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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS (ACRS)

533rd MEETING

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WEDNESDAY, MAY 31, 2006

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ROCKVILLE, MARYLAND

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The Subcommittee met in Room T2B1 at Two White Flint North, 11555 Rockville Pike, Rockville, Maryland, at 8:30 a.m., Graham B. Wallis, Subcommittee Chair, presiding.

MEMBERS PRESENT:

- GRAHAM B. WALLIS Chairman
- WILLIAM J. SHACK Vice Chairman
- GEORGE E. APOSTOLAKIS Member
- J. SAM ARMIJO Member
- MARIO V. BONACA Member
- RICHARD S. DENNING Member
- THOMAS S. KRESS Member
- OTTO L. MAYNARD Member
- JOHN D. SIEBER ACRS Member-At-Large
- JOHN LARKINS Designated Federal Official

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1       ACRS STAFF PRESENT:

2       HANS ASHAR                   NRR

3       DANIEL FRUMKIN               NRR

4       ALEX KLEIN                    NRR

5       THOMAS KOSHY                EEEEB/DE/NRR

6       MICHAEL MAYFIELD            DE/NRR

7       GEORGE MORRIS               EEBE/DE/NRR

8       LINH TRANS                   NRR

9       GEORGE WILSON               NRR

10      ROBERT WOLFGANG            NRR

11      ROY WOODS                    RES

12

13      ALSO PRESENT:

14      HAROLD BARRETT             Duke Power Company

15      MIKE FALLON                 Constellation Energy

16      ALEX MARRION               NEI

17      DAVID MISKIEWICZ          Progress Energy

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AGENDA ITEMS

PAGE

Opening Remarks, Chairman Graham B. Wallis . . . 4

Draft Final Generic Letter, "Post-Fire  
Safe-Shutdown Circuit Analysis  
Spurious Actuations" . . . . . 5

Draft Final Generic Letter 2006-XX,  
"Inaccessible or Underground Cable  
Failures that Disable Accident  
Mitigation Systems" . . . . . 149

Interim Staff Guidance on Aging Management  
Program for Inaccessible Areas of Boiling  
Water Reactor (BWR) Mark I Containment  
Drywall Shell . . . . . 195

Adjournment

## P R O C E E D I N G S

(8:31 a.m.)

CHAIRMAN WALLIS: The meeting will now come to order.

This is the first day of the 533rd meeting of the Advisory Committee on Reactor Safeguards. During today's meeting, the Committee will consider the following:

Draft Final Generic Letter, Post-Fire Safe-Shutdown Circuit Analysis Spurious Actuations, Draft Final General Letter, Inaccessible or Underground Cable Failures that Disable Accident Mitigation Systems, Interim Staff Guidance on Aging Management Program for Inaccessible Areas of Boiling Water Reactor Mark I Containment Drywell Shell, and Preparation of ACRS reports.

This meeting is being conducted in accordance with the provisions of the Federal Advisory Committee Act. Dr. John T. Larkins is the Designated Federal Official for the initial portion of the meeting.

We have received no written comments from members of the public regarding today's sessions. We have received a request from Alex Marrion, NEI, for time to make oral statements regarding the Generic

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1 Letter on Post-Fire Safe-Shutdown Circuit Analysis and  
2 the Generic Letter on Inaccessible or Underground  
3 Cable Failures that Disable Accident Mitigation  
4 Systems.

5 A transcript of portions of the meeting is  
6 being kept and it is requested that the speakers use  
7 one of the microphones, identify themselves, and speak  
8 with sufficient clarity and volume so that they can be  
9 readily heard.

10 I will begin with some items of current  
11 interest. In the items handed out to you, I notice  
12 that there is a speech by Commissioner Yatzko at the  
13 beginning. And at the end, there is an interesting  
14 article on various matters which complicate PWR sump  
15 evaluations.

16 Now in the middle of the day, we are going  
17 to have ethics training which is why the lunch break  
18 is so long today. And the ethics training is  
19 scheduled for between 12:15 and 1:30 so you should be  
20 here at 12:15 and ready to be trained in ethics.

21 That is the end of my prepared remarks.  
22 And I'd like to proceed with the meeting. Call on  
23 Rich Denning to get us started on the first item.

24 MEMBER DENNING: Thank you. We will be  
25 hearing from the staff regarding the draft final

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1 generic letter 2006-XX, Post-Fire Safety-Shutdown  
2 Circuit Analysis Spurious Actuations. The Committee  
3 will hear presentations by and hold discussion with  
4 representatives of the staff.

5 Additionally, Mr. Alex Marrion with NEI,  
6 has requested ten minutes to share NEI's perspective  
7 after the staff's presentation.

8 The Committee had requested to review the  
9 generic letter regarding Post-Fire Safe-Shutdown  
10 Circuit Analysis Spurious Actuations after the public  
11 comment period. We did not have a prior subcommittee  
12 meeting on this letter which may have been a mistake.

13 I have serious reservations about the  
14 balance between regulatory burden and approved safety  
15 associated with this letter. The letter leaves open  
16 options for risk informing this process but they are  
17 not easy activities to perform. So we are anxious to  
18 hear what the staff has to say on this. And to have  
19 a healthy discussion, I believe.

20 We have a considerable period of time  
21 actually to do this, three hours. But I think that we  
22 will want to look into this letter very carefully  
23 before giving our blessing.

24 I think we are now ready to hear from  
25 staff. And I'll turn it over to Alex Klein of the

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1 Office of Nuclear Reactor Regulation.

2 MR. KLEIN: Thank you very much. My name  
3 is Alex Klein. You see on the cover slide here my  
4 branch chief's name, Sunil Weekakkody. He extends his  
5 regrets for not being able to attend today's meeting  
6 in that he had a prior commitment for jury duty today.  
7 With that, I'm acting in his place so I will give the  
8 opening presentation.

9 The purpose of today's meeting and the  
10 presentation to the Committee is to present the final  
11 draft of Generic Letter 2006-XX, Post-Fire Safe-  
12 Shutdown Circuit Analysis Spurious Actuations. We are  
13 also here to obtain ACRS endorsement to issue the  
14 proposed generic letter.

15 I'd like to introduce the two primary  
16 staff members who will present today for NRR. To my  
17 left is Robert Wolfgang who is the primary author of  
18 the generic letter. And to my right is Daniel  
19 Frumkin, fire protection engineer, from the Office of  
20 NRR, who will speak to you about some of the NEI and  
21 EPRI fire testing.

22 We also have in the audience with us  
23 supporting staff members from NRR who were also  
24 instrumental in the development of this generic  
25 letter.

1           As an overview, I wanted to advise the  
2           Committee that there is a lot of history leading up to  
3           this generic letter. And you will hear some of this  
4           today. We did a bounding analysis, full of risk. We  
5           also did a regulatory analysis of the generic letter.  
6           But at this time, those slides are not in our  
7           presentation. But we are certainly prepared to  
8           discuss those aspects.

9           MEMBER DENNING: We absolutely would like  
10          to see those slides.

11          MR. KLEIN: Very good.

12          So the probability of spurious actuations  
13          due to fires will be presented by Dan Frumkin after I  
14          speak. And then after Dan speaks, we will receive a  
15          summary of the objectives of the generic letter by Bob  
16          Wolfgang.

17          Again, based upon the long history of this  
18          generic letter and so forth, there has been differing  
19          views between the industry and the NRC on the  
20          credibility of multiple spurious actuations. You will  
21          hear about the NEI/EPRI cable fire test results from  
22          Dan Frumkin, as I indicated.

23          I also wanted to indicate to the Committee  
24          that we are continuing with our inspections using  
25          risk-informed aspects. For example, RIS 2004-03,

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1 certainly one of the goals of issuing this generic  
2 letter is to reestablish compliance with the  
3 regulations.

4 That concludes my introductory remarks.  
5 And I'll hand over the presentation to Dan Frumkin.

6 CHAIRMAN WALLIS: When you present, could  
7 you make it clear to me just what it is you are asking  
8 industry to do because I had a lot of trouble figuring  
9 that out. There is a lot of sort of rather vague  
10 requirements it seems to me. And perhaps you can in  
11 your presentation make it clear just what it is they  
12 have to do.

13 MR. KLEIN: Yes.

14 MR. FRUMKIN: Good morning. My name is  
15 Dan Frumkin from the Office of NRR. I work for Sunil.  
16 And today I'm going to present some of the background  
17 from the NEI/EPRI testing that is discussed in the  
18 generic letter.

19 I see some new faces around the ACRS table  
20 so I'm going to pass around some tables from some  
21 testing that occurred. At the end of the cables that  
22 are fused together, you will be able to see two  
23 failure modes or examples of two failure modes. One  
24 is an inter-cable which is two cables -- or actually  
25 one is an intra-cable, which we use these terms intra

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1 within a single cable and inter between two separate  
2 cables. And this provides an example of both.

3 The highlighted portions within a cable  
4 are very close together that have failed together.  
5 And then we also have intruding cable that has  
6 penetrated the outer jacket and apparently the inner  
7 cable protection and come at least into very close  
8 contact which you can see.

9 We will talk also about the different  
10 types of cable. This is a thermal plastic cable,  
11 which is the more vulnerable cable, but as you can  
12 see, that it is subject to both failures from internal  
13 and external cables when put under the suitable heat  
14 or fire exposure.

15 So I'll be providing some background on  
16 the testing that provided the insight into the failure  
17 likelihoods, the objectives of that testing, some  
18 details of the testing, some of the test results, and  
19 a few conclusions based on the testing.

20 And then Mr. Wolfgang will be talking  
21 about the generic letter more specifically.

22 The NEI/EPRI testing was intended to  
23 address fire-induced circuit failure issues of concern  
24 to the NRC staff, principally the potential for  
25 spurious operations of equipment.

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1           This was intended to basically bring to  
2 close the question that the staff kept on bringing up  
3 that Browns Ferry had these and the industry said that  
4 well, it is very unlikely to occur. So this was  
5 intended to bring that to a close.

6           NRC witnessed the testing and also did  
7 some insulation resistant testing using Sandia  
8 National Laboratory resources.

9           And there are four documents that either  
10 in whole or in part document the results of some of  
11 the testing. The characterization of fire-induced  
12 circuit failures results is the big report from EPRI.

13           The circuit analysis failure modes and  
14 likelihood analysis is the Sandia Report of their  
15 insulation resistant testing.

16           These results were pulled into the NUREG  
17 6850, which is the fire protection re-quantification  
18 or the fire PRA methodology for nuclear power  
19 facilities. This is the state-of-the-art document  
20 that Research has developed to -- it is a handbook on  
21 how to do fire PRA.

22           And then there was the spurious actuation  
23 expert elicitation which was experts reviewing the  
24 testing and coming up with results.

25           The objectives, as I said, was to research

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1 the characteristics of fire-induced circuit failures  
2 to better understand these plants' responses to cable  
3 failures. And, as I said, the NRC also was involved  
4 in the testing and reviewed -- witnessed the testing  
5 and did their own insulation resistant testing.

6 So the details of the test, there were 18  
7 fire tests that were conducted between January 9th,  
8 2001 and June 1st, 2001 at the Omega Point  
9 Laboratories in San Antonio. And the three types of  
10 fire exposures were tested during the test. The hot  
11 gas layer region which is up at the ceiling level, the  
12 fire creates a buoyant plume and it fills the  
13 enclosure from the top down. And that is the hot gas  
14 layer.

15 Then below -- between the fire -- the  
16 actual fire and the hot gas layer is what we call the  
17 plume region where there is no flaming but that is a  
18 very hot part of the -- that is the hottest part of  
19 the smoke region of the fire.

20 And they also tested a radiant exposure  
21 where you get close to the fire itself or sometimes  
22 worst case could be up next to the plume region  
23 depending on emissivity of the smoke and the radiant  
24 energy coming off. If it is a clean burning flame, it  
25 may not have a high radiant energy but the smoke may

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1 be higher. So -- but they just used, I believe, a  
2 fixed radiant number but that is a little discussion  
3 of the radiant energy.

4 One thing that they didn't do that I will  
5 add is they did not put cables in the flaming region.  
6 That is why I have this highlighted. We, the staff,  
7 hear a lot from the licensees about how long it takes  
8 to have these cables fail. And that there is plenty  
9 of time in all situations for mitigation.

10 And based on the testing, yes, in a lot of  
11 the testing there was a lot of time before there was  
12 failure in, you know, 30, 40 minutes for some of the  
13 tests. But none of the tests tested this flaming  
14 region.

15 So this leaves the staff a very strong  
16 question of how fast -- well, first we don't know what  
17 failures will occur in that region. They could occur.  
18 They may not occur. We don't have the information.

19 It is very clear that if they do occur,  
20 they will occur much more quickly. The temperatures  
21 are over, you know, much -- a thousand degrees hotter  
22 in the flaming region. And there is also an ignition  
23 source. So it is a very different phenomenon. And  
24 cables could be exposed to a flaming region in the  
25 plant.

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1           So this test is not a complete picture of  
2           -- or let me just say that the timing factors that  
3           came out of the testing that was done are not a  
4           complete picture of the possible scenarios that could  
5           occur.

6           MEMBER APOSTOLAKIS: It appears that you  
7           were participating in the conduct of these tests. Did  
8           you express these concerns to EPRI when they were  
9           designing the tests?

10          MR. FRUMKIN: Well, I wasn't specifically  
11          involved in that. I don't believe that the test was  
12          intended to develop timing. And as such, it wouldn't  
13          have been an issue. The licensees or the industry has  
14          brought this timing issue and perhaps inappropriately  
15          based on the testing.

16          It is useful to heat this cable slowly  
17          because then the hot shorts would probably exist for  
18          a longer period of time. But whether this -- but my  
19          only point is that I don't believe that this testing  
20          provides a basis to say that hot shorts -- this test  
21          I don't think was intended or can provide a basis for  
22          timing. But I believe it is being applied or some  
23          intend to use it to show that there is a timing issue.

24          MEMBER APOSTOLAKIS: I would be such an  
25          obvious thing to do. I mean there must be a reason

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1 why they didn't do it. Do you know that? Or should  
2 we ask Mr. Marrion when he comes?

3 MR. FRUMKIN: Why they didn't do the  
4 flaming region? Yes, that is a fair question. But I  
5 believe the answer -- like I said, I do think that  
6 that was not -- if there hadn't been any failures  
7 outside of flaming region, I think there would have  
8 been a strong feeling that failures in the flaming  
9 region would have been maybe less likely. But it is  
10 a fair question.

11 MEMBER APOSTOLAKIS: Okay.

12 CHAIRMAN WALLIS: Does the material from  
13 which the insulation is made, does that actually burn  
14 at some temperature?

15 MR. FRUMKIN: Yes.

16 CHAIRMAN WALLIS: But if you stuck it in  
17 a flame, you would expect the insulation itself to  
18 catch fire.

19 MR. FRUMKIN: Yes. The ASTM -- or, I'm  
20 sorry, the IEEE 383 fire test that has been the  
21 standard fire test is actually a burning test. And it  
22 ignites the flames from the bottom in a vertical cable  
23 tray. And all the cables do catch on fire when  
24 exposed to flame. But some of them propagate more or  
25 less slowly.

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1           There are some specialized cables that  
2 don't catch on fire but those were not tested. Those  
3 aren't what we are talking about here.

4           So the results of the tests showed with  
5 some confidence that failures within multi-conductor  
6 cables are likely and when they do occur, they occur  
7 in multiple conductors within the same multiple  
8 conductor cable. So as you can see from that cable  
9 bundle, there may actually be more than one cable  
10 conductor within the cable further down the jacket  
11 that you can't see.

12           And then the way they are spiraled  
13 together in there so that various cables could come in  
14 contact with other cables within the same cable.  
15 Various conductors could come into contact with other  
16 conductors within the same cable.

17           In addition, multiple devices were shown  
18 -- the spurious actuation data showed that a single  
19 hot short within a multi-conductor cable usually  
20 effected actuation devices simultaneously. If there  
21 were two devices -- I believe the way they set this  
22 test up is they wanted a very practical approach.

23           So they actually put -- rather than doing  
24 similar to the Sandia testing where they used an  
25 insulation-resistance device, they used actual plant

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1 equipment, which they just plugged it in as they would  
2 in the plant and if it would actuate or not actuate.  
3 So it was a real pragmatic thing and they did actuate.  
4 And as the testing showed, some actuated  
5 simultaneously.

6 MEMBER MAYNARD: Did they also measure how  
7 long the signal stayed there? Or how long it  
8 actuated?

9 MR. FRUMKIN: Yes. And most of the hot  
10 shorts were of a short duration. And some were in the  
11 order of minutes, I believe.

12 This is a table of results of the best  
13 estimates given cable damage of a spurious actuation  
14 probability. And the purpose of this table is not to  
15 -- the purpose of this table is just to show that the  
16 NRC and the industry -- or at least the results from  
17 the EPRI report which was developed by industry, are  
18 very consistent.

19 The staff and the risk people in industry  
20 really are on the same page with the likelihood of  
21 spurious actuations. There are some factors of two  
22 here, differences, but in probabilistic and  
23 likelihoods, in that world it is a small difference.

24 CHAIRMAN WALLIS: This is strange to me.  
25 It must depend on the extent of the damage. I mean if

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1 you just burn a cable for a short time, nothing  
2 happens. If you burn it for long enough, you are  
3 going to get shorts. So you can't just have a  
4 probability. It is going to depend on the extent of  
5 the damage to the cable.

6 MR. FRUMKIN: Yes. In all these, cables  
7 were exposed to damage. So this is given that these  
8 cables were damaged.

9 CHAIRMAN WALLIS: But to what extent?

10 MEMBER APOSTOLAKIS: It is a critical  
11 probability. I mean -- or, as you said earlier --

12 PARTICIPANT: At some point the  
13 probability is one, right?

14 MEMBER APOSTOLAKIS: I mean there is a 0.6  
15 conditional probability that you will have a spurious  
16 actuation. This is conditional on the probability  
17 that the cable is damaged.

18 MR. FRUMKIN: Correct.

19 MEMBER APOSTOLAKIS: And what is that?

20 MR. FRUMKIN: That depends on the  
21 scenario. For example, if a cable is a foot above a  
22 piece of switch gear or let's say -- and this is not  
23 an unlikely situation -- a foot above 20 or 30 feet of  
24 switchgear. It runs across the cable tray, across the  
25 top of a number of pieces of switchgear, what is the

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1 probability?

2 Well, that could be calculated typically,  
3 I think, a single piece of switchgear is five times E  
4 to the minus five. Or, you know, in that range. But  
5 then it certainly would be damaged if there was even  
6 a small fire in that piece of switchgear.

7 So there is -- you could have cable -- and  
8 then that same cable does go through different areas  
9 where it could be exposed to different other fires.  
10 A single cable could go through three, four, five  
11 different areas and be exposed to a dozen different  
12 fire scenarios.

13 MEMBER DENNING: I think we have to  
14 recognize the context within which this is done,  
15 George. And I think it is important when we try to  
16 get into the question of risk informing this and that  
17 is basically we are doing a deterministic safe  
18 shutdown analysis in which you assume there is a fire  
19 in a zone -- in a fire area. And it can burn there  
20 for three hours. You know even though there are other  
21 mitigating things that would clear that, we assume it  
22 can burn for three hours.

23 So then the question is well, with this  
24 massive potential exposure, then you have got a cable  
25 running through there. What's the potential that it

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1 could then be heated up to a point at which you get  
2 this kind of interaction? You know it doesn't get at  
3 all into the questions of you have a fire in a room,  
4 what is the possibility that any cables are exposed,  
5 you know, before it is controlled.

6 MEMBER APOSTOLAKIS: But if we are doing  
7 a deterministic analysis, why are we calculated  
8 spurious actuation probabilities?

9 MEMBER DENNING: Well, let me give my view  
10 but I'd certainly like to hear your view, and that is  
11 that the question is not so much whether you can have  
12 spurious actuations but how many can you have? How  
13 many combinations of things can you deal with?

14 The industry has always agreed to looking  
15 at a spurious actuation on a one-at-a-time basis, you  
16 know. And so I think that what the staff is trying to  
17 do is to give the feeling that -- or their impression  
18 that this isn't the really rare event -- the extremely  
19 rare event that actually would have some kind of  
20 spurious actuation occurring.

21 And then I think by implication then maybe  
22 there is the potential for multiple spurious  
23 activations.

24 MEMBER APOSTOLAKIS: Well, the second  
25 bullet of the previous slide, I guess, is then the

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1 key, right? Is that what -- of devices?

2 MEMBER DENNING: Well, I would be curious.  
3 What is your -- if you were answering that question,  
4 how would you have answered George's question? Why  
5 are we looking at probabilities here now?

6 MR. FRUMKIN: Well, okay, maybe this slide  
7 was poorly planned. But the point of the slide is  
8 twofold. One is to say that with regard to  
9 probabilities, the staff and the industry people who  
10 do this work are on the same page.

11 And the second reason, I guess, is to show  
12 that these probabilities are very high in  
13 probabilistic space, that some of them are close --  
14 you know, 0.6, and then if you have a 0.6 scenario and  
15 you have two 0.6 scenarios, you've got a 0.36  
16 scenario. So that even multiple can be a fairly high  
17 probable.

18 MEMBER DENNING: Now help us though -- you  
19 can't say that without giving some conditionality of  
20 --

21 MR. FRUMKIN: Right.

22 MEMBER DENNING: -- 0.6 conditions on  
23 what?

24 MR. FRUMKIN: Cable damage.

25 MEMBER DENNING: Cable damage.

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1                   MEMBER ARMIJO: I have a problem with  
2 cable damage. Is this severe? Moderate? I have no  
3 feeling of -- I can see where all the insulation is  
4 burnt to a crisp and I would call that severe.  
5 Wouldn't these probabilities all be one?

6                   MR. FRUMKIN: No. Well, okay, so what  
7 this is talking about is the spurious actuation  
8 probability, not shorting situation. This is the  
9 likelihood of a hot short occurring within a cable  
10 without that cable shorting to its conduit or cable  
11 tray because generally once the hot conductors fail to  
12 the conduit or cable tray or the nearest ground, then  
13 they would certainly -- that would clear the spurious  
14 actuation.

15                  MEMBER MAYNARD: Okay. But I think there  
16 is a high probability if you make all the assumptions  
17 to get to this point. But you also have to factor in  
18 the probability of actually having a fire, for the  
19 fire going that long, for the operators not taking any  
20 action. There are a lot of other things getting up to  
21 that point that when you put it all in context --

22                  MEMBER APOSTOLAKIS: That is why I'm  
23 confused. We are either doing deterministic analysis  
24 or we are doing risk analysis. If we do risk  
25 analysis, then, of course, we have to do all this. If

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1 we do what Rich said, then it seems to me they are  
2 gone.

3 I mean you have three hours. Everybody is  
4 burning, right? I think as I recall from the early  
5 studies on this the real question is whether you will  
6 have a short -- a hot short first before an open  
7 circuit.

8 MR. FRUMKIN: Right. Before the short  
9 ground.

10 MEMBER APOSTOLAKIS: That is the critical  
11 thing.

12 MR. FRUMKIN: Yes.

13 MEMBER APOSTOLAKIS: And this is not  
14 answering that, is it?

15 MR. FRUMKIN: Yes, it is.

16 MEMBER APOSTOLAKIS: It is?

17 MR. FRUMKIN: This is the likelihood of  
18 that spurious actuation probability, not a short to  
19 ground.

20 MEMBER APOSTOLAKIS: Okay.

21 CHAIRMAN WALLIS: This is one spurious  
22 actuation.

23 MR. FRUMKIN: This is a single.

24 CHAIRMAN WALLIS: A single one although  
25 there are multiple wires in the cable?

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1 MR. FRUMKIN: Right. Well, this is a  
2 spurious actuation getting cable to damage within a  
3 cable or between -- there is an inter-cable factors  
4 here -- between two cables. So the point -- let's  
5 just say the 0.6 here is for within a single thermoset  
6 cable, the 0.2 or the 0.4, as the 6850 has it, is  
7 between -- or generally it is 0.3 is what has been  
8 used a lot -- is between two separate thermoset cables  
9 within the same tray.

10 And what the previous slide was trying to  
11 say is that within a single thermoset -- within a  
12 single multi-conductor cable, that more than one of  
13 the conductors are going to fail together with an 80  
14 percent likelihood. So it almost for sure that if  
15 let's say you have one hot conductor and four control  
16 conductors that could actuate four different pieces of  
17 equipment, that hot conductor will come into contact  
18 probably with all of them with the same likelihood,  
19 with this same 0.6.

20 CHAIRMAN WALLIS: Oh, with the same  
21 likelihood?

22 MR. FRUMKIN: Yes. It's not a 0.6 times  
23 0.6 times 0.6 in the same cable. Within that cable it  
24 is 0.6 times 0.8, if you will.

25 CHAIRMAN WALLIS: Okay.

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1 MR. FRUMKIN: So it is still -- it is  
2 almost 0.6.

3 MEMBER DENNING: Why are the inter-cable  
4 probabilities the same for thermal plastic and  
5 thermoset?

6 MR. FRUMKIN: Because -- oh, you mean this  
7 and this?

8 MEMBER DENNING: Yes.

9 MR. FRUMKIN: Inter-cable -- yes, I'm not  
10 -- that's just a -- well, intra-cable is very likely  
11 --

12 MEMBER DENNING: Intra-cable, I understand  
13 that.

14 MR. FRUMKIN: Yes, I don't -- I don't have  
15 --

16 CHAIRMAN WALLIS: What is the question,  
17 Rich?

18 MEMBER DENNING: It's thermoset is less  
19 likely -- one would think thermoset would be less  
20 likely to have inter-cable and perhaps they are the  
21 same here because there just haven't been any  
22 experiments done on a thermoset.

23 MR. FRUMKIN: I think that is it because  
24 you can see that that is one of the big differences,  
25 a factor of two here, and again the same factor of two

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1 for intra-cable -- inter-cable -- but yes, we're -- as  
2 Roy Woods is here, and we're doing more testing on  
3 this. But this is currently the state-of-the-art data  
4 on this.

5 And I can't explain the -- it's just that  
6 is what the data showed from the limited 18 tests.

7 CHAIRMAN WALLIS: Now we are talking about  
8 whether you are doing probabilistic or deterministic  
9 analysis. When we get to the generic letter, there  
10 are strange terms such as saying the licensee must  
11 assume the possibility of simultaneous multiple  
12 spurious actuation -- well that tells me nothing.

13 I'm assuming the possibility -- it says  
14 nothing about whether it is likely to be one or 0.6 or  
15 whatever.

16 MEMBER DENNING: What they are saying is  
17 one.

18 CHAIRMAN WALLIS: What does it mean?

19 MEMBER DENNING: It means one.

20 CHAIRMAN WALLIS: So possibility means a  
21 probability of one?

22 MEMBER DENNING: That's -- yes.

23 CHAIRMAN WALLIS: That wasn't clear to me  
24 at all. Okay.

25 MEMBER APOSTOLAKIS: We will come to the

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1 letter, I guess.

2 MEMBER DENNING: Yes. Continue.

3 MR. FRUMKIN: These are just some notes on  
4 the previous slide that some of the plants that use  
5 the CPTs, which are the control power transformers,  
6 that reduces the likelihood of spurious actuations.

7 MEMBER APOSTOLAKIS: All of these  
8 probabilities, of course, mean nothing now.

9 MR. FRUMKIN: Right, yes.

10 MEMBER APOSTOLAKIS: They are one.

11 MR. FRUMKIN: Okay. Well --

12 MEMBER DENNING: But we are going to get  
13 to risk informing at some point here.

14 MR. FRUMKIN: Absolutely. Right. So  
15 those were just notes on the previous slide which was  
16 unfortunately put in here.

17 In conclusion, a review of the test data  
18 readily illustrates that hot shorts often involve more  
19 than one conductor. And that concurrent hot shorts  
20 within a cable are probable and should be considered  
21 during circuit analysis.

22 That's the end of this presentation. And  
23 the point of this is just to lay the groundwork that  
24 simultaneous spurious actuations and simultaneous  
25 multiple spurious actuations have been shown by

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1 testing, by industry testing, to occur.

2 MEMBER DENNING: Now there is more testing  
3 that is in progress. It is your feeling that that  
4 testing could then -- will it be done within a time  
5 period where we add value to the licensee when the  
6 licensee is basically responding the generic letter?

7 MR. FRUMKIN: Yes, that testing is planned  
8 to be done by the end of the year. And that pool of  
9 data will be available -- certainly for risk-informed  
10 evaluations for the licensees to use. But the experts  
11 doing the testing don't believe that there is going to  
12 be -- they believe these numbers are going to be  
13 honed.

14 They believe that there are going to be  
15 more cable combinations tested here than in the 18  
16 EPRI tests -- EPRI/NEI tests. But they don't believe  
17 that for the information that was on that table are  
18 going to be changed by an order of magnitude. It's  
19 maybe a 50 percent change or something of that nature.

20 MEMBER DENNING: If we have time later on,  
21 could we have a short presentation by someone about  
22 what is still to happen? And what different  
23 configurations basically have been untested at this  
24 point that will be tested?

25 MR. FRUMKIN: Well, Roy Woods is sitting

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1 behind you. And I'm not sure if he is prepared to  
2 talk about this testing.

3 MEMBER DENNING: Let me say I'm not asking  
4 for you to do it right now. But do you think you  
5 could do it later?

6 MR. WOODS: Sure. Roy Woods, RES. Yes,  
7 certainly we can make a presentation to you whenever  
8 you want on the testing. The plans are well made. We  
9 are about to start within days or a week at most. It  
10 is actually about to happen.

11 MEMBER DENNING: Okay. Well, let's go  
12 ahead --

13 MR. FRUMKIN: I think they want something  
14 later this morning, right?

15 MEMBER DENNING: Yes, later this morning.  
16 Absolutely, yes. Later this morning.

17 MEMBER APOSTOLAKIS: That's what happens  
18 when you have three hours.

19 MEMBER DENNING: Right, yes. Thanks. Can  
20 you run any of those tests by eleven?

21 MR. WOLFGANG: My name is Bob Wolfgang.  
22 I'm a fire protection engineer in NRR. And I'm going  
23 to give you information on the draft generic letter  
24 Post-Fire Safe-Shutdown Circuit Analysis Spurious  
25 Actuations.

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1           A summary of the presentation, I'll go  
2 over the purpose of issuing the generic letter, the  
3 information we are requesting from licensees, the  
4 background on this issue since 1997, the basis for the  
5 generic letter, the issue that is clarified in the  
6 generic letter, public comments, and a summary at the  
7 end.

8           The purpose of issuing the generic letter  
9 is to clarify how the NEI/EPRI cable fire test program  
10 reaffirms long-held regulatory positions and provide  
11 part of a foundation for licensees who are planning to  
12 transition to NFPA 805.

13           Also, to respond to the Agency's need to  
14 provide clarification and closure of outstanding fire  
15 protection issues, respond to --

16           MEMBER APOSTOLAKIS: Excuse me. Are you  
17 going to come back to these? I mean this on slide 16,  
18 the foundation for licensees planning to transition,  
19 will you elaborate on these later? Or can you tell us  
20 a few words now?

21           MR. WOLFGANG: Well, that's --

22           MEMBER APOSTOLAKIS: Why is that relative  
23 to NFPA 805?

24           MR. WOLFGANG: This is just to show that  
25 multiple spurious actuations should be included in

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1 their risk analysis model.

2 MEMBER DENNING: Well, since George has  
3 raised the question, let me ask it now. And that is  
4 NFPA 805 is one of the ways -- transitioning to NFPA  
5 805 is one of the ways that a licensee can respond to  
6 this. Now my question is how long does it take to  
7 transition to NFPA 805?

8 And I don't quite understanding within the  
9 time periods of the 90 days and six months and this  
10 kind of stuff, within the context of a transition to  
11 NFPA 805, when did that transition actually have to  
12 occur for the licensee to be able to use that pathway?

13 MR. WOLFGANG: All they have to do is  
14 respond to us within I believe it is the 90 days.  
15 That they are transiting to NFPA 805. And they will  
16 take care of this situation during that process.

17 MEMBER DENNING: Then how long would they  
18 have to transition to NFPA 805?

19 MR. WOLFGANG: They have -- what is it?  
20 Is it three years?

21 PARTICIPANT: Three years.

22 MEMBER DENNING: Three years?

23 MEMBER APOSTOLAKIS: Yes, it is a long  
24 time.

25 MR. KLEIN: Let me describe briefly. This

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1 is Alex Klein. Let me briefly describe the process a  
2 licensee would use if he wants to transition to NFPA  
3 805. And that is once the licensee had made the  
4 determination that he does want to transition to 805  
5 because that is an option for him, if he submits a  
6 letter of intent to the agency indicating that that is  
7 what he wishes to do.

8 At that point, we review that letter and  
9 make a determination as to whether or not the schedule  
10 that the licensee has laid out is acceptable to the  
11 Agency. And what we have right now in place is a  
12 three-year time frame for licensees to transition with  
13 the option of extending that time frame if the  
14 licensee can provide us with sufficient justifications  
15 beyond the three-year time period.

16 Now within that three-year time period, a  
17 licensee would submit their letter of intend, do the  
18 act of transition into NFPA 805. And then before that  
19 three-year time period is over, we would submit their  
20 license amendment to the staff for our review and  
21 approval prior to them actually receiving the  
22 amendment.

23 MEMBER APOSTOLAKIS: It seems to me that  
24 the -- actually is the first bullet in the previous  
25 slide that is important because the licensee that

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1 wants to transition to NFPA 805 has to convince you,  
2 I think, that they complied with all the regulations,  
3 right? There may be a few exceptions, as I remember  
4 for a period of time, and all that.

5 So the primary reason seems to be to  
6 reaffirm long-held regulatory positions because  
7 somebody who wants to transition has to demonstrate  
8 that they complied with all that.

9 MR. KLEIN: That is correct. Really I  
10 think the primary purpose of the generic letter is  
11 that first bullet on that slide 16.

12 MEMBER APOSTOLAKIS: Right, right.

13 MR. KLEIN: Yes. As an added benefit, it  
14 does provide the foundation for licensees who want to  
15 transition to 805.

16 MEMBER DENNING: Now wait a second. I  
17 definitely did not understand this. I mean clearly  
18 there are a lot of licensees out there that did not --  
19 cannot respond to multiple spurious actuations. And  
20 they are not going to have to bring their plant into  
21 compliance with having to meet all the multiple  
22 spurious actuations before going to NFPA 805 because  
23 then NFPA 805 doesn't help them at all, right?

24 MR. FRUMKIN: Yes, that is correct. And  
25 what Dr. Apostolakis was saying is correct is that we

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1 have an enforcement discretion in place so those  
2 licensees who discover during transitions that they  
3 are not in compliance can do a risk analysis of that  
4 and determine that it is not red, that it is not  
5 wilful, that it is not a severity one violation.

6 And, therefore, they can comp it -- put  
7 compensatory actions in place and move forward towards  
8 transition without necessarily correcting that in  
9 accordance with the old fire protection program.

10 MEMBER DENNING: But one thing that I  
11 think is an issue though and that is suppose there is  
12 a plant out there that would really like to do the  
13 NFPA 805 approach but within the 90-day period, don't  
14 they have to go through the entire analysis and  
15 identify the SSCs that are potentially vulnerable  
16 based upon this detailed multiple spurious actuation  
17 evaluation which seems to me like an extremely  
18 difficult problem to undertake.

19 Is that true that they have to really  
20 analyze the whole system within 90 days according to  
21 this multiple spurious actuations and identify  
22 vulnerable SSCs? Am I correct or not correct?

23 MR. WOLFGANG: Well, they have to -- well,  
24 I'll get to that on a slide here.

25 MEMBER DENNING: Okay, if you will get to

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1 it, you can go ahead.

2 MEMBER MAYNARD: I would like to challenge  
3 that first statement just a little bit though. And I  
4 know that it has been a long-held position by members  
5 of the staff but as far as, you know, NRC position,  
6 there are a number of licenses that were issued and  
7 plants inspected and with their programs were approved  
8 and licensed without making this assumption.

9 And I'm not convinced that it has clearly  
10 been a recognized regulatory requirement. And again,  
11 I know licenses were issued, programs were reviewed  
12 without making -- otherwise, we wouldn't even be here  
13 today if those licenses weren't issued at that time.  
14 So I would challenge that. The first statement.

15 MR. WOLFGANG: We know SERs have been  
16 issued for Byron and Braidwood with a single spurious  
17 actuation per fire event. And we've come to the  
18 conclusion basically that was issued as a mistake.  
19 That was a mistake.

20 MEMBER MAYNARD: But I know that there are  
21 a lot of plants out there a license. Their analysis  
22 were reviewed, their programs were reviewed. I know  
23 I was personally involved with them back in the '80s  
24 when some of these issues were starting to come to a  
25 highlight. And I know that there are a number of

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1 plants out there with licenses that although it may  
2 not be documented as clearly, that it was known that  
3 multiple spurious actuations were not taken in account  
4 in that analysis.

5 I don't think it is clear that this is  
6 just confirming compliance to requirements that were  
7 in place. I think it is a different set of  
8 assumptions.

9 MR. FRUMKIN: Yes, and this may, I agree  
10 that your assumptions apply to probably a number of  
11 plants out there. But for the most part, Appendix R,  
12 10 CFR 50, Appendix R, Section 3(g)(ii) and 3(g)(ii)  
13 which is the alternate and dedicated shutdown are what  
14 is in question.

15 The NRC went in and did an analysis of the  
16 3(g)(iii) alternate shutdown. And for a lot of  
17 3(g)(iii) which is, for lack of a better description,  
18 a control room abandonment, they allowed the  
19 assumption of one spurious actuation. 3(g)(ii) wasn't  
20 across the board inspected in the 80s. It was assumed  
21 that licensees could wrap or protect or would have  
22 adequate separation.

23 And it wasn't evaluated for multiple  
24 spurious because generally the staff didn't believe  
25 that -- well, I'm not sure why they didn't do it. But

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1 the big question was this alternate shutdown.

2 And in the 90s, we had the thermal lag.

3 And a lot of that wrap was taken out. And a lot of  
4 manual actions or assumptions were put into place.

5 And I don't mean to say that there was -- well, the  
6 point that I am trying to make is that there was  
7 another change. There was the removal of a lot of  
8 these thermal lag which was relied on to protect  
9 cables and probably would have mitigated many spurious  
10 actuations, many multiple spurious.

11 MEMBER MAYNARD: And I'm not saying at  
12 this point that they shouldn't be considered now. I'm  
13 challenging the regulatory positions that says all  
14 along everybody should have always done this. I think  
15 that, you know, we're now setting, you know, these are  
16 the things that definitely need to be considered.

17 If those were considered 20, 30 years ago,  
18 if that was part of the regulatory position for the  
19 licenses, we wouldn't have gone through a 20-year  
20 period here of trying to figure out what it really  
21 requires the licensee to do. Again, it's a regulatory  
22 -- I believe that this is something that falls within  
23 the backfit.

24 It needs a better analysis overall. And  
25 that doesn't mean that it is a bad thing to do. I'm

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1 just saying that I do not believe that we can take the  
2 position that this is a requirement that has already  
3 been there, that everybody should have already done.  
4 And that is kind of what we are saying in this generic  
5 letter.

6 MR. KLEIN: This is Alex Klein of NRR. I  
7 just wanted to add to the discussion here that -- and  
8 Bob can clarify this also for me -- is that the  
9 generic letter did receive CRGR approval. We did go  
10 to that Committee.

11 There are subsequent slides in Bob's  
12 presentation, I think 23, 24, 25, that does talk  
13 about the background, the regulatory background that  
14 you are speaking of that might clarify some of these  
15 discussion questions.

16 MEMBER MAYNARD: I'd be glad to look at  
17 that.

18 MR. WOLFGANG: Well, and also attend CFR  
19 Part 50, Appendix R, it also talks about you have to  
20 consider hot shorts. It doesn't set a limit on the  
21 number.

22 MEMBER MAYNARD: Well, I understand that.  
23 But there is a number of the regulations that come to  
24 an agreement between the licensee and staff as to what  
25 are -- what do you have to assume in a number of those

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1 things.

2 So anyway, we will get into it maybe aq  
3 little more with the regulatory evaluation. But I do  
4 not agree that --

5 CHAIRMAN WALLIS: Well, could we clarify  
6 this first bullet? I mean it seems to me that if we  
7 did have this long-held regulatory position, which was  
8 being enforced, then you wouldn't need this generic  
9 letter.

10 MEMBER MAYNARD: Right.

11 CHAIRMAN WALLIS: So something has changed  
12 as the result of these tests. So maybe there was a  
13 position which wasn't very well enforced or something  
14 or was not properly interpreted by the industry. Is  
15 that the problem?

16 MEMBER MAYNARD: Or the staff?

17 CHAIRMAN WALLIS: Well, the staff, yes.

18 MR. FRUMKIN: Well, I think we -- well,  
19 Bob, I think I would say that something did change.  
20 And that thing may not have been entirely the tests.  
21 I think that the staff had high confidence that these  
22 fire barriers that were installed were separating  
23 these redundant trains.

24 And they were removed and they were  
25 replaced with non-barrier solutions which were

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1 analysis, manual actions, and those type of things.  
2 And as soon as the NRC started inspecting post-thermal  
3 lag fixes, which was in 1997, well before these tests.  
4 We had numerous -- there was an information notice  
5 97-something which presented numerous hot short and  
6 multiple -- well, numerous alternate associated  
7 circuits and circuit failure type issues.

8 So to hang this entirely on the test is  
9 not -- certainly the staff position goes before -- to  
10 before the tests. And that has been documented in  
11 that generic -- that information notice and there was  
12 a letter sent to NEI which expressed this sentiment  
13 well before -- I believe that was before the test as  
14 well.

15 CHAIRMAN WALLIS: The purpose of the  
16 generic letter is to reinforcement your enforcement  
17 which you were a bit lax about before or something?  
18 Is that what its purpose is?

19 MR. WOLFGANG: There was a lot of  
20 confusion. You were talking about 3(g)(iii) about  
21 alternative and dedicated shutdown systems and the use  
22 of one only -- you had to consider one spurious  
23 actuation there --

24 MR. FRUMKIN: Right, 3(g)(iii) and the  
25 Generic Letter 86-10 talked about spurious actuations

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1 quite a bit but the staff position is that those  
2 didn't apply to 3(g)(ii) and they were erroneously  
3 applied to 3(g)(ii), which is all we're really talking  
4 about right now. We are not talking about these 3(g)  
5 (iii) inspections that occurred in the 80s. We're not  
6 talking about the 3(g)(iii) approvals.

7 Every 3(g)(iii) program should have been  
8 approved with an SER. That was the policy. But we  
9 did not go into the 3(g)(ii) areas because the  
10 barriers and those solutions should have been  
11 sufficient.

12 MEMBER MAYNARD: It just seems to me that  
13 with all the confusion that has gone on for a number  
14 of years on this, a much cleaner way of doing this is  
15 if the NRC believes that this is something that needs  
16 to be done is just to come out with it as a  
17 requirement following the process for rulemaking, for  
18 changes, or whatever rather than trying to handle it  
19 through a generic letter requesting information to  
20 show compliance with a very confusing set of  
21 requirements.

22 MEMBER-AT-LARGE SIEBER: I suspect,  
23 though, that the staff does not believe that  
24 rulemaking is required, that the proper regulations  
25 already exist.

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1 MR. FRUMKIN: That is correct.

2 MEMBER-AT-LARGE SIEBER: In the review  
3 process that the staff has used in the past does not  
4 establish new regulations. The regulations are the  
5 regulations. And how the staff reviews something is  
6 another matter.

7 MEMBER MAYNARD: Well, how they review it  
8 but what it is accepted as to your certain assumptions  
9 and things --

10 MEMBER DENNING: I'm sure we are going to  
11 come back to this issue. So why don't you go ahead --

12 MEMBER-AT-LARGE SIEBER: It won't go away.

13 MR. WOLFGANG: Okay, moving to the next  
14 slide, more purposes of issuing a generic letter,  
15 respond to the Agency's need to provide clarification  
16 and closure of outstanding fire protection issues,  
17 respond to the licensee's request to provide  
18 clarification of regulatory expectations, and respond  
19 to the region's request to provide clarification of  
20 regulatory expectations for circuit inspections. And  
21 circuit inspections were resumed January 2005.

22 Generic letter, what information it is  
23 requesting from the licensees. Within 90 days to  
24 evaluate their licensing basis and information in the  
25 generic letter regarding multiple spurious actuations

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1 in the Post-Fire Safe-Shutdown Circuit Analysis.

2 MEMBER MAYNARD: Is that practical to  
3 expect -- I think we might get into a little bit more  
4 as to what we are really asking here but within 90  
5 days, for the whole industry to do this, I'm sure  
6 there is going to be some resources -- external  
7 resources needed in some cases.

8 With the whole industry trying to use  
9 those, is 90 days really a practical time frame to get  
10 what is really being asked for here?

11 CHAIRMAN WALLIS: Well, we believe that it  
12 is. But, you know, I guess when NEI talks, they have  
13 a consensus from the industry that it is not a  
14 sufficient time, We can always adjust that.

15 MR. WOLFGANG: Yes, I think what is being  
16 asked here is not for the technical evaluation of the  
17 entire circuit analysis. What we are asking for is  
18 for licensees to report whether they have a multiple  
19 spurious licensing basis or they have a single  
20 spurious licensing basis.

21 For those plants that have a multiple  
22 spurious and haven't analyzed for multiple spurious,  
23 then that is going to be a long-term fix. All we are  
24 asking them to do is to report their situation within  
25 90 days, which is a licensing --

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1                   MEMBER DENNING: Wait a second. How do  
2 they submit their functionality assessment of effected  
3 SSCs without doing that total analysis? Am I missing  
4 something here? And this is within 90 days, if  
5 you're not in compliance, you have to submit this  
6 functionality assessment of effected SSCs.

7                   MEMBER APOSTOLAKIS: And compensatory  
8 measures.

9                   MEMBER DENNING: And compensatory  
10 measures. I think that is the whole analysis, isn't  
11 it? I mean you don't necessarily know how you are  
12 going to ultimately correct them but it seems to me  
13 that the analysis has to be done in 90 days.

14                   Incidentally, I should have mentioned that  
15 listening in is EPM, which is a company that does this  
16 kind of stuff. But I should have mentioned that  
17 earlier that we do have an open line here.

18                   I'm sorry, go ahead.

19                   MR. WOLFGANG: Yes, what we are asking --  
20 yes, to submit the functionality assessment of  
21 effected SSCs.

22                   MEMBER DENNING: Yes. How do you  
23 determine what SSCs are effected unless you have  
24 looked at the multiple spurious actuations.

25                   MR. WOLFGANG: Yes, they have to look at

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1 the multiple spurious actuations.

2 MR. FRUMKIN: First, I agree with the  
3 member that doing a full analysis for 104 plants in 90  
4 days is not going to be credible. This is a major  
5 effort to look at that.

6 I believe though that the second bullet of  
7 compensatory measures for these areas where the plants  
8 are capable of putting compensatory measures and then  
9 solving the problems in a long-term program. That is  
10 credible. That is possible.

11 MEMBER APOSTOLAKIS: It seems to me that  
12 the 90 days applies to the first bullet but not the  
13 sub bullets.

14 MEMBER MAYNARD: I think it does a -- it  
15 certainly applies to the first bullet.

16 MEMBER DENNING: But the sub bullets are  
17 there in the generic letter.

18 CHAIRMAN WALLIS: Well, why is there an  
19 assumption that they are not in compliance now? I  
20 mean that they have done various things today to meet  
21 the regulations already. And their position would  
22 probably be we are in compliance now. So what are you  
23 asking us to do?

24 MEMBER DENNING: No, I don't think so.

25 MEMBER-AT-LARGE SIEBER: Well, if you took

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1 the lag out of your plant --

2 CHAIRMAN WALLIS: That's the problem.

3 They have changed something.

4 MEMBER-AT-LARGE SIEBER: You changed the  
5 configuration.

6 CHAIRMAN WALLIS: That is okay. So they  
7 have changed something. Thank you.

8 MEMBER DENNING: It is not just that,  
9 Graham. They have argued that this has not been the  
10 requirement. That you didn't have to do multiple  
11 spurious actuations. They did one at a time or a  
12 single. So they would argue this is not the  
13 regulatory -- they would argue that it is new  
14 requirement but kind of like Otto has.

15 MEMBER KRESS: But the regulation says  
16 broadly that under these conditions, you have to have  
17 one train of safe shutdown. And that can only be  
18 interpreted as multiple spurious actuation I think.

19 MEMBER MAYNARD: I don't think -- I don't  
20 agree with that. Through the regulatory process, you  
21 don't necessarily have to assume everything that  
22 anybody could ever conceivably come up with. And so  
23 that's why the NRC and the industry -- but you decide  
24 on a set of assumptions. And what you really have to  
25 assume to reasonably meet that requirement.

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1           And then as new information comes along,  
2           if those previous assumptions weren't conservative  
3           enough, you may need to do that. But that really  
4           constitutes a change there. Otherwise why would you  
5           have any guidance documents or any -- what is allowed  
6           to assume or whatever. So I would argue that it is  
7           part of it.

8           MEMBER DENNING: In some respect, this is  
9           an open-ended problem in terms of, you know, and so it  
10          begs for some kind of guidance as to where you end the  
11          search for things that can go wrong.

12          Continue.

13          MR. WOLFGANG: We are asking that within  
14          six months to submit the plan to return all effected  
15          SSCs to compliance with the regulatory requirements.  
16          And that is the plant modifications, license .  
17          Exemption request.

18          And we are also asking that within 30  
19          days, if you cannot meet the 90-day, six month  
20          schedule that we are requesting, you provide us  
21          notification you cannot meet it and your suggested  
22          schedule and completion date.

23          CHAIRMAN WALLIS: What kind of things  
24          would they do to come into compliance? Are they going  
25          to change these offending cables? Are they going to

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1 change the way in which they put out fires? Are they  
2 going to change the actual equipment in the SSC? It  
3 is very open ended what they are expected to do.

4 MR. WOLFGANG: Yes, they can protect  
5 cables. They can reroute cables. They can submit  
6 license amendments based on a risk analysis method --  
7 those type of things.

8 CHAIRMAN WALLIS: Manual actions?

9 MR. WOLFGANG: Well, not in 3(g)(ii)  
10 space. There are a lot of ways.

11 MEMBER DENNING: I don't know how  
12 expensive those ways are. I mean we say there are  
13 lots of ways but those ways may be extremely  
14 expensive.

15 CHAIRMAN WALLIS: Well, I'm also unclear  
16 about what it is they are supposed to assume can go  
17 wrong? When I read these things about they are  
18 supposed to assume the possibility that this can  
19 happen, it goes back to Otto's question here.

20 I mean if you assume the very worst that  
21 could possibly happen, then you could have enormous  
22 changes in the plants in order to avoid this worst  
23 conceivable thing. Is that what you are asking them  
24 to do?

25 MR. WOLFGANG: You have to assume all

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1 multiple spurious actuations.

2 CHAIRMAN WALLIS: Well, but that is a  
3 major thing, isn't it?

4 MEMBER MAYNARD: That is major.

5 CHAIRMAN WALLIS: You have to assume that  
6 it happens with the probability of one?

7 MR. WOLFGANG: Yes.

8 MEMBER-AT-LARGE SIEBER: Yes. On the  
9 other hand --

10 MR. WOLFGANG: 3(g)(ii) in deterministic  
11 space doesn't limit the number of --

12 MEMBER-AT-LARGE SIEBER: On the other  
13 hand, you restrict the fire to a single fire area,  
14 which means that if you have appropriate separation or  
15 fire barriers that you have a train that is free of  
16 fire, that will operate.

17 MR. WOLFGANG: Right.

18 MEMBER-AT-LARGE SIEBER: And that is the  
19 principle. I think it is going to vary dramatically  
20 from plant to plant, especially based on the age of  
21 the plant and the type of plant. I think some are  
22 going to be tremendously impacted. Some others may  
23 not. And again, depending on what assumptions you  
24 really have to make and what credit you can take for  
25 things you already have in place, things that have

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1 already been done, everything from operator actions to  
2 fire loadings, improvement in fire control,  
3 everything.

4 MEMBER DENNING: And, Jack, you talked  
5 about the separating of trains. And that's, you know,  
6 pretty straight forward. But isn't the real open  
7 endedness related to the spurious actuations where  
8 there is some unanticipated valve opens that effective  
9 give you a loss of coolant accident or something like  
10 that, that, you know, introduces a different element  
11 to safe shutdown. Isn't that the open-endedness that  
12 makes it so difficult.

13 And I also don't know whether -- how many  
14 plants really know what cables are in what trays  
15 within a room.

16 Obviously if you are going to do -- yes so  
17 that you basically are assuming anything within the  
18 room -- I mean you know that -- you have concluded  
19 that it has gone through a room up to this point.  
20 But, you know, they could be in totally different  
21 trays in the room. But you don't know where they are  
22 in the room.

23 CHAIRMAN WALLIS: Well, you have to assume  
24 that they are all together and they are all --

25 MEMBER DENNING: Assume that you have to

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1 submit it. But I don't know the answer to that.

2 MEMBER KRESS: Assume that you have to do  
3 it. But I don't know the answer to that.

4 MR. WOLFGANG: Well in a fire area in a  
5 room, if you assume a fire, you have to assume  
6 everything is --

7 MEMBER KRESS: Yes, but can everything  
8 have an inter --

9 CHAIRMAN WALLIS: Everything in that room  
10 can short together?

11 MEMBER KRESS: -- can it short together as  
12 an inter-cable connection even though it may be way  
13 separated?

14 MR. FRUMKIN: No, if it couldn't occur,  
15 then it wouldn't be -- I mean you wouldn't have -- we  
16 wouldn't be expecting energized cables to penetrate  
17 conduits. We wouldn't expect energized cables to jump  
18 from tray to tray.

19 Or, for example, DC current has to have  
20 the same path. If it is not in the same tray or same  
21 conduit you couldn't actuate that from an AC circuit  
22 or something of that nature.

23 MEMBER DENNING: I don't know whether --  
24 what utilities know what cables --

25 MR. FRUMKIN: Right, no, you are correct.

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1                   MEMBER DENNING: -- are in what trays you  
2 were going to run.

3                   MR. FRUMKIN: And that can be a very  
4 significant effort.

5                   One of the aspects is that for the  
6 3(g)(ii) area -- or for the 3(g)(iii) plants, some of  
7 the older plants are 3(g)(iii). And they don't have  
8 very much separation at all. But they have done a  
9 significant analysis that was reviewed in the 80s  
10 which we referred to earlier. And they do have the --  
11 because they have done that detailed analysis, they  
12 have the flexibility to do manual actions.

13                   So in effect, the newer plants with the  
14 good separation should be fairly well off. The older  
15 plants that had very little separation probably have  
16 done a lot of this analysis already and may already be  
17 in compliance.

18                   It is the middle plants that are more  
19 likely than the older plants to have the circuits  
20 traced. But they are kind of in the middle there.  
21 And they are the ones who I think are going to be  
22 having a more difficult time answering this generic  
23 letter.

24                   MEMBER-AT-LARGE SIEBER: That is a pretty  
25 limited number of plants then. This issue is, you

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1 know, I was a young man when this issue came out. The  
2 work has been done. And the plants that were built in  
3 the 80s, to my knowledge they all had pull tickets  
4 associated with cables when they were originally  
5 routed.

6 So you just run your computer and it tells  
7 you whether you've got separation or not. And if you  
8 don't, what circuits are offending circuits.

9 MR. FRUMKIN: Many plants have that. Or  
10 some plants have that.

11 MEMBER-AT-LARGE SIEBER: Some plants have  
12 it. Some plants had to do that all manually, hand  
13 over hand.

14 MR. FRUMKIN: But I just want to add one  
15 thing that the staff has come our with a statement --  
16 or, well, not really a statement but what 3(g)(ii)  
17 says is that when cables of the redundant trays are  
18 within the same fire area and are not protected, so if  
19 you have a area with train A equipment in it and no  
20 train B equipment or the train B is protected in  
21 accordance with 3(g)(iii) protection criteria, we're  
22 not -- so with the train B protected, we're not  
23 limiting the actions that -- the feasible and reliable  
24 actions for failures on train A.

25 So if you have a protected train outside

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1 of a fire area or protected with 3(g)(ii), the  
2 licensees can do feasible and reliable manual actions  
3 on the fire-effected train to let's say close that  
4 valve that opens spuriously or stop that pump that  
5 opens spuriously because there is a full -- typically  
6 from the control room, so there is good annunciation  
7 and indication, there is a full protected train  
8 outside of that fire-effected area.

9 And I'll just point to Alex and see if he  
10 nods at me. Okay, yes.

11 MEMBER-AT-LARGE SIEBER: And there is very  
12 limited amounts of equipment if you had a spurious  
13 actuation, would cause another accident like a LOCA.  
14 Some value opens in the valve is -- like a safety  
15 injection valve, is designed to pump in not pump out.

16 Okay, so there are check valves and things  
17 like that that would prevent that. But there area  
18 few cases -- PRVs for example --

19 MR. FRUMKIN: Yes, PRVs is one I was  
20 thinking of if you --

21 MEMBER-AT-LARGE SIEBER: Yes , that could  
22 open and --

23 CHAIRMAN WALLIS: New plant designs have  
24 this screw valves. And the spurious actuation of them  
25 create a LOCA.

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1 MEMBER-AT-LARGE SIEBER: Yes, but they  
2 have them so you get to a safer condition, right?

3 CHAIRMAN WALLIS: One question I was going  
4 to --

5 MEMBER-AT-LARGE SIEBER: It is just  
6 expensive to do it.

7 MEMBER DENNING: Yes, is there any kind of  
8 assessment as to what fraction of spurious actuations  
9 actually are deleterious as far as effecting safe  
10 shutdown capability? I mean has anybody in a risk  
11 study done that kind of an assessment? Or do you have  
12 any feeling as to the fraction of spurious actuations  
13 that will get you into trouble?

14 MR. FRUMKIN: Well, you asked for that.  
15 We have this bounding analysis that we did and you  
16 actually -- well, you have to look at a lot to find  
17 the ones that are going to give you problems from a  
18 spurious actuation standpoint. But in our bounding  
19 analysis, it took five pairs of spurious actuations in  
20 order to get a significant risk.

21 And it is because these spurious system --  
22 these multiple spurious effect systems that, you know,  
23 are the redundant train. So it effects both -- the  
24 train, the productive train or the unprotected train,  
25 and the redundant train so you really lose all your

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1 protection with these scenarios. And it doesn't --  
2 you have to look at a lot to find the bad players.  
3 And there don't actually have to be a lot of bad  
4 players, at least based on our bounding analysis for  
5 it to be of fairly high risk significance.

6 MEMBER DENNING: Continue please.

7 MR. WOLFGANG: Background since 1997,  
8 multiple LERs brought lack of consensus concerning  
9 circuits to the staff's attention. And this led to a  
10 moratorium on inspection of circuit issues back in  
11 1997.

12 In 2001, NEI/EPRI cable fire test  
13 demonstrated that multiple spurious actuations can  
14 occur. And they can occur in rapid succession or  
15 simultaneously without sufficient time for mitigation  
16 in between.

17 Therefore if a licensee doesn't account  
18 for multiple spurious actuations, and its circuits  
19 analysis, the licensee may not be in compliance with  
20 10 CFR 50.48 and 10 CFR Part 50, Appendix A, General  
21 Design Criteria, and (3) which require that a licensee  
22 provide and maintain free from fire damage, one train  
23 of systems necessary to achieve and maintain the safe  
24 shutdown.

25 Staff has developed the risk-informed

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1 approach to inspections to focus on risk-significant  
2 configurations based on the cable fire test. And this  
3 is RIS 2004-003.

4 MEMBER DENNING: Now let me ask with  
5 regard to that, I understand that that was prepared  
6 for inspection as opposed to compliance.

7 MR. WOLFGANG: Correct.

8 MEMBER DENNING: But is there a real  
9 reason why one couldn't use guidance of that type for  
10 compliance as well? Do you see a regulatory  
11 constraint that would prevent you from -- I mean from  
12 the regulations that exist now, do you think it would  
13 be incompatible for the staff to provide the  
14 equivalent, perhaps a perturbation off of that or  
15 perhaps a revision to NEI's risk-informed guidance?  
16 Why can't we do that?

17 MR. WOLFGANG: I think the thing is we  
18 haven't seen licensee's risk tools, their model that  
19 we would have to approve prior to them using any risk  
20 analysis.

21 MR. KLEIN: Let me take a shot at  
22 answering the question maybe at a higher level. And  
23 that is with respect to licensees who are required to  
24 meet the requirements of Appendix R. Don't today have  
25 the ability to change that regulation or the

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1 commitment to that regulation based upon risk  
2 information.

3 If they want to do that, they would have  
4 to seek an exemption request from us against the  
5 regulation. They may certainly use risk information if  
6 they want to come in and see us with an exemption  
7 request, that is certainly open to them.

8 But what I think Bob is indicating is that  
9 a licensee may not make a change in their plant using  
10 risk information and making the conclusion based upon  
11 their standard license condition that says that, you  
12 know, it doesn't effect their ability to achieve and  
13 maintain safe shutdown.

14 The staff has been telling licensees that  
15 we would like them to come in and see us for such an  
16 exemption request or a license amendment.

17 MEMBER DENNING: Yes, I understand that  
18 that is the way -- that is the process by which they  
19 would use risk information to do that. But this first  
20 bullet is generic. It is generic information as to  
21 how many combinations of things or what are kinds of  
22 situations that are -- could be expected to be risk  
23 significant?

24 Now I realize it is not totally complete  
25 but it, you know, it gave guidance to the inspectors

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1 as to what are the combinations of things that could  
2 risk significant to look at and make sure. And I  
3 don't see any reason why one couldn't effectively rule  
4 out some of this total space of situations that the  
5 applicant has to look at to be compliant.

6 Now, you know, Tom is saying -- and I  
7 think it is kind of the regulatory position that  
8 you've got to look at everything because anything that  
9 can prevent this safe shutdown pathway is a potential  
10 problem. But you used it for the inspector to give  
11 him guidance on what is risk important and not in the  
12 area.

13 Couldn't you have done the same to provide  
14 generic guidance on this is how far you have to go in  
15 this process of looking at multiple spurious  
16 actuations.

17 MR. FRUMKIN: Bob, let me -- I'll be  
18 candid. We tried very hard to read 3(g)(ii) as a --  
19 to be risk informed in the way you describe. And with  
20 help from our lawyers, we were unable to get there for  
21 those pre-`79 plants. And then there is also the  
22 Agency or the Commission has approved a risk-informed  
23 rule.

24 And although it is more comprehensive,  
25 that is out there. And we considered the possibility

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1 of a risk-informed changed to this rule, to the  
2 current 3(g)(ii), and there is currently a rule that  
3 has been promulgated by the Commission. So that did  
4 not seem like a credible approach.

5 CHAIRMAN WALLIS: Well, could I follow up  
6 on that? And I looked at this risk informed approach.  
7 It seems to be just advice on vendors --

8 MR. FRUMKIN: Yes?

9 CHAIRMAN WALLIS: -- to focus on certain  
10 configurations. Well, that's okay. Focus on what  
11 matters. But then how does this inspector decide to  
12 reach some sort of a finding that something is not  
13 adequate? Or is not in compliance. That would get  
14 closer to tying these things together because the  
15 whole question here is what do they have to do in  
16 order to be in compliance.

17 MR. FRUMKIN: That is correct.

18 CHAIRMAN WALLIS: And how does the  
19 inspector know when they are in compliance or not?  
20 Well, he has just chose to focus on these things. How  
21 does he then decide when he is focused whether or not  
22 they are in compliance?

23 MR. FRUMKIN: And the answer to that is  
24 they pull up the licensing basis and if the licensing  
25 basis, if they do not have -- are not licensed for

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1 single spurious, that are considered to be -- required  
2 to look for multiple spurious.

3 CHAIRMAN WALLIS: Well then what are they  
4 supposed to do?

5 MR. FRUMKIN: Then that would be -- that  
6 could be -- that would be a finding would be run  
7 through the risk analysis of this STP. It would be  
8 cited. And the licensee would have to resolve a  
9 finding in the normal manner.

10 MEMBER DENNING: Incidentally, I think  
11 your last statement about their legal interpretation  
12 of pre-`79 is very important as far as our  
13 considerations are concerned because I mean it could  
14 be indeed that we are in a box in terms of whether you  
15 can risk inform the current regulation or whether you  
16 would need to change a rule which is obviously a huge  
17 undertaking.

18 CHAIRMAN WALLIS: Well, I'm really  
19 wondering, you made an initial statement that we  
20 should have had a subcommittee meeting. We seem to be  
21 at the level of behaving like a subcommittee so trying  
22 to determine whether or not you are ready to go to the  
23 full Committee because there seems to be so many  
24 questions here. And yet we are here as a full  
25 Committee.

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1                   MEMBER DENNING: That is why we have three  
2 whole hours.

3                   CHAIRMAN WALLIS: You know subcommittees  
4 sometimes have the option of saying you guys aren't  
5 ready. You shouldn't go to the full Committee. But  
6 they are here.

7                   MEMBER DENNING: The full Committee has  
8 that same option, doesn't it?

9                   MR. WOLFGANG: To continue, in 2004, staff  
10 held a public meeting in Atlanta to discuss the staff  
11 positions and solicit stakeholder feedback. We worked  
12 with NEI to finalize an acceptable industry guidance  
13 document for circuit analysis. And that was NEI 0001.

14                   Staff issued RIS 2005-30 to clarify  
15 regulatory requirements for a circuit analysis. And  
16 that RIS addressed the terms associated circuits, any  
17 and all, and emergency control stations.

18                   And this draft generic letter was issued  
19 for public comment in October 2005. We held a public  
20 meeting in March of this year. And the pertinent  
21 public comments were incorporated into the final draft  
22 of the generic letter. And we also received CRGR  
23 approval to issue the generic letter.

24                   The basis for the generic letter -- the  
25 bulleted review of NRC regulations, generic

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1 communications, correspondence related to this issue.  
2 And we have references identified in the generic  
3 letter. The results of the 2001 NEI EPRI cable fire  
4 test program, prior to the cable fire test, there was  
5 very little information available regarding circuit  
6 failure during a fire which made enforcement of the  
7 regulations in this area difficult. And also input  
8 from inspectors on issues that needed to be addressed.

9 The issue clarified in the generic letter  
10 is multiple spurious actuations. As Dan said earlier,  
11 some licensees claim that only a single spurious  
12 actuation had to be assumed in their circuit analysis.  
13 This was based on a misinterpretation of Generic  
14 Letter 86-10 in response to question 5.3.10.

15 And also some licensees claimed multiple  
16 spurious actuation occur with sufficient time in  
17 between them to take mitigating actions.

18 CHAIRMAN WALLIS: Now this  
19 misinterpretation has been going on for how long?  
20 D.L. 86 is 9/86?

21 MR. WOLFGANG: Yes.

22 CHAIRMAN WALLIS: Over 20 years they have  
23 been under some misapprehension about the regulations?

24 MR. WOLFGANG: That is my understanding.

25 MR. FRUMKIN: In this section of the

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1 generic letter, it refers to the 3(g)(iii) associated  
2 circuits I believe. So it took 3(g)(iii) alternate  
3 shutdown -- I'm sorry -- it took this 3(g)(iii)  
4 assumption and applied it to 3(g)(ii) areas. And that  
5 is what this misinterpretation is describing.

6 MEMBER APOSTOLAKIS: Let me understand it  
7 a little bit the second bullet here. Suppose there is  
8 sufficient time between actuations? Okay, so you have  
9 the first one. You really don't know what the second  
10 one is going to be, right? It could be anything.

11 MR. WOLFGANG: Second.

12 MEMBER APOSTOLAKIS: Oh, let's say there  
13 are two --

14 MR. WOLFGANG: Actuations?

15 MEMBER APOSTOLAKIS: -- spurious -- yes.

16 MR. WOLFGANG: Yes, based on these tests,  
17 they could occur --

18 MEMBER APOSTOLAKIS: No, I understand  
19 that, that it is a very short time.

20 MR. WOLFGANG: Right.

21 MEMBER APOSTOLAKIS: But let's assume for  
22 a moment that there is sufficient time, there is long  
23 time between them.

24 MEMBER DENNING: And there may be, George.  
25 There is a contention that --

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1 MEMBER APOSTOLAKIS: Okay.

2 MEMBER DENNING: Yes, right.

3 MEMBER APOSTOLAKIS: But you still don't  
4 know what the second one is going to be.

5 MEMBER DENNING: Is going to be, right.

6 MEMBER APOSTOLAKIS: So you can really  
7 take mitigations actions without know what the second  
8 will be?

9 MEMBER DENNING: Well, now wait a second.  
10 If you have mitigated the first one --

11 MEMBER APOSTOLAKIS: Yes.

12 MEMBER DENNING: -- then it is as if you  
13 now just have one.

14 MEMBER APOSTOLAKIS: Oh, so now you are  
15 going to get together and wait.

16 MR. WOLFGANG: And when the second one  
17 occurs and you have time to mitigate that one.

18 MEMBER APOSTOLAKIS: And this is doable?  
19 I mean has anybody looked into the details of this?  
20 It comes back to this issue of open endedness. You  
21 really don't know what is going to happen next. So I  
22 don't understand this particular -- I mean have they  
23 submitted details, you know, if you have sufficient  
24 time, you will protect the plant?

25 MEMBER DENNING: You know what I think

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1 would help us is we had some better feeling as to how  
2 do they really mitigate these actuations?

3 MEMBER APOSTOLAKIS: Yes, exactly,  
4 exactly.

5 MEMBER DENNING: What is a typical -- and  
6 I know there are constraints on manual --

7 MR. WOLFGANG: Yes, in 3(g)(ii), they  
8 can't use manual actions.

9 MR. KLEIN: Licensees have commonly used  
10 operator manual actions to mitigate that spurious  
11 actuation. They may send an operator out in a plant  
12 to close a valve or some such action like that. And  
13 then they wait for the next actuation and they say,  
14 okay, I've got plenty of time available to have taken  
15 that first action. And now they wait for the second  
16 action. And when that occurs, they send the operator  
17 out.

18 So I think that second bullet there is to  
19 just simply indicate to the Committee that that is the  
20 claim that some licensees have made. That is not  
21 necessarily a position that the staff agrees with.

22 MEMBER APOSTOLAKIS: No, I understand  
23 that.

24 MR. WOLFGANG: Yes.

25 MEMBER APOSTOLAKIS: But I'm trying to

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1 understand the position.

2 MEMBER DENNING: Now suppose you had --  
3 suppose it takes 30 minutes to have them get out there  
4 and close the valve, now obviously -- more than, you  
5 know, and then something else happens say before he  
6 closes that valve, then the real question is there a  
7 compounding effect?

8 MR. WOLFGANG: And I guess like --

9 MEMBER DENNING: As far as you don't have  
10 enough operators that you can send out to do all these  
11 --

12 MEMBER APOSTOLAKIS: The real question is  
13 is the length of time the critical variable here. And  
14 it doesn't seem to me to be.

15 MR. FRUMKIN: I mean we'll give you an  
16 example, for example if you have a -- you going to  
17 drain two valves in series that would drain the RWST  
18 and you also damage a number of other equipment. They  
19 fail. They short out and become unavailable.

20 Well, if you have -- if you lose the  
21 indication on the RWST and you open up the valve and  
22 you say you have plenty of time to -- you have  
23 indication the valve opened spuriously, you can go  
24 down and close the valve and then when the next valve  
25 opens, it has no effect.

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1 I think that would be an example of where  
2 they feel they would have sufficient time. Let's say  
3 the circuits are in cable trays -- you know, 20, you  
4 know, six cable trays above. There is going to be a  
5 good deal of time before the first cable tray is  
6 damaged and the next -- the first cable is damaged and  
7 then the next cable.

8 So -- and from a risk standpoint, you  
9 might be able to argue yes, we will have adequate  
10 indication that the valve opened and we have adequate  
11 time. And then that could be a risk-informed type  
12 analysis.

13 But if they are in the same cable, then  
14 they both could open simultaneously.

15 MEMBER MAYNARD: If there is time and  
16 there are a number of things they can do, when you  
17 have a fire in an area, you typically know what cables  
18 and what other things could be potentially effected in  
19 that and the manual actions going out either manually  
20 isolating valves, pulling breakers, a number of things  
21 you can do. But it is based on what is in that area  
22 or what could be effected with those in that area.

23 MEMBER APOSTOLAKIS: I remember when I was  
24 reading the analysis of the Browns Ferry fire a long  
25 time ago. They did have spurious actuations there did

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1 they not?

2 MR. WOLFGANG: Yes.

3 MEMBER APOSTOLAKIS: Within 20 minutes I  
4 believe they had all sorts of signals and so on. And  
5 then things started going dead. How does that  
6 experience fit into this?

7 MR. FRUMKIN: I think that experience is  
8 "the long-held staff position" that multiple  
9 simultaneous spurious actuations occur. I think when  
10 you want to point your finger to where we come up with  
11 that, it comes from 1975. It comes from the very  
12 beginning of fire protection regulation is that these  
13 spurious actuations occur.

14 And I think that -- unfortunately the  
15 statements of consideration for Appendix R are short.  
16 You know we have, you know, dozens of pages for a  
17 short NFPA-805 and there may be a dozen pages and a  
18 page maximum for 3(g)(iii) -- for 3(g) of Appendix R.  
19 So we really can't go back in time and pull out the  
20 basis for that. But we have Mark Sallies here, he  
21 might be able to shed some light on that.

22 But I believe that that is the long-held  
23 staff position is the Appendix R fire and these  
24 multiple spurious and rapid succession starting pumps  
25 giving incorrect indication, doing all sorts of

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1 unpleasant things to the plant.

2 CHAIRMAN WALLIS: The incorrect indication  
3 is a big problem. Something has happened and yet you  
4 don't know quite what has happened. That is another  
5 variable altogether from the time. I mean it is the  
6 uncertainty of knowing what is going on which might  
7 lead the operator to do the wrong thing.

8 MEMBER-AT-LARGE SIEBER: Yes, on the other  
9 hand, indications usually either go full scale or to  
10 zero.

11 MEMBER MAYNARD: A lot of times you've got  
12 multiple indications. And that is something they are  
13 trained on quite a bit is on instrument failures.  
14 That said, it is not uncommon to have an instrument  
15 failure without a fire. So they are trained on how to  
16 handle that.

17 MR. FRUMKIN: Right. One of the failure  
18 though they can also get -- and, again, there's  
19 multiple indications, but they could get an indication  
20 of a pump starting when it didn't start. Or a pump in  
21 a start and stop position and then that's going to  
22 take time for them to troubleshoot and whether it was  
23 started or stopped could it be adversely effecting  
24 overfilling the plant or not.

25 There are a number of timing issues that

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1 I'm sure they are trained on. But they can be  
2 potentially challenging.

3 MEMBER DENNING: Continue.

4 MR. WOLFGANG: The NRC letter from Sam  
5 Collins to NEI in 1997 stated that multiple spurious  
6 actuations caused by fire-induced hot shorts must be  
7 considered and evaluated. As I stated earlier, Byron  
8 and Braidwood have SCRs approving the assumption of a  
9 single spurious actuation for a fire event. So if the  
10 staff position is applied to them, it would be  
11 considered compliance backfit.

12 The generic letter --

13 MEMBER-AT-LARGE SIEBER: That's a unique  
14 case, those two plants.

15 MR. WOLFGANG: Yes, correct. The generic  
16 --

17 MEMBER APOSTOLAKIS: But what does that  
18 mean now?

19 MR. WOLFGANG: They are in compliance by  
20 definition.

21 MEMBER APOSTOLAKIS: You would say the SCR  
22 was not correct or what?

23 MR. WOLFGANG: They are in compliance by  
24 definition, right.

25 MEMBER APOSTOLAKIS: But I don't

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1 understand this compliance backfit.

2 CHAIRMAN WALLIS: Compliance by mistake is  
3 what I heard earlier.

4 MR. WOLFGANG: Well, by regulatory  
5 approval.

6 MEMBER APOSTOLAKIS: Can you explain the  
7 parenthesis? If stop position is applied to them, it  
8 would be a compliance backfit. You mean the current  
9 position?

10 MR. WOLFGANG: If they comply with their  
11 SER, the SER is approved even though it was a mistake,  
12 it would be a compliance backfit if we made them  
13 change.

14 MEMBER APOSTOLAKIS: So you would have to  
15 admit then that the SER was not correct?

16 MR. WOLFGANG: We have already admitted  
17 that.

18 MEMBER APOSTOLAKIS: Okay.

19 MEMBER MAYNARD: It is a matter of what  
20 regulatory process is used to actually do it. A lot  
21 fo people think backfit is a bad thing. I think it is  
22 a process that should be used a little bit more rather  
23 than trying to go around a lot of these things. Just  
24 say hey look, we've changed or this is a new  
25 requirement. Here's the regulatory burden. Here is

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1 the increased safety benefit. We are imposing this as  
2 the new requirement for you. It's not necessarily a  
3 bad thing. Just what regulatory burden --

4 MEMBER APOSTOLAKIS: But this doesn't  
5 happen too often, right? I mean --

6 MEMBER DENNING: What? Regulatory  
7 mistakes?

8 MEMBER APOSTOLAKIS: Yes.

9 MEMBER DENNING: Right.

10 CHAIRMAN WALLIS: Well, this last bullet,  
11 I have a lot of problem with. And they must be  
12 considered and evaluated. But it seemed to be very  
13 unclear about to what depth and by what methods these  
14 things must be considered and evaluated. That seems  
15 to be so open-ended that the licensee must be  
16 uncertain what he has to do.

17 MEMBER DENNING: RIS provides more detail  
18 than the generic letter does, right. The 2005 RIS.

19 MR. WOLFGANG: 2005-30?

20 MEMBER DENNING: Yes.

21 MR. WOLFGANG: Not on multiple spurious  
22 actuations, no.

23 MEMBER DENNING: No?

24 MR. WOLFGANG: It doesn't address that.

25 We didn't put that in there because we thought

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1 multiple spurious actuations because of this Byron and  
2 Braidwood SCR could be considered possibly a change in  
3 staff position. So that's why we didn't want to put  
4 it in a RIS.

5 CHAIRMAN WALLIS: There is no regulatory  
6 guide that says how to evaluate multiple spurious  
7 actuations?

8 MR. KLEIN: I think if I could respond to  
9 that question, I'll ask Dan also to pipe in. Is on  
10 page 7 of the generic letter where we do talk about,  
11 you know, ways that licensees can bring themselves  
12 into compliance, there is a discussion in there about  
13 the deterministic methodology or NEI-0001.

14 We do talk about the guidance in there in  
15 Chapter 3. We do say that for post-fire safe-shutdown  
16 circuits in conjunction with the guidance provided in  
17 this generic letter that NEI-0001 is one of the  
18 acceptable approaches to achieve regulatory compliance  
19 with the fire protection requirements for multiple  
20 spurious actuations.

21 So that's one example. And Dan can  
22 correct me if I've overstated this.

23 MR. WOLFGANG: And we say in conjunction  
24 with the guidance provided in this generic letter to  
25 mean consider multiple spurious actuation. I believe

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1 NEI-0001 says to consider two spurious actuations.

2 CHAIRMAN WALLIS: That doesn't mean  
3 anything to me. It could simply mean to say well I  
4 considered it and I think it is irrelevant or  
5 something. I mean what does consider mean? But what  
6 depth? By what methods?

7 MEMBER APOSTOLAKIS: To the depth required  
8 to convince the staff.

9 MEMBER BONACA: That is called open ended.  
10 We could fix it here but it seems to me that, you  
11 know, we do have a problem. And we are trying to  
12 figure out what is the best regulatory process to  
13 solve it. But the problem is there.

14 CHAIRMAN WALLIS: Well, I think we agree  
15 there is a problem. It is just whether or not there  
16 is a mature enough process in place to make something  
17 that is workable happen.

18 MEMBER BONACA: I understand.

19 MEMBER-AT-LARGE SIEBER: Well, this work  
20 has already been done once. The only thing that  
21 changed is the disqualification of certain fire  
22 barriers. All the licensees have done this. And it  
23 should be part of their licensing basis. There should  
24 be plant records as to how they did it the first time.

25 MEMBER DENNING: Really, Jack? I mean

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1 isn't there an issue here of the number of licensees  
2 who thought that they were really dealing with one  
3 spurious actuation requirement? Or one at a time?

4 MEMBER-AT-LARGE SIEBER: I can only speak  
5 to one licensee or about one licensee. And that was  
6 not the assumption.

7 MEMBER DENNING: That was not your  
8 assumption.

9 MEMBER-AT-LARGE SIEBER: No.

10 MEMBER DENNING: No. But there are  
11 licensees out there --

12 MEMBER-AT-LARGE SIEBER: Otto, was that  
13 yours? It is sort of obvious from Browns Ferry that  
14 you get more than one.

15 MEMBER MAYNARD: I'm trying to recall  
16 because the only place where we had different trains  
17 mixing was in the control room so it was primarily a  
18 control room-related issue.

19 MEMBER KRESS: But that is one purpose of  
20 the generic letter to find out the status.

21 MEMBER-AT-LARGE SIEBER: The only time the  
22 number of faults becomes an issue is when you are  
23 trying to solve the problem with operator manual  
24 actions. So now you've got too many things for too  
25 few people to do.

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1           But if you have train separation and the  
2 train separation is effective, you are going to get  
3 some spurious actuations which are going to be  
4 upsetting but not fatal. And you are still going to  
5 maintain a full set of safety equipment that  
6 functions. And that is the object of the fire  
7 protection regulation.

8           MR. KLEIN: I would strongly agree with  
9 what Dr. Sieber just indicated in that the focus here  
10 is on 3(g)(ii) compliance and that is where you've got  
11 the redundant trains in the same fire area as Dan had  
12 indicated. And Dan had indicated some of the history  
13 that, you know, led us up to this.

14           And that had to do with the resolution  
15 that some licensees used to address the thermal lag  
16 issue where they removed some of these fire barriers  
17 and in lieu of meeting the separation requirements of  
18 3(g)(ii), elected to put in place the use of operator  
19 manual actions.

20           And I think that is a very important thing  
21 to kind of keep in mind.

22           MEMBER-AT-LARGE SIEBER: But other  
23 licensees pulled no cable.

24           MR. KLEIN: That is correct. I'm not --

25           MEMBER-AT-LARGE SIEBER: They moved

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1 circuits out of the same fire area.

2 MR. KLEIN: Yes, I'm not suggesting that  
3 all licensees implemented unapproved operator manual  
4 actions in lieu of the requirements of 3(g)(ii).

5 There are other licensees who did plant modifications,  
6 did re-analysis, did re-wraps, pulled cables, what  
7 have you to bring themselves back into compliance with  
8 3(g)(ii).

9 MEMBER-AT-LARGE SIEBER: And some of them  
10 didn't use thermal lag to begin with.

11 MR. KLEIN: That is correct.

12 CHAIRMAN WALLIS: Well, I don't really  
13 have a good understanding of what kind of spurious  
14 actions we are talking about, what kind of operator  
15 actions in response we're talking about, and whether  
16 redundant trains solve the spurious action problem.

17 If I have a fire scenario and it switches  
18 on my high pressure injection, I've got a pump that  
19 runs and it is pouring water into the system, right?  
20 For one thing, I have to know -- I have to diagnose  
21 what is happening. Do I have to send somebody  
22 somewhere to shut a valve? And does that factor have  
23 some redundant train help me at all when something has  
24 been activated spuriously? I mean it is not clear to  
25 me what the range of kind of scenarios is that you are

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1 talking about here.

2 And whether redundant trains always help  
3 you or don't. Maybe they don't help you at all  
4 sometimes. And maybe the operator action sometimes is  
5 so severe that it is very difficult to take.

6 MEMBER MAYNARD: I think in most cases,  
7 there are things they can do. But there are some --  
8 and I think the power operator relief valve is one  
9 that if you have a system where you can't operate the  
10 block valve or the PRE, if it opens you basically have  
11 given yourself a small break.

12 CHAIRMAN WALLIS: That's what I think.  
13 When you think about TMR, they had a false indication  
14 because there was a light which said it was closed  
15 when it was open.

16 MEMBER MAYNARD: But most times you are  
17 still covered by -- I mean you are still analyzed for  
18 a small break LOCA or for the other events. A pump  
19 coming on, there are multiple ways to turn pumps off.  
20 And you are not going to be injecting water at such a  
21 rate that you have, you know -- I'm kind of talking  
22 more PWR than I am BWN here so I --

23 MEMBER DENNING: But it is those things  
24 though -- it is the multiplicity of those things that  
25 boggles my mind. You know rather than train

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1 separation and train protection which you talked  
2 about, it just seems like there is such a multiplicity  
3 of potential things and trying to analyze all those  
4 things seems almost open ended.

5 MEMBER-AT-LARGE SIEBER: There aren't --  
6 in sheer numbers, there aren't all that many safety  
7 circuits. And if you go underneath the control room  
8 into the faucet rafter, you'll find loads of jumpers  
9 and knife switches and things like that where you can  
10 de-energize control circuits.

11 Now one of the problems is that it  
12 actually, in a lot of circuit breakers, it takes power  
13 to trip it, you know. The trip coil requires  
14 energization so pulling a knife switch doesn't  
15 guarantee that it will run forever. And so the  
16 operator really has to understand how the control  
17 system is set up to be able to do that.

18 But there are ways to overcome these  
19 problems that don't require excursions all over the  
20 plant. And on the other hand, the plant is designed  
21 to be safe provided that you have a functional safety  
22 train. Separation criteria, if rigidly applied,  
23 provides that independent safety train.

24 MEMBER DENNING: We are going to now take  
25 our break until 20 after 10. And then we will have to

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1 move surprisingly quickly after that.

2 CHAIRMAN WALLIS: Okay. So we're going to  
3 take a break until 20 past 10.

4 (Whereupon, the foregoing matter went off  
5 the record at 10:09 a.m. and went back on the record  
6 at 10:23 a.m.)

7 CHAIRMAN WALLIS: Rich, would you resume  
8 the management of the meeting, please?

9 MEMBER DENNING: Please proceed.

10 MR. WOLFGANG: Okay. The last issue,  
11 clarifying the generic letter, the point we have here  
12 is the staff position on multiple spurious actuations  
13 presented in the generic letter is consistent with  
14 section 9.5.1 of the standard review plan.

15 Public comments. The significant public  
16 comment was that the generic letter constituted a  
17 backfit to licensees. And we addressed this comment.  
18 We obtained CRGR approval to issue this generic  
19 letter. And, as I said earlier, only for Byron and  
20 Braidwood, who have approved SERs that we know of,  
21 would this constitute a backfit.

22 Basically, this generic letter is just a  
23 request for information.

24 MEMBER MAYNARD: I would challenge that.

25 MR. WOLFGANG: Yes. I think --

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1                   MEMBER MAYNARD: That's all right. We'll  
2 comment on that.

3                   CHAIRMAN WALLIS: It isn't just a request  
4 for information. It asks them to do a lot of things.

5                   MEMBER MAYNARD: Yes. That is what I  
6 challenge, that statement. Yes. We've talked about  
7 it.

8                   CHAIRMAN WALLIS: That was what I was  
9 uncertain about.

10                  MEMBER DENNING: Why don't you go ahead  
11 and summarize, even though we're going to have a  
12 couple of other things? Why don't you go ahead and  
13 summarize? Then there are a couple of other things we  
14 would like you to -- we have more than started. We're  
15 almost done.

16                  MR. WOLFGANG: A summary. The generic  
17 letter, as I said before, is a request for information  
18 from licensees. The industry cable fire test program  
19 reaffirmed the staff interpretation of the regulatory  
20 requirements concerning multiple spurious actuations  
21 must be considered in the circuits analysis. The  
22 generic letter is necessary to ensure that all  
23 risk-significant circuit situations are identified and  
24 addressed.

25                  CHAIRMAN WALLIS: Could you go back a bit

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1 and say something about why this came about? I mean,  
2 wasn't this something to do with this thermal lag  
3 business? All of these installations, like Hemmicks  
4 and Eastern, every time we look at them --

5 MR. WOLFGANG: Yes.

6 CHAIRMAN WALLIS: Well, isn't that the  
7 solution would be to have a proper barrier around  
8 these things?

9 MR. WOLFGANG: That's one solution, yes.

10 MEMBER DENNING: I don't see that as a  
11 total solution. I don't --

12 MR. WOLFGANG: That is one solution.  
13 Another solution is a separation, 20-foot separation.

14 CHAIRMAN WALLIS: But in the past, when we  
15 believed that this thermal lag worked, there wasn't a  
16 problem. Is that right?

17 MEMBER MAYNARD: No. I think the problem  
18 was still there then. This has been bounced around  
19 since I know at least the early '80s as an issue. I  
20 think the thermal lag, it helped in some cases where  
21 you could show separation in the trains, but it  
22 doesn't necessarily take care of you if you've got  
23 cables in the same area that are --

24 MEMBER DENNING: Right. They can still  
25 give you spurious actuation, regardless.

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1 MEMBER MAYNARD: Right.

2 MEMBER DENNING: Now, it may be -- do you  
3 have any comments on that?

4 MR. FRUMKIN: Yes. If you have the  
5 separation, you can still get spurious actuations.  
6 And that's a box that we're not in with the rule. The  
7 rule does not require that those be protected. So all  
8 plants have the flexibility for the unprotected train  
9 to mitigate through feasible and reliable manual  
10 actions those types of spurious actuations.

11 Now, if you were to get a spurious  
12 actuation that were to give you all incorrect  
13 indication and was not recoverable, then that would  
14 still have to be resolved because it would be a  
15 potential safety issue. But for the minor ones that  
16 we have been talking about that would be fairly easy  
17 to resolve through a manual operator action or there  
18 are procedural controls or something of that nature,  
19 that would not be a compliance issue per se.

20 MEMBER DENNING: Help me with that because  
21 I still don't quite understand it. So if you have a  
22 protected train and you get a spurious actuation from  
23 an unprotected train, then you have to analyze all  
24 combinations of spurious actuations still, don't you,  
25 that are possible in that unprotected train?

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1 MR. FRUMKIN: Alex, do you want to?

2 MR. KLEIN: Yes, I believe you do because  
3 the over-arching requirement of appendix R is to be  
4 able to safely bring your plant to safe shutdown. And  
5 if you don't know what's occurring in your plant, then  
6 you can't meet that over-arching high-level goal of  
7 achieving and maintaining safe shutdown of your plant.

8 MR. FRUMKIN: And I will just say that  
9 once you have your protective train, your protected  
10 train, your unprotected train has a very limited set  
11 of things that could hurt you.

12 Now, we're talking we have plenty of  
13 water. We have plenty of indication. We have plenty  
14 of everything. But now we might open, we might cause  
15 a drain letdown path to open or we might cause a pump  
16 to start, but we should be getting clear indication of  
17 that in the control room. And in the normal  
18 procedure, process, you'll be getting indication of  
19 these things happening. And they should be able to  
20 mitigate them fairly effectively.

21 Now, there may be some things that would  
22 be difficult to mitigate. And, as Alex says, they  
23 have to find those and find a way to mitigate them.

24 MEMBER DENNING: So you have lots of  
25 things you have to analyze, but the mitigation of it

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1 is probably not too severe for the plant, and the  
2 plant is allowed to do manual action on it.

3 Now, there is another set here. So what  
4 is the other set? Aren't you always required to have  
5 a protected train?

6 MR. FRUMKIN: Yes. And these plants don't  
7 have that protected train. In effect, all circuit and  
8 manual action findings or potential violations are  
9 lack of protection, lack of circuit protection.

10 MEMBER DENNING: Circuit separation.

11 MR. FRUMKIN: So when --

12 MEMBER DENNING: Separation of the --

13 MR. FRUMKIN: Right. So when a finding  
14 comes in, let's say we have that hypothetical finding,  
15 which opens up and drains down the RWST. The citation  
16 is going to be against 3G2, lack of separation and  
17 lack of protection.

18 Now, we don't require one protection  
19 method over another, but they didn't put a protection  
20 method in there to protect the -- well, RWST is a bad  
21 example because it is not a necessarily one-train  
22 system.

23 But let's say you have both trains being  
24 affected by a fire. And here this is probably what is  
25 the more likely scenario. One train is just going to

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1 be damaged by the fire and not work, and then the  
2 other train is going to have the spurious actuation.

3 We don't necessarily need both trains to  
4 have spurious actuations. So that's the situation.  
5 It doesn't have to be multiple spurious on multiple  
6 trains.

7 MEMBER APOSTOLAKIS: Have we agreed that  
8 the first bullet is not quite correct? We're asking  
9 for more than just information?

10 MR. FRUMKIN: It's clear.

11 MEMBER APOSTOLAKIS: Yes.

12 MEMBER DENNING: It just takes them a lot  
13 of work to do it. I think we all recognize that it's  
14 a request for information, but in order to produce  
15 that information, you have to do a lot of work.

16 MEMBER APOSTOLAKIS: Right. It sounds to  
17 me like the priest saying, you know, "I know you're a  
18 sinner, George. Now, you go away and think of all the  
19 ways in which you could be a sinner and come back and  
20 tell me what they are." I have thought about it.

21 CHAIRMAN WALLIS: It's already been  
22 analyzed.

23 MEMBER APOSTOLAKIS: I protected myself.

24 MEMBER DENNING: Let's go on. And I would  
25 like to hear the conservative risk analysis. And so

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1 would you give us a little presentation on the  
2 conservative risk analysis?

3 MR. FRUMKIN: Are you done with all of  
4 your slides?

5 MEMBER DENNING: Yes.

6 MR. WOLFGANG: Yes. I just want to say  
7 one thing. If we don't issue a generic letter, we'll  
8 have to use the inspection process behind these  
9 problems.

10 It will take longer. We estimate three  
11 triennials, nine years. And some risk-significant  
12 items may be missed. We don't know because the burden  
13 is put on us, instead of the licensee. I just want to  
14 bring it up.

15 MEMBER DENNING: Thank you.

16 MEMBER BONACA: Is it with regard to the  
17 90 days with the responses? I mean, how did you come  
18 up with the 90 days, recognizing that you have to go  
19 to award to provide these responses? Was there an  
20 evaluation that you performed?

21 MR. WOLFGANG: No.

22 MEMBER BONACA: I mean, can it be changed?

23 MR. WOLFGANG: It can be changed. It was  
24 an arbitrary period that we thought was --

25 MEMBER APOSTOLAKIS: Or you can reduce the

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1 requirement.

2 MR. WOLFGANG: Yes, or we can --

3 MEMBER APOSTOLAKIS: So we don't have  
4 these?

5 MR. FRUMKIN: No, you don't have these  
6 slides. We will be making them available.

7 MR. KLEIN: Just as a reminder, if I can  
8 just follow up on the 90-day issue and the comments in  
9 regard to that, we do have a bullet in there that, for  
10 licensees who can't meet that 90-day requirement, that  
11 within the 30 days, they come in and request an  
12 extension.

13 MEMBER MAYNARD: Yes. And I saw that in  
14 the generic letter. If it's a situation where you  
15 know 90 percent of the industry is not going to be  
16 able to do it, you might as well be able to pick a  
17 date where everybody is not having to do it. I'll be  
18 interested in hearing from the industry as to whether  
19 they think that is a burden or not. I think I am  
20 assuming it is, but it may not be. So I don't know.

21 MR. FRUMKIN: This is a bounding risk  
22 analysis for multiple spurious actuations. It was  
23 developed for this meeting by Ray Gallucci, Dr. Ray  
24 Gallucci, who is in the Fire Protection Section. And  
25 it's been presented as a paper for the American

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1 Nuclear Society presentation. I think this winter  
2 they're having a meeting.

3 I am the third string presenter of this  
4 document. Ray is the first string. Dr. Weerakkody is  
5 the second string. And I'm presenting out of  
6 necessity.

7 MEMBER DENNING: Is Ray here to get beaten  
8 upon if he --

9 MR. FRUMKIN: No. Ray is on inspection at  
10 Browns Ferry. So we have --

11 MEMBER APOSTOLAKIS: Last time he was here  
12 he --

13 MEMBER DENNING: No wonder he's at Browns  
14 Ferry.

15 MR. KLEIN: Let me clarify. He's on a  
16 program review at Browns Ferry. He's not on an  
17 inspection.

18 MR. FRUMKIN: Okay. I'm sorry. These  
19 slides will be made available. My understanding of  
20 this analysis is using an older plant PRA that Ray was  
21 involved in, he pulled out some of the important  
22 measures for some hot shorts. And he recombined them  
23 into multiple hot shots and, using a simplification  
24 process, determined a bounding risk analysis for those  
25 based on those important measures for one plant's PSA.

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1           So this is the typical older nuclear power  
2 plant, has a fire CDF of  $3.3^{-5}$ . And they used a hot  
3 short probability of .1. They had modeled 24 of the  
4 basic events. And that contributed about 5 percent to  
5 the fire CDF or  $1.8D^{-6}$ .

6           And then there were some systematically  
7 symmetric redundant train components that were chosen  
8 because I think they had more of a larger impact on  
9 the plant risk if they were to fail together. And  
10 that was a contribution of .03 to the fire CDF, those  
11 10 items.

12           MEMBER DENNING: Let's go slowly so we --

13           MEMBER APOSTOLAKIS: Yes.

14           MEMBER DENNING: -- understand what we  
15 have here.

16           MR. FRUMKIN: Okay.

17           MEMBER APOSTOLAKIS: Twenty-four hot short  
18 basic events above truncation. What does that mean?

19           MR. FRUMKIN: That in the model, the ones  
20 that had remained as important remained having  
21 importance measures in the model, that there were only  
22 24 hot shorts that remained there.

23           MEMBER APOSTOLAKIS: The core damage  
24 frequency due to hot shorts is  $1.8 \cdot 10^{-6}$  per year, it  
25 says.

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1 MR. FRUMKIN: Correct, assuming a hot  
2 short probability of .1.

3 MEMBER APOSTOLAKIS: Which was low.

4 MR. FRUMKIN: Which is low based on  
5 current data.

6 MEMBER KRESS: Okay. So one, it would be  
7 1.8 times  $10^{-5}$ .

8 MR. FRUMKIN: If you said 1.0, correct.

9 MEMBER DENNING: Now, you said that that's  
10 low, but don't forget here that now we're talking  
11 supposedly real nuclear power plants with fires where  
12 you would take into account the fact that the fire may  
13 not damage any cables, you know.

14 MR. FRUMKIN: Right. Well, this is from  
15 an --

16 MEMBER DENNING: Oh, this is --

17 MR. FRUMKIN: -- old fire PSA. So this  
18 does consider --

19 MEMBER DENNING: Yes, it does.

20 MR. FRUMKIN: -- many of those factors.

21 MEMBER DENNING: But saying that the  
22 probability of your hot short is .1 and saying, "Well,  
23 that is low," I think because we saw those other  
24 things where people say, "Well, it could be .6 or .2  
25 or something like that," --

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1 MR. FRUMKIN: Right.

2 MEMBER DENNING: -- and, therefore, this  
3 is low, that doesn't necessarily follow.

4 MR. FRUMKIN: I think this is the  
5 conditional hot short probability based on cable  
6 damage.

7 CHAIRMAN WALLIS: How about multiple  
8 shorts come into this?

9 MR. FRUMKIN: That is what we are going to  
10 be talking about.

11 CHAIRMAN WALLIS: This doesn't address  
12 that?

13 MR. FRUMKIN: No, no. Right. This is  
14 what this analysis is. So assuming that the  
15 components within each pair -- these are those ten  
16 items that have been paired -- have similar failure  
17 characteristics and locations, including their cable  
18 runs, again, this is a conservative assumption and  
19 that these comprise the full set of candidates for  
20 multiple spurious actuations that are not specifically  
21 modeled in the traditional IPEEEs as --

22 MEMBER APOSTOLAKIS: The number you showed  
23 us earlier assumes that these happen independently?

24 MR. FRUMKIN: Yes.

25 MEMBER DENNING: You know, I still don't

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1 understand the pairing. What is going on here? Is it  
2 ten corresponding to --

3 MEMBER APOSTOLAKIS: Ten of these?

4 MEMBER DENNING: Five paired components.

5 That means that there is a --

6 MEMBER APOSTOLAKIS: Redundant elements.

7 MEMBER DENNING: They're redundant  
8 elements.

9 MEMBER APOSTOLAKIS: Yes.

10 MR. FRUMKIN: I believe what they did is  
11 of these 24, they took out 10 of them that could when  
12 combined have an issue.

13 MEMBER APOSTOLAKIS: They are still  
14 located in the --

15 MEMBER DENNING: It could lead to  
16 problems.

17 MR. FRUMKIN: On this slide, they're  
18 independent.

19 MEMBER APOSTOLAKIS: Yes.

20 MR. FRUMKIN: But I think what we're going  
21 to do is we're going to try to take out that and look  
22 at them as pairs. So this is what we're going to do,  
23 form a bounding analysis to estimate the potential  
24 maximum CDF due to multiple spurious actuations for  
25 this typical older MPP, which I think is what the

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1 target, the goal is here.

2 And now we start getting into some  
3 formulas. Per pair, one hot short corresponds to  
4 train A and the other to train B. So that's how they  
5 were paired. And they appear in symmetrically paired  
6 cut sets.

7 So one cut set, the CDF of A -- and  
8 there's the formula for that -- and the CDF of B,  
9 which is the fire initiator, and then the hot short or  
10 random failure of one of the paired components and  
11 then the summation of the B. Okay?

12 CHAIRMAN WALLIS: And where do the  
13 multiple shorts come in?

14 MR. FRUMKIN: This is the formula for --

15 CHAIRMAN WALLIS: It's between two trains,  
16 but it's not multiple shorts in the same cable.

17 MR. FRUMKIN: That's correct, not in the  
18 same cable.

19 CHAIRMAN WALLIS: It's still independent.  
20 And this formula that you have here, the cut sets, are  
21 still assuming that the --

22 MR. FRUMKIN: I think so. They're not  
23 going to be independent of the same fire and the same  
24 damage time, but they're going to be independent  
25 failures affected by the same fire.

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1 MEMBER APOSTOLAKIS: Conditional on the  
2 fire.

3 MR. FRUMKIN: Conditional on the fire.

4 MEMBER SIEBER: Which assumes the fire  
5 covers both things.

6 MR. FRUMKIN: Right, which is a  
7 conservative assumption in this analysis.

8 MEMBER SIEBER: Truly conservative.

9 MR. FRUMKIN: Yes.

10 MEMBER SIEBER: Improbable.

11 MR. FRUMKIN: Well, it depends on the  
12 design of the plant, but yes, it's --

13 MEMBER APOSTOLAKIS: So if I want to  
14 couple them, then, I will assume that Fa and Fb are  
15 just F, one fire. Is that correct? And then I will  
16 have --

17 MEMBER DENNING: A is --

18 MEMBER APOSTOLAKIS: Otherwise they are  
19 still independent. I mean, the fire initiator must be  
20 the same.

21 MR. FRUMKIN: Well, let's just hope that  
22 your answer --

23 MEMBER APOSTOLAKIS: We assume two  
24 different fires.

25 MEMBER DENNING: We'll go to the next

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1 slide. And maybe it will become clear.

2 MEMBER SIEBER: It's a lot clearer in  
3 here.

4 MR. FRUMKIN: Okay. So, again, we have --

5 MEMBER APOSTOLAKIS: This .1 comes from?

6 MR. FRUMKIN: The .1 was the  
7 state-of-the-art when they did this PSA of --

8 MEMBER APOSTOLAKIS: I'll tell you where  
9 it comes from.

10 MR. FRUMKIN: Okay.

11 MEMBER APOSTOLAKIS: That's 20 years or so  
12 ago.

13 MEMBER DENNING: You're responsible for  
14 .1?

15 MEMBER APOSTOLAKIS: I saw it, and I said,  
16 "Well, gee. How did you come up with that?"

17 So they said, "Well, call this guy"  
18 somewhere in California.

19 I called this guy. He says, "Well, you  
20 know Sandia told us that."

21 "What Sandia?"

22 "This person."

23 So I called this person in Sandia. He  
24 says, "Well, I really don't know. It's this other  
25 guy."

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1           So I called this other guy. And he says,  
2 "You told us that."

3           (Laughter.)

4           MEMBER DENNING: So we're going to accept  
5 the .1.

6           MEMBER APOSTOLAKIS: It wasn't followed up  
7 at all. I mean, that was the funniest thing.

8           MR. FRUMKIN: The IPEEE assumed this hot  
9 short probability of .1. And then I believe we're  
10 doing a simplification of these factors here. And it  
11 actually gets very simple on the next slide, but if  
12 anyone really wants me to read through this, I can  
13 try.

14           MEMBER DENNING: You know what we'll do?  
15 Let's go to the bottom line.

16           MR. FRUMKIN: The bottom line.

17           MEMBER DENNING: And we'll have copies of  
18 this.

19           MR. FRUMKIN: Okay. Yes.

20           MEMBER DENNING: And we'll --

21           MR. FRUMKIN: Okay. This is, I believe --  
22 well, let's see.

23           MEMBER APOSTOLAKIS: No. This is --

24           MR. FRUMKIN: This is the bottom line  
25 here.

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1 MEMBER APOSTOLAKIS: Go back a little bit.

2 MR. FRUMKIN: I think --

3 MEMBER APOSTOLAKIS: This Fa plus Fb I  
4 don't understand. I thought it was going to be 1.5.

5 CHAIRMAN WALLIS: That's two fires, isn't  
6 it?

7 MEMBER APOSTOLAKIS: This is one or the  
8 other, yes, one or the other.

9 MR. FRUMKIN: Yes.

10 MEMBER APOSTOLAKIS: It doesn't really --  
11 I mean, he should have assumed one fire as far as I  
12 can tell. But, again, the --

13 MEMBER DENNING: We will look at it  
14 carefully.

15 MEMBER APOSTOLAKIS: -- connection is  
16 nothing, I mean, right?

17 MEMBER DENNING: We will look at it  
18 carefully later.

19 MR. FRUMKIN: Right. That would be a  
20 small difference.

21 MEMBER DENNING: And Ray's bottom line  
22 again is?

23 MR. FRUMKIN: Okay. Well, what he does  
24 here is he's taking out the  $1.1E^{-6}$ . And he's putting  
25 in this value or coming up with this value of .011,

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1 which is his surrogate simplification for all of the  
2 fires and his X factor, which is his fire and his  
3 failure factor.

4 MEMBER APOSTOLAKIS: He's bounding the  
5 random failures, right, by assuming a  $10^{-3}$ , right?

6 MR. FRUMKIN: I believe so.

7 MEMBER APOSTOLAKIS: Yes.

8 MR. FRUMKIN: Typical, right.

9 MEMBER APOSTOLAKIS: But he doesn't know  
10 how many -- oh, this is a bound on all random failures  
11 that are required.

12 MR. FRUMKIN: Yes.

13 MEMBER DENNING: Continue. Let's see.

14 MR. FRUMKIN: Okay. And now he's talking  
15 about the dual failures. Any of the ten paired hot  
16 shorts would appear in the cut sets. And Fa is the S,  
17 which is your severity factor, which going to reduce  
18 your likelihood of more hot shorts, which is the  
19 likelihood of having a big fire that's going to cause  
20 this damage.

21 CHAIRMAN WALLIS: Which affects both  
22 trains?

23 MR. FRUMKIN: Right. And then your  
24 various factors, A hot, B hot short, and then your  
25 random factors.

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1 MEMBER APOSTOLAKIS: Why square? Why A  
2 hot times A hot? It still assumes that they're  
3 independent events, right?

4 CHAIRMAN WALLIS: Well, that is the A hot  
5 times B hot --

6 MEMBER DENNING: It is going to take us  
7 some time to really work through this. Rather than do  
8 this here, --

9 MR. FRUMKIN: Okay.

10 MEMBER DENNING: -- let's go see Ray's  
11 bottom line.

12 MR. FRUMKIN: Okay. The bottom line is  
13 here.

14 MEMBER APOSTOLAKIS: All right.

15 MR. FRUMKIN: So for his choice of fires,  
16 for severity factor, I think he used a .1 for this  
17 extreme fire, which is an S.

18 CHAIRMAN WALLIS: Why is .1 extreme? It  
19 could be .5.

20 MR. FRUMKIN: Oh, no, no, no. This is for  
21 the likelihood of a large fire.

22 CHAIRMAN WALLIS: Yes. But just asking  
23 George Apostolakis by telephone tag --

24 MR. FRUMKIN: Oh, no. This is not his .1.

25 CHAIRMAN WALLIS: I thought it was his .1.

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1 MR. FRUMKIN: It's somebody else's .1.

2 MEMBER APOSTOLAKIS: This is from one of  
3 my students.

4 MR. FRUMKIN: That's right. Right. This  
5 .1 is from very likely the fire protection STP, which  
6 says that severe fires happen or ten percent of all  
7 fires that happen are severe, which is, again, a  
8 conservative number based on the state-of-the-art,  
9 which is the 6850 analysis.

10 But that's what we're doing with -- I  
11 mean, this is no question about it. This is a  
12 bounding analysis.

13 CHAIRMAN WALLIS: The ones that cause hot  
14 shorts?

15 MR. FRUMKIN: No. Instead of using a  
16 severity factor of one, assuming that all fires will  
17 cause the damage, we're only assuming that ten percent  
18 of the fires will cause the damage to cause hot short.  
19 So there are many different ways of severity --

20 MEMBER APOSTOLAKIS: So this .011, .011,  
21 is the frequency of fire or, no, this is from the  
22 random failure?

23 MR. FRUMKIN: Right.

24 MEMBER APOSTOLAKIS: According to one is  
25 one?

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1 MR. FRUMKIN: That's the severity factor.

2 MEMBER APOSTOLAKIS: What is the frequency  
3 of fire?

4 MR. FRUMKIN: What I believe he has done  
5 is I believe he has back-calculated through his  
6 simplification that .1 that he used. And he's turned  
7 that, the whole -- all of his important measures into  
8 this .011.

9 MEMBER APOSTOLAKIS: So that includes the  
10 frequency of fire?

11 MR. FRUMKIN: I believe so.

12 MEMBER APOSTOLAKIS: That's a pretty high  
13 number.

14 MR. FRUMKIN: Yes.

15 MEMBER DENNING: We are going to look at  
16 this carefully, but his bottom line is saying, well,  
17 what this could do in this particular case is it could  
18 have increased by a factor of three the fire damage  
19 frequency.

20 MR. FRUMKIN: I think what he's trying to  
21 say here is that when he back-calculates from his  
22 importance measures and then he combines these pairs,  
23 that -- and this is the bottom line here -- he can  
24 have a maximum of  $10^{-4}$  per year due to these pairs of  
25 hot shorts.

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1 MEMBER DENNING: And without it, they had  
2 3 times  $10^{-5}$  is what this plant did.

3 MR. FRUMKIN: Yes. That's the whole fire  
4 risk for the plant, is 3 times  $10^{-5}$ . So this could be  
5 dominating.

6 MEMBER APOSTOLAKIS: But why couldn't you  
7 go to an actual PRA and fix, instead of whatever they  
8 had, and see what happens, rather than doing this  
9 undue analysis? I mean, there are detailed fire PRAs  
10 out there.

11 MR. FRUMKIN: We don't actually have one  
12 in the office. He did have this information available  
13 to him.

14 MEMBER DENNING: What I would like to do  
15 is we would definitely like copies. Don't go  
16 anywhere.

17 MR. FRUMKIN: Okay.

18 MEMBER DENNING: And I don't think you  
19 have to read that. What we would like -- I mean, you  
20 can actually --

21 MR. FRUMKIN: Well, here his last slide is  
22 at least for a typical older nuclear power plant, one  
23 cannot a priori dismiss multiple hot shorts of being  
24 of lower significance.

25 MEMBER DENNING: Okay.

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1 MEMBER APOSTOLAKIS: Well, I would like to  
2 see the paper, please. No, no. Give me a copy.

3 MEMBER DENNING: Right. Yes, if we may.  
4 What we would like to do now is we would like to hear  
5 now from NEI, if we could. Don't run away, Research.

6 MEMBER APOSTOLAKIS: Don't anybody go  
7 away.

8 MEMBER DENNING: Don't anybody leave town  
9 other than me, but I would definitely like to make  
10 sure we have plenty of time to hear from NEI.

11 MEMBER APOSTOLAKIS: That's what I call  
12 running and meeting with --

13 MEMBER DENNING: The policeman is asked to  
14 lock the doors.

15 MEMBER APOSTOLAKIS: We have a cop  
16 outside?

17 MEMBER DENNING: And, Alex, you don't have  
18 handouts, but we can make them. Is that a true  
19 statement?

20 MR. MARRION: No, I do not have handouts.  
21 I do have a couple of comments.

22 MEMBER DENNING: You have comments?

23 MR. MARRION: Yes.

24 MEMBER DENNING: But you don't have any  
25 papers?

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1 MR. MARRION: No.

2 MEMBER DENNING: Okay. Please proceed.

3 MR. MARRION: Good morning. My name is  
4 Alex Marrion. I am a Senior Director of Engineering  
5 at NEI, and I appreciate the opportunity to offer a  
6 couple of comments on our perspectives on what we  
7 heard this morning.

8 Before I begin, I want to point out that  
9 we have two utility representatives, one from Progress  
10 Energy and one from Duke Power, who represent the two  
11 pilot plants for the application of NFPA 805.

12 And if the Committee so desires, I think  
13 it may be useful for you to understand the  
14 implications of this generic letter on the NFPA 805  
15 risk-informed application process. And I'll defer to  
16 you to --

17 MEMBER DENNING: We so desire.

18 MR. MARRION: Okay. Very good. Now I'll  
19 ask them to step up when I finish my comments.

20 To get back to Dr. Apostolakis' --  
21 George's comment, --

22 (Laughter.)

23 MR. MARRION: -- the test protocol and the  
24 issue of having cables exposed in the flaming region,  
25 I don't have any direct knowledge of that discussion

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1 with the NRC staff at the time we developed the test  
2 protocol. This was the first I heard of it, but I'll  
3 look into it. And we'll try to get an answer to you  
4 at the end of the week.

5 I do want to make it clear that we believe  
6 the multiple spurious actuation is a new regulatory  
7 position that results in significant impact on utility  
8 licensees, not only on the Appendix R, the NUREG 0800  
9 plants but also on the NFPA 805 plants.

10 The impact is significant in that it  
11 changes the methodologies that the utilities have  
12 credited in their licensing basis over the last 20  
13 years. So the licensing basis has to change.

14 Now, with that, it's perfectly appropriate  
15 for the NRC to say, "There's new information that has  
16 been brought to bear on this topic. And we have a new  
17 position." That's fine. But the NRC must bear the  
18 burden of demonstrating the safety impact of that new  
19 position and do a regulatory analysis to substantiate  
20 it because of the significant implications on the  
21 utility licensee design basis.

22 That's straightforward, but one thing that  
23 this position does not take into account is the  
24 fundamental elements of defense-in-depth relative to  
25 fire protection. What I'm talking about is the

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1 actions that are taken by licensees in preventing  
2 fires from occurring and detecting a fire when it does  
3 occur, having systems and personnel to respond to the  
4 fire to mitigate the consequences of the fire,  
5 suppression and detection systems, and then ultimately  
6 recovering the plant to assure that you can get into  
7 a safe condition.

8 We understand there is value to looking at  
9 risk-informed approaches and changes and assumptions  
10 and evaluating them accordingly, but I would recommend  
11 that we not lose sight of the defense-in-depth  
12 concepts as we go through this process going forward.

13 This generic letter is another example of  
14 what is fundamentally flawed with fire protection  
15 regulations and has been a problem with fire  
16 protection regulations and the associated regulatory  
17 process over the last 25 or 35 years.

18 And by that, I mean we have a continuous  
19 evolution of NRC positions and expectations that are  
20 addressed in a somewhat informal manner. And by that,  
21 I mean use of generic communications to articulate  
22 regulatory positions is, quite frankly, inappropriate.

23 New regulatory positions should be  
24 evaluated in terms of safety impact or clearly  
25 demonstrating the compliance issue associated with

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1 that new position. Then that has to be made publicly  
2 available so that the licensees can understand what  
3 these new positions are and what the basis for the  
4 positions are.

5 Historically in fire protection, it's been  
6 a plant-specific fire protection engineer from the  
7 licensee to an NRC inspector agreement of what the  
8 understanding is relative to an interpretation. And  
9 that is the problem that we're trying to fix. That's  
10 why we are so firm in our comments going forward,  
11 because fundamentally, gentlemen, if we don't address  
12 or we don't identify resolution to the spurious  
13 actuation issue today, it will be an issue for the  
14 NFPA 805 plants.

15 Going to 805 does not provide a resolution  
16 to this issue today because there is no understood  
17 methodology that can address the staff's position. I  
18 want to make that very clear.

19 MEMBER APOSTOLAKIS: Is this the  
20 open-ended issue that we discussed earlier?

21 MR. MARRION: Yes, yes. The comments made  
22 about CRGR approval of this generic letter, as an  
23 external stakeholder, that essentially is meaningless  
24 to us, reason being we are not privy to any kind of  
25 disciplined process that is used by CRGR or anyone

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1 within the NRC that clearly demonstrates this is the  
2 basis for the safety concern or this is the basis for  
3 the compliance concern.

4 What we have seen over the years -- and  
5 this is another example -- where the preferred route  
6 appears to be, well, let's make it a compliance  
7 concern because we as a regulatory agency, the NRC,  
8 can interpret the regulations. We have the right to  
9 interpret the regulations, et cetera, which is fine,  
10 but let's put the interpretation on paper. Let's  
11 identify resolution path so we have a common  
12 understanding going forward. We don't have that today  
13 on this particular issue.

14 Lastly, I would like to say that there  
15 isn't a generic letter that is simply a request for  
16 information. It should be clear from the discussion  
17 this morning that this generic letter basically  
18 imposes a new regulatory requirement that has  
19 significant impact on the licensing basis of current  
20 plants. That is not a request for information.

21 Those are the comments that I wanted to  
22 make this morning. I don't know if you have any  
23 questions on anything I said.

24 MEMBER DENNING: Yes, we do have some.  
25 One of them has to do with the timing, the 90 days,

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1 and the timing required to do the kind of analysis  
2 that's being requested there. Do you have a feeling  
3 as to what an appropriate time would be?

4 I mean, there's a timing that says, are  
5 you in compliance with this, which, regardless of this  
6 question, whether it's a new regulation or an old,  
7 there's no question the plant can determine that  
8 fairly quickly. But doing the entire analysis and  
9 determining what affected SSCs are, do you have any  
10 indication from the plants as to how much time that  
11 might take and what an appropriate time frame would be  
12 for a response like --

13 MR. MARRION: I don't have the information  
14 to answer the question, but I would submit that the  
15 next two individuals may be able --

16 MEMBER DENNING: May be of help on it?

17 MR. MARRION: -- to give you their  
18 perspectives.

19 MEMBER DENNING: Okay. Good.

20 MEMBER MAYNARD: Could I just --

21 MEMBER DENNING: Yes?

22 MEMBER MAYNARD: Your perspective comment  
23 was made that if the generic letter is not issued,  
24 then it would just have to be dealt with in inspection  
25 space. Do you have any comment on that?

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1 MR. MARRION: It is being dealt with in  
2 inspection space. Now, what we don't have is an  
3 external stakeholder. When I mention "we," I'm  
4 speaking of NEI and the industry. What is the safety  
5 case or what is the compliance case? And we haven't  
6 seen evidence of that clearly demonstrated that NRC  
7 action in this particular area is necessary in an  
8 expedited manner.

9 VICE CHAIRMAN SHACK: Just to address your  
10 methodology question, apparently you can deal with  
11 multiple actions if they come sequentially. So you  
12 have a methodology for that. And you're arguing that  
13 there isn't a methodology.

14 So it isn't necessarily the open-endedness  
15 of it that's the problem?

16 MR. MARRION: There isn't a methodology  
17 for addressing all spurious actuations in a given  
18 fire. Utilities had --

19 VICE CHAIRMAN SHACK: You can address them  
20 one at a time.

21 MR. MARRION: You can address them one at  
22 a time. And I would ask that the two utility  
23 representatives explain their methodology for circuit  
24 analysis. I think we would find that very insightful.

25 MEMBER DENNING: Good.

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1 MR. MARRION: But it's changed. And then  
2 what I would like to do is ask Dave Miskiewicz from  
3 Progress Energy and Harry Barrett from Duke Power.

4 CHAIRMAN WALLIS: I would bring up the  
5 point before you leave --

6 MR. MARRION: Yes?

7 CHAIRMAN WALLIS: You talked about the  
8 role of a generic letter and whether it just requests  
9 information. We have another generic letter on sumps,  
10 which you may be aware of, right?

11 MR. MARRION: I am generally aware of that  
12 one.

13 CHAIRMAN WALLIS: It not only requested  
14 information. It requested analysis, and it requested  
15 plans. And, in fact, it's resulted in large changes  
16 in the plant by a result of a generic letter.

17 MR. MARRION: Yes.

18 CHAIRMAN WALLIS: So it's not as if this  
19 is a unique generic letter, which is actually asking  
20 plants to do much more than just supply information.

21 MR. MARRION: My only point is a request  
22 for information as this generic letter is  
23 characterized as a mischaracterization of what its  
24 impact is.

25 CHAIRMAN WALLIS: Well, it clearly isn't

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1 that. I mean, it says a request for information and  
2 taking additional actions. I mean, the sentence asks  
3 for more than just information.

4 MR. MARRION: Okay?

5 MEMBER DENNING: Okay. Let's have our  
6 visitors come up.

7 MR. FRUMKIN: If I could add? This is Dan  
8 Frumkin. Just one point. The inspections started  
9 again in January of 2005, but there is still currently  
10 enforcement discretion for all circuit findings. And  
11 so there may be a perception that this has not turned  
12 into an issue yet because of a lack of enforcement in  
13 this area.

14 So starting in September 2006, enforcement  
15 will proceed for plants that do not have enforcement  
16 discretion under NFPA 805. So I just want to put that  
17 out there that currently there are no enforcement  
18 actions in this area for plants that take compensatory  
19 measures and have correction action plans.

20 MEMBER DENNING: Introduce yourselves,  
21 please.

22 MR. BARRETT: Good morning. My name is  
23 Harry Barrett. I work at Duke Power. I'm the  
24 three-site lead for NFPA 805 transition for all three  
25 of these sites in Duke Power's nuclear fleets. I just

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1 wanted to say a few words about the multiple spurious  
2 issue as it affects 805.

3           Although 805 is a risk-informed,  
4 performance-based rule, it is based on your current  
5 licensing basis going forward. And if that is  
6 questionable, then your regulatory foundation that  
7 you're billing it on would be questionable in 805,  
8 which ends up leading to a lot more effort and a lot  
9 more analysis required for that.

10           So this multiple spurious issue is adding  
11 a significant amount of paperwork and analysis to 805  
12 transition. The original concept was you would take  
13 your fire protection licensing basis, map it over to  
14 the 805 requirements, and it was pretty much just a  
15 paper transition.

16           With this new multiple spurious and the  
17 complications that that adds to the fire PRA, we're  
18 looking at a significant amount of engineering effort  
19 that goes into that.

20           It's going to take us over two years to do  
21 the transition for Oconee, which is the first plant.  
22 And a lot of that, most of that, is the PRA in the  
23 multiple spurious issue.

24           MEMBER APOSTOLAKIS: Do you agree that it  
25 is an issue?

1 MR. BARRETT: I agree that it needs to be  
2 looked at. I have not seen a multiple spurious  
3 scenario that is risk-significant yet.

4 MEMBER APOSTOLAKIS: Do any of your plant  
5 have a detailed fire PRA?

6 MR. BARRETT: We have a fire PRA. We have  
7 --

8 MEMBER APOSTOLAKIS: Not IPEEE, though?

9 MR. BARRETT: We had an early '80s vintage  
10 fire PRA, but we are putting together a NUREG 6850,  
11 the new version of it.

12 MEMBER APOSTOLAKIS: Okay. So --

13 MR. BARRETT: We're doing that now.

14 MEMBER APOSTOLAKIS: It would be, then,  
15 possible for you to go back to that PRA and see what  
16 happens if you assume multiple --

17 MR. BARRETT: It assumed multiple in the  
18 original analysis. To use the core melt, we needed to  
19 use multiples for that particular analysis. So it  
20 included --

21 MEMBER APOSTOLAKIS: The number came out  
22 okay?

23 MR. BARRETT: It came out relatively high.  
24 I don't remember the exact number, but fire was a  
25 fairly significant contributor to risk in the --

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1 MEMBER APOSTOLAKIS: Not fire overall,  
2 but, I mean, this particular mode with --

3 MR. BARRETT: Spurious?

4 MEMBER APOSTOLAKIS: Yes.

5 MR. BARRETT: If I remember right, many of  
6 the combinations that we analyzed were within the  
7 bounds of the Appendix R analysis originally for  
8 control room evacuation. The main fire area that we  
9 got into trouble with the IPEEE or the fire PRA, the  
10 original one, was in our cable shaft going up to the  
11 control room, where we had just about every cable in  
12 the plant going through one area. And so --

13 MEMBER APOSTOLAKIS: It seems to me that  
14 --

15 CHAIRMAN WALLIS: Did you assume multiple  
16 spurious actuations, simultaneous, and all of this?

17 MR. BARRETT: In that particular PRA, we  
18 ended up having to go to multiple spurious actuations  
19 in order to get the core damage.

20 CHAIRMAN WALLIS: Okay. Including  
21 simultaneous actuations.

22 MEMBER APOSTOLAKIS: So it would be  
23 interesting, then, to compare your numbers and  
24 analysis with the bounding analysis that the NRC staff  
25 has done to see which one makes sense.

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1 I mean, it seems that we do have a body of  
2 knowledge there that at least I as a member of this  
3 Committee don't seem to have access to. I don't know  
4 whether the rest of the members are familiar with it,  
5 but I doubt it.

6 So, I mean, it would be nice to see that,  
7 especially since you have done it already, I mean.

8 MR. BARRETT: Yes. The original analysis  
9 was nowhere the rigor that 6850 requires now.

10 MEMBER APOSTOLAKIS: I understand that.  
11 I mean, you --

12 MEMBER SIEBER: It is just one plant. So  
13 it's not clear to me how you can extend that to some  
14 --

15 MEMBER APOSTOLAKIS: Yes. But it provides  
16 a basis for judging what Ray Gallucci did.

17 MEMBER SIEBER: It gives you an idea.

18 MEMBER APOSTOLAKIS: Yes. And also what  
19 kind of effort it takes to do it because under NFPA  
20 805, it seems to me that if you find -- as I recall.  
21 Maybe I'm wrong. As I recall, you're right. You're  
22 supposed to meet the regulations, but if you don't  
23 meet some of them, then you can argue in risk space.

24 MR. BARRETT: Right.

25 MEMBER APOSTOLAKIS: Right?

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1 MR. BARRETT: Right.

2 MEMBER SIEBER: You don't need to.

3 MEMBER APOSTOLAKIS: But you don't need to  
4 go back and comply. So, I mean, there is a way out of  
5 it depending on the quality of the risk assessment.

6 MEMBER SIEBER: That would be a basis for  
7 an exemption, but you can't just sit there and do  
8 nothing.

9 MEMBER APOSTOLAKIS: But is that  
10 consistent with a statement that it does a lot of  
11 work, paperwork? I mean, if you already have the PRA,  
12 why does it add a lot of work? But you just said  
13 that, right?

14 I'm sorry. I don't remember your name.

15 MR. BARRETT: Harry.

16 MEMBER SIEBER: The PRA is not  
17 state-of-the-art.

18 MR. BARRETT: Right. The original PRA is  
19 not state-of-the-art.

20 MEMBER SIEBER: They have to do the work.

21 MR. BARRETT: The one that they are doing  
22 now is state-of-the-art. They're using 6850 and --

23 MEMBER APOSTOLAKIS: When do you expect it  
24 to be completed?

25 MR. BARRETT: It should be complete by

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1 probably June of next year.

2 VICE CHAIRMAN SHACK: When you do your  
3 state-of-the-art PRA, you're going to consider  
4 multiple actuations, right?

5 MR. BARRETT: Yes.

6 MEMBER APOSTOLAKIS: Yes. So, I mean, is  
7 it clear to everyone? I mean --

8 MR. BARRETT: We are taking significant  
9 efforts to make sure we get our best chance at finding  
10 those multiple spurious risk --

11 VICE CHAIRMAN SHACK: But it seems to me  
12 that anybody doing a fire PRA is going to have to  
13 consider multiple --

14 MEMBER DENNING: Do they have to consider  
15 them as comprehensively as here? Because they will  
16 have screening criteria. And I guess can you tell me  
17 if you weren't -- you know, suppose you were not  
18 heading towards that.

19 If you are sitting there and you had to do  
20 this analysis, how long would it take you to do this  
21 analysis? And how difficult would it be to -- would  
22 you have to modify the plant to be able to accommodate  
23 it?

24 MR. BARRETT: I am not sure about that.  
25 What we would probably end up doing is using the

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1 guidance in NEI-0001, chapter 4, which is the risk  
2 analysis piece of that, which is, in essence, doing a  
3 mini PRA for the --

4 MEMBER DENNING: But you're not allowed to  
5 use that. I mean, by this generic letter, you're only  
6 allowed to do that if you're then going to look for  
7 exemptions.

8 MR. BARRETT: Right, yes. You're not  
9 doing 805. That's your only other --

10 MEMBER DENNING: Yes.

11 MR. BARRETT: I mean, you need to modify  
12 the plant or you --

13 MEMBER DENNING: Modify the plant. How  
14 long would it take you to do that analysis in --

15 MR. BARRETT: Guessing, I would say  
16 probably a year.

17 MEMBER DENNING: Probably a year. I mean,  
18 what is in here says 90 days.

19 MR. BARRETT: No way.

20 MEMBER DENNING: There's no way?

21 MR. BARRETT: No way.

22 MEMBER DENNING: You would think that --

23 MEMBER SIEBER: Well, you can tell in 90  
24 days roughly how long you think it's going to take you  
25 to do it.

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1 MEMBER DENNING: Absolutely.

2 MEMBER SIEBER: But that's not what  
3 they're asking.

4 MEMBER DENNING: But that's not what  
5 they're asking.

6 MR. BARRETT: I mean, your choices are to  
7 take your safe shutdown analysis and just say that  
8 everything in a given fire areas fails immediately.

9 MEMBER SIEBER: That is the way you used  
10 to do it.

11 MR. BARRETT: And you can't do it.

12 MEMBER SIEBER: No.

13 MR. BARRETT: I mean, with the acceptance  
14 criteria you have in Appendix R, having water level go  
15 out of the pressurizer, you can do that with just a  
16 couple of spurious actuations. If you do all of them,  
17 you're never going to make it. So I don't know how  
18 you do that in 90 days.

19 MR. WOLFGANG: This is Bob Wolfgang with  
20 again --

21 MEMBER DENNING: Go ahead, Bob.

22 MR. WOLFGANG: The 90 days, what we have  
23 currently in the generic letter is for functionality  
24 assessment. To submit any exemption requests,  
25 amendment requests, that's the six-month period.

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1 MEMBER DENNING: Yes, but what I am  
2 missing is to do the functionality assessment, don't  
3 you have to do basically the analysis?

4 MR. BARRETT: Yes. That is essentially an  
5 operability assessment. Are components operable? In  
6 order to know that, you have to do the analysis to  
7 know what gets damaged and when. There's no way  
8 you're going to do that in a short time, no way.

9 MEMBER DENNING: Dave, did you want to  
10 make some comments?

11 MEMBER SIEBER: Before we switch, one  
12 thing that you said that I think is important is you  
13 really can't get the core damage unless you have  
14 multiple spurious actuations.

15 MR. BARRETT: We have some singles that  
16 get us in trouble, and we're going to have to fix  
17 those. But as far as getting into the core damage,  
18 I'm not even sure --

19 MEMBER SIEBER: This would be opposing  
20 trains, too, right?

21 MR. BARRETT: Well --

22 MEMBER SIEBER: Train A, train B pairs.

23 MR. BARRETT: By the fire PRA methodology,  
24 you're really not even worrying about 3G2 or 3G3  
25 anymore. You're looking at fires anywhere and damage

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1 to all of the circuits.

2 MEMBER SIEBER: Right.

3 MR. BARRETT: So you're really looking at  
4 controlling fires and cable room fires and all of  
5 that. And, you know --

6 MEMBER SIEBER: But if you were to make  
7 the assumption that you only have one spurious  
8 actuation, you wouldn't get the core damage. And you  
9 could just say, "I don't need to do anything," right?

10 MEMBER APOSTOLAKIS: Well, it depends on  
11 what else fails.

12 MR. BARRETT: Yes. I think it depends  
13 largely on --

14 MEMBER SIEBER: It would be an on-fire --

15 MR. BARRETT: -- what other failures --

16 MEMBER SIEBER: -- a non-fire-induced  
17 failure, right?

18 MEMBER DENNING: There has to be a core  
19 damage frequency, though. I mean, when you said you  
20 wouldn't get core damage frequency with a single  
21 failure, you have to because you have other unrelated,  
22 but it's just very low.

23 MR. BARRETT: Also we are talking hot  
24 shorts here, but you also have fire-related damage,  
25 which takes the component out of service, which is not

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1 included in that spurious operation probability.

2 So it's a much more complicated things to  
3 get your arms around as far as loss of all electrical  
4 power, loss of indication, and all of that. It's more  
5 than that.

6 MEMBER DENNING: Yes?

7 MEMBER SIEBER: Thanks.

8 MEMBER DENNING: Dave?

9 MR. WOLFGANG: Excuse me.

10 MEMBER DENNING: Yes?

11 MR. WOLFGANG: This is Bob Wolfgang again.

12 So Duke's response to this generic letter  
13 would be we're addressing it. We're transition to  
14 NFPA 805. And we're going to address multiple  
15 spurious actuations in that transition.

16 MR. BARRETT: Yes, sir.

17 MR. WOLFGANG: And that is the total  
18 response we're looking for from --

19 MR. BARRETT: We will give you a schedule  
20 of when we think that will be done, yes.

21 MEMBER DENNING: Okay. If that is what  
22 you are asking for, you're going to have to change the  
23 generic letter.

24 MR. BARRETT: No.

25 MEMBER DENNING: My interpretation. Well,

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1 we'll look at that.

2 Dave, why don't you go ahead and say a few  
3 words?

4 MR. MISKIEWICZ: Okay. My name is Dave  
5 Miskiewicz. I'm from Progress Energy. I'm the lead  
6 PRA supporting the transition to 805 at all of our  
7 units.

8 MEMBER APOSTOLAKIS: PRA?

9 MR. MISKIEWICZ: I'm the lead PRA engineer  
10 supporting our transition.

11 MEMBER APOSTOLAKIS: I thought you said  
12 "elite."

13 (Laughter.)

14 MR. MISKIEWICZ: That does sound good.

15 A lot of the discussion I'm hearing, my  
16 perspective is probably a little bit different than  
17 the normal compliance.

18 MEMBER APOSTOLAKIS: That's why we want  
19 it.

20 MR. MISKIEWICZ: You know, there is  
21 uncertainty. And I am used to dealing with the  
22 uncertainty as how much probability I can assign to  
23 something, can I take credit for these actions and all  
24 the various things on there.

25 One of the things that strikes me is when

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1 I look at the bounding analysis and it seems like  
2 we're trying to get the best of both worlds. We want  
3 to address everything in totality and also assure that  
4 we don't have that risk.

5 You know, when I deal with traditional  
6 design basis, we are allowed one single failure. And  
7 we assume no off-site power. And we give an  
8 initiating event that happens, and that is a given.

9 PRA, we will look at multiple failures.  
10 And we may find things that are more vulnerable that  
11 weren't even addressed under compliance. And I see  
12 kind of a similar thing here except for instead of  
13 saying, "Address a single failure," we're looking at  
14 "You've got to find them all."

15 And that just seems like an impossible  
16 task. Even in the PRA world, we can model a lot of  
17 stuff, but we're still not going to get them all. But  
18 we try to find the significant things. We're trying  
19 to gear down to get the significant issues.

20 As far as the workload goes that I see on  
21 the generic letter, I think it would be significant.  
22 I'm not the circuit analysis person but when I start  
23 throwing in non-currently credited equipment into that  
24 list that I want circuits routed for and cables routed  
25 for, it is a big workload for the electrical guys who

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1 are going to be doing that work. And I would see that  
2 as a resource drain on the overall transition effort  
3 for me.

4 In fact, if I saw them, you know, all of  
5 a sudden, focusing on one area and not another area,  
6 I'm not even sure how they would be able to get all of  
7 them without doing the PRA perspective.

8 MEMBER APOSTOLAKIS: I am a little bit --  
9 I don't know what the right word is, but we keep  
10 talking about the workload. It seems to me we should  
11 be talking about the real issue.

12 Is there a real issue here? Is there a  
13 contributor to risk that we have not handled in the  
14 past or managed well? I mean, the workload I'm sure  
15 you will agree, too, it's a major contributor to risk.  
16 We have to do something about it.

17 MR. MISKIEWICZ: I agree.

18 MEMBER APOSTOLAKIS: And, you know, the  
19 thing that made me happy with Duke is that they are  
20 doing the PRA. They will consider the multiple hot  
21 shorts or spurious situations. Is your company doing  
22 something similar or --

23 MR. MISKIEWICZ: We are doing the PRA.  
24 And we're going to in the PRA model the hot shorts,  
25 the spurious actuations.

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1 MEMBER APOSTOLAKIS: According to the  
2 latest information we have and everything?

3 MR. MISKIEWICZ: When we say important,  
4 too, it's almost, you know --

5 MEMBER APOSTOLAKIS: You're not going to  
6 use .1? You're going to use .6, for example?

7 MR. MISKIEWICZ: We'll use whatever the  
8 methodology recommends.

9 MEMBER BONACA: You can go to Professor  
10 Apostolakis if you remember.

11 MEMBER APOSTOLAKIS: Give me a call. I'll  
12 tell you.

13 (Laughter.)

14 MR. MISKIEWICZ: It's .1. And we're  
15 working through those issues, but even doing that is  
16 going to be limited somewhat. You know, there are  
17 screening techniques and things used that we're going  
18 to work our way through as to which circuits really  
19 need to be evaluated.

20 MEMBER DENNING: Do you think the approach  
21 is clearly defined as to how you come up with a  
22 probability for these actuations?

23 MR. MISKIEWICZ: Right.

24 MEMBER DENNING: There is some randomness  
25 that one assumes in terms of which circuits can

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1 connect with which other circuits to --

2 MR. MISKIEWICZ: I think what we know now  
3 is better than what we knew ten years ago when we were  
4 dealing with this.

5 MEMBER DENNING: Yes. But it isn't  
6 obvious to me even what the best approach is to doing  
7 that within the fire PRA, let alone deterministically.

8 MEMBER APOSTOLAKIS: So the position,  
9 then, of at least you two gentlemen and maybe the  
10 industry is that this generic letter is unnecessary,  
11 that you are handling the issue of multiple spurious  
12 actuations via the PRA and as you transition to it --  
13 are you transitioning to 805?

14 MR. MISKIEWICZ: Yes, we are.

15 MEMBER APOSTOLAKIS: As you transition to  
16 805, you may have to come back to the NRC and, using  
17 risk arguments, request an exemption of some sort. Is  
18 that your position?

19 MEMBER BONACA: Well, I heard it  
20 differently.

21 MEMBER APOSTOLAKIS: What?

22 MEMBER BONACA: I heard it differently.  
23 I heard simply that the burden should be on the NRC to  
24 perform. Okay.

25 MEMBER APOSTOLAKIS: But they are handling

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1 it already.

2 MEMBER BONACA: Yes.

3 MR. BARRETT: We are handling multiple  
4 spurious in the PRA as part of the 805 transition.

5 MEMBER APOSTOLAKIS: And then what?

6 MR. BARRETT: And then we're going to  
7 follow the industry guidance and the regulatory  
8 guidance provided by the NRC. And depending upon  
9 where the thresholds fall in relation to the  
10 self-approval thresholds, if it's less than the  
11 self-approval threshold, then we'll end up  
12 self-approving an exemption in accordance with the NRC  
13 rules for 805 implementation.

14 MEMBER APOSTOLAKIS: Right, right.

15 MR. BARRETT: If it's over that threshold,  
16 then we'll end up having to --

17 MEMBER APOSTOLAKIS: Come back.

18 MR. BARRETT: -- contact the staff and  
19 work out whether we have to modify or whether we can  
20 leave the situation as is.

21 MEMBER APOSTOLAKIS: The conclusion one  
22 can draw from this is that you believe that this  
23 generic letter is unnecessary because there is already  
24 a process in place. Is that correct?

25 MR. BARRETT: For 805, for their plants.

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1 Not everyone is --

2 MEMBER APOSTOLAKIS: Why wouldn't another  
3 plant apply the same thing?

4 MEMBER SIEBER: It is an optional process.  
5 Some plants --

6 MEMBER APOSTOLAKIS: Oh, they don't --

7 MEMBER SIEBER: -- may decide not to do  
8 anything at all.

9 MEMBER APOSTOLAKIS: If they don't  
10 transition to 805, you mean?

11 MEMBER SIEBER: Yes.

12 MR. MARRION: If I may, Dr. Apostolakis,  
13 there are 40 plants that have submitted letters of  
14 intent to the NRC. The resolution of this issue for  
15 the 805 plans has yet to be determined. The approach  
16 is the use of the PRA, do the modeling -- all right?  
17 -- and then define that.

18 But that would be applicable to those 40  
19 plants. The other plants, the balance of the  
20 industry, have used any combination of the single  
21 failure to three or four failures.

22 You heard mention of NEI-001 that has the  
23 methodology, both -- two methodologies: deterministic  
24 and risk-informed. We piloted that at two plants.

25 And so we can't take credit for that

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1 anymore because of this new position with the generic  
2 letter. But I suspect that the solution will be had  
3 with the pilot exercise over the next several months  
4 to a year possibly and that that's the solution that  
5 needs to be evaluated for applicability to the non-805  
6 plants because, absent that, I don't see anyone coming  
7 up with a generic solution for the non-805 plants  
8 today. And it is going to be based upon PRA.

9 MR. MISKIEWICZ: Even in 805, though, when  
10 we do a fire PRA, there will be some iterative  
11 process. You know, we're dependent on the circuit  
12 analysis people giving us the information that we need  
13 to model. And so we're going to try to get risk to  
14 make sure we're modeling the right areas.

15 MEMBER SIEBER: Just the basic methodology  
16 of PRAs causes you to consider multiple spurious --

17 MR. MISKIEWICZ: If you model all of your  
18 singles and multiples from singles --

19 MEMBER SIEBER: That's the way it is.

20 MEMBER APOSTOLAKIS: But in the old days,  
21 in the first PRAs, I don't think we considered that.

22 MR. MISKIEWICZ: You modeled your singles.  
23 And they would combine in your results to give you  
24 multiples.

25 MEMBER SIEBER: Part of the process.

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1 MR. MISKIEWICZ: Yes. But you would still  
2 have to model the spurious event was a failure mode  
3 for that specific piece of equipment, --

4 MEMBER SIEBER: Right.

5 MR. MISKIEWICZ: -- which depends on the  
6 circuit analysis people telling you where that --

7 MEMBER SIEBER: So the philosophical  
8 discussion as to what the assumptions ought to be is  
9 sort of moot because the process of the PRA itself  
10 takes care of that if it's done thoroughly and done  
11 right.

12 MEMBER APOSTOLAKIS: One of the things  
13 that we don't do at this Committee is have  
14 presentations or briefings on the actual analysis that  
15 the industry is doing.

16 MEMBER SIEBER: Right.

17 MEMBER APOSTOLAKIS: I think that would be  
18 extremely beneficial to us if somehow we found a way  
19 to have the industry come and present a detailed PRA,  
20 fire PRA in this case. Anyway, that's a separate  
21 issue.

22 MEMBER DENNING: I think what we would  
23 like to do at this point is thank you gentlemen. And  
24 we may still ask you in the few minutes that we have  
25 left if we have some additional questions. We have

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1 the potential to hear about additional experimental  
2 work that could potentially change some perspectives,  
3 but I don't think we'll do that.

4 I think what we ought to do now is we  
5 would have some discussion while we still have the  
6 staff here and the industry here, we have some  
7 discussion? Would you agree, Graham, that we'll have  
8 some discussion here, see just kind of where we are  
9 sitting on this?

10 CHAIRMAN WALLIS: I was thinking about  
11 that. I think we certainly need discussion.

12 MEMBER SIEBER: Yes.

13 CHAIRMAN WALLIS: I think some of it needs  
14 to be in our working session, --

15 MEMBER DENNING: Yes.

16 CHAIRMAN WALLIS: -- rather than open  
17 session, but I think we can do some of it now. What  
18 little bit we can do now to clarify the situation  
19 certainly we should do now.

20 MEMBER ARMIJO: I have a question that may  
21 not be a discussion. Just in reading the staff's  
22 response to a lot of the comments received on the  
23 draft, there was reference to a lot of -- where is  
24 this thing, the screening tool, a risk screening tool,  
25 that the licensees develop a risk screening tool to be

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1 reviewed and approved by the staff.

2 This is a tool that would evaluate a  
3 variety of different multiple spurious actuations and  
4 sort them out and say, "These are the ones to worry  
5 about. And the rest we don't have to worry about."

6 What is your view? Does such a tool  
7 exist? Do you use such tools, both parties?

8 MR. MISKIEWICZ: We haven't kind of gotten  
9 to that step yet. I'm not exactly sure what the  
10 paragraph is you are referring to.

11 MEMBER ARMIJO: Yes. It's --

12 MR. MISKIEWICZ: But we can do  
13 sensitivities and say, "If I just fail the system, you  
14 know, a functional type of thing, if it's not  
15 significant, then I don't have to go down deeper and  
16 model all the individual spurious. I can screen it by  
17 saying it's not going to matter without doing the  
18 detailed modeling," you know.

19 MEMBER APOSTOLAKIS: The screening depends  
20 on a number of factors, this being one, but the other  
21 is the amount of fuel you have in your area, whether  
22 you can have a fire to begin with, the fire PRA.

23 MEMBER ARMIJO: I thought it was here is  
24 a large number of conductors that can cause spurious  
25 actuations of a large number of systems. And nobody

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1 has defined what scenarios are worrisome. It seems to  
2 me like it's a large number of mind-boggling barriers.  
3 And how do you sort those all?

4 MR. BARRETT: Let me address that.

5 MEMBER ARMIJO: Yes.

6 MR. BARRETT: One of the things that Duke  
7 has done -- and I think Progress is going to follow  
8 suit when they actually do their PRA -- is we have  
9 attempted to put our arms around the most significant  
10 multiples that we could think of by putting together  
11 an expert panel of people who know the plant, know the  
12 Appendix R design, no fire protection, and postulate  
13 these in an organized fashion, like going through  
14 PNIDs and plant design records to say, "All right.  
15 What are the real multiple spurious combinations that  
16 would really hurt me?" and capture those in scenarios  
17 so that they can be analyzed in detail in the fire PRA  
18 so that we can really look at the risk.

19 We're looking at it taking a three-pronged  
20 approach. We have the Appendix R analysis that says,  
21 "Here is all the safe shutdown stuff that I've got to  
22 have. Here are the cables and where they go in the  
23 plant. And then here is what gets damaged in each  
24 fire area."

25 And we take the expert panel. And we say,

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1 "Well, is there anything we missed? You know, is  
2 there something out there that because you end up  
3 flushing the toilet over here and you end up turning  
4 that light bulb on, the combination of things gets you  
5 something you didn't expect?" The expert panel is  
6 supposed to deal with that.

7 And then we also look at the PRA and true  
8 up all AOVs, true up all MOVs, and see if those kinds  
9 of things give us surprises that we didn't expect.  
10 Between the three of those, we think we're going to  
11 end up probably having 95 percent of the  
12 risk-significant scenarios.

13 MEMBER DENNING: For all of your plants,  
14 do you know where your cables are by tray?

15 MR. BARRETT: We didn't. We ended up  
16 having to pay to have that analysis done for us. I  
17 think it was originally determined in the '80s but was  
18 not captured in a database or anything. And we had to  
19 go back and --

20 MEMBER DENNING: But you had that for all  
21 your plants, do you?

22 MR. MISKIEWICZ: I wouldn't say all of the  
23 plants. That's a lot of work. In a lot of cases it's  
24 limited to the set of equipment that met the rule for  
25 the Appendix R compliance --

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1 MEMBER DENNING: It seems to say that --

2 MR. MISKIEWICZ: -- or our equipment that  
3 we want to credit from PRA perspective because there  
4 is risk-significant equipment in mitigation that is  
5 not within the scope of Appendix R right now. And  
6 that we'll add to the list. And some of those still  
7 need to be routed.

8 MEMBER DENNING: You do have additional  
9 cable routing that you would have to determine;  
10 whereas, you feel that you have already done the --

11 MR. BARRETT: There were some things in  
12 the PRA that we had not addressed in safe shutdown,  
13 and we're going to have to have --

14 MEMBER DENNING: Well, PRA is one thing.  
15 What about with this requirement? Does that change?  
16 Would you have to -- if this was imposed on you, do  
17 you think you have to do more cable tracing?

18 MR. BARRETT: What I'm talking about is  
19 our attempt to try to get our arms around all of the  
20 risk-significant scenarios.

21 MEMBER DENNING: Scenarios? Okay.

22 MR. BARRETT: So that's why we did the  
23 expert panel and all of that, to try to get our arms  
24 around things that we would have otherwise missed.

25 MEMBER DENNING: You keep saying

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1 "risk-significant." And we're in a space here where  
2 we're not necessarily risk-significant. It's broader  
3 than that.

4 MR. BARRETT: I think if you take all of  
5 the cables and you just fail them all and you say they  
6 all happen immediately, you're done.

7 MEMBER DENNING: You can't survive.

8 MR. BARRETT: Some of these areas you  
9 can't survive it.

10 MEMBER DENNING: Okay.

11 MEMBER SIEBER: On the other hand, from a  
12 risk standpoint, the set of cables that you have to  
13 know what the routing is becomes larger than the  
14 Appendix R set.

15 MR. BARRETT: Yes.

16 MEMBER SIEBER: But it is certainly not  
17 all of the cables. So there is going to be some  
18 physical work that has to be done if you don't have  
19 pull ticket. If you don't have the database, you  
20 can't --

21 VICE CHAIRMAN SHACK: In the NEI-001  
22 guidance, where, as I understand it, you do up to four  
23 failures, how do you select those four?

24 MR. BARRETT: A similar process with the  
25 expert panel and using Appendix R analysis, a similar

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1 process.

2 MR. FRUMKIN: This is Dan Frumkin from the  
3 staff.

4 One of the things that we have discovered  
5 about defining a failure is a lot of the analyses  
6 assume once spurious actuation, once spurious  
7 actuation, what the NEI or at least the risk, 2,403 --  
8 and I think NEI-001. They talk about multiple hot  
9 shorts.

10 Now, one pair of conductors coming  
11 together could cause numerous different spurious  
12 actuations. So I think that the staff and the --  
13 well, the staff has come out with 2,403 and has put it  
14 on the table.

15 We are looking for this hot short. That  
16 could cause whatever it could cause. We're not  
17 counting spurious actuations anymore. We're taking  
18 that hot short and saying, "Well, what could it  
19 cause?"

20 I think there was a situation where there  
21 was one cable or just a number, just a few conductors,  
22 or maybe it was even two conductors that could give an  
23 indication which could open all of 16 SRVs at one  
24 plant.

25 Now, a long time ago that might have been

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1 16 separate spurious actuations. And today we're  
2 looking at that as one pair of conductors coming  
3 together. And I think everybody is pretty much on the  
4 same page that yes, obviously if the circuits can  
5 cause all of those spurious actuations, we consider  
6 that.

7 MEMBER DENNING: Well, I guess a comment  
8 that I would have on generally what I have heard is  
9 that I think it's very clear that there are timing  
10 issues. If we go forward with the generic letter,  
11 then, at least in my interpretation of the generic  
12 letter, there are timing requirements that are not  
13 doable by the industry and that one would have to do  
14 some relaxation of that. And I don't see where just  
15 having the 30-day, where they can say, "It's going to  
16 take me longer as appropriate."

17 Now, it could be that maybe this should be  
18 more of an information-gathering generic letter,  
19 rather than one that is quite forcing the NRC's  
20 position about the need for multiple spurious  
21 actuations without a more relaxed position like NEI's.

22 I guess what I'm looking for are general  
23 comments as to people, where they are seemingly  
24 falling on this generic letter.

25 MEMBER MAYNARD: Well, I would agree with

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1 most of your comments there. First of all, I do  
2 believe that it clearly constitutes a backfit. We  
3 will get into some other things later on that, but we  
4 don't have to change regulations to be changing  
5 requirements. A change in staff position on what is  
6 acceptable for meeting a regulation, changing those  
7 position, also constitutes a backfit.

8 With that said, I would also like to say  
9 that this issue needs to be resolved. I think playing  
10 around too long about what is the right regulatory  
11 process isn't going to serve everybody's best interest  
12 either.

13 I think it is important. This issue has  
14 been around for 25 years. It needs to get resolved in  
15 an approach going forward as to what is it going to  
16 take to either make it go away as an issue or to  
17 actually fix it.

18 I think the 90 days, I think basically if  
19 it goes out the way it is, basically you're going to  
20 end up with everybody coming in with time request  
21 extensions. And so I don't think that's really the  
22 right thing to do there.

23 If it goes out the way it is, I think it  
24 needs to extend that time. I think it might be better  
25 to go out with what is truly an information request,

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1 to gather information to then be able to determine  
2 what the next steps are.

3 But, again, I don't think process should  
4 drag out for another 5 or 10 or 15, 20 years.  
5 Something needs to be done to put it on a resolution  
6 path.

7 VICE CHAIRMAN SHACK: Let me just come  
8 back to that for a second. I mean, we know what you  
9 expect from the 40 plants that are going for NFPA 805.  
10 What do you expect from the others?

11 MR. WOLFGANG: This is Bob Wolfgang again.

12 I think a number of them are going to come  
13 back and say, "We meet our licensing basis, and thank  
14 you very much. And good-bye."

15 MEMBER DENNING: Will they really say  
16 that? I mean, your --

17 MR. WOLFGANG: That is one thing.

18 VICE CHAIRMAN SHACK: Will you accept that  
19 answer?

20 MEMBER SIEBER: Send it over to  
21 enforcement.

22 MR. WOLFGANG: No. No, we won't. What we  
23 will hear from others is --

24 VICE CHAIRMAN SHACK: What would you  
25 consider an acceptable response from the others?

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1 MR. WOLFGANG: Well, "We don't address  
2 multiple spurious actuations. Here is our plan to  
3 address it to do" X, Y, Z. I don't know. "Do  
4 physical mods."

5 MEMBER DENNING: That's a six months'  
6 answer.

7 MR. WOLFGANG: Yes. That will be the  
8 six-month answer. But initially, yes, either you meet  
9 it or you don't meet it. We don't think we meet it.  
10 We think we meet it.

11 For the first round, that's all I think  
12 we're going to get.

13 MEMBER DENNING: Getting back to this  
14 backfit question, I'm not sure that ACRS is the  
15 appropriate one to answer that. Obviously it makes it  
16 easier for the regulatory staff if it's not a backfit  
17 question.

18 MEMBER BONACA: Yes. One thing that  
19 troubles me a little bit is, you know, is it a  
20 significant issue or is it not a significant issue?  
21 That's a plant-specific answer. And so we're not  
22 going to find out an answer to the question.

23 And I think that if we had to perform a  
24 generic evaluation to justify a backfit, I'm not sure  
25 that it could be done because, I mean, it's so

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1 specific to the plant, the age, to whatever the  
2 situation may be.

3 MEMBER DENNING: But this question of a  
4 specific issue, I think you can do a reduced analysis  
5 to determine. I think you can screen out stuff a  
6 priori --

7 MEMBER BONACA: I think so, too.

8 MEMBER DENNING: -- you know, so that it  
9 isn't such an onerous job to determine what's  
10 important and what's a potentially significant risk  
11 contributor here.

12 MEMBER BONACA: Clearly, I mean, something  
13 has to be done. I mean, we have new evidence in front  
14 of us. And I completely agree with you, Otto, that it  
15 can't wait. They have to be dealt with.

16 I think that, however, the industry needs  
17 more time to deal with this. They don't have a  
18 ready-made process by which they can screen this out  
19 and address it. So the issue is more the time.

20 Now, the next statement again, as reported  
21 to you, is the fact that we are not really the best  
22 charges of what is the most appropriate regulatory  
23 process to follow to go ahead with this.

24 MEMBER APOSTOLAKIS: Our job here is to  
25 judge the generic letter as presented to us.

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1 MEMBER BONACA: Yes.

2 CHAIRMAN WALLIS: I am just wondering how  
3 we add value to this. If we were a subcommittee, we  
4 might well say, "Look, we now know what the issues  
5 are. We think there must be a better way than having  
6 the agency send out this generic letter asking for  
7 things which may be impractical for some plants," but,  
8 then, there should be some way to work with the plants  
9 to figure out what is the right solution to this  
10 technical problem. I'm not sure.

11 We're also sort of a facilitator between  
12 industry and the agency, and that's not really our  
13 job, though, is it?

14 MEMBER SIEBER: Well, the other thing that  
15 is not our job is to try to figure out whether it's a  
16 backfit or not. That's a legal question.

17 CHAIRMAN WALLIS: Well, we don't even know  
18 how important it is because we don't have these proper  
19 risk analyses.

20 MEMBER DENNING: Well, having resolved  
21 these questions, I now turn it back to you, Mr.  
22 Chairman.

23 (Laughter.)

24 CHAIRMAN WALLIS: I can make a very  
25 decision, which is to take a break for lunch. We are

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1 going to be ethics-trained at 12:15. And then we go  
2 to work again at 1:30. Thank you very much for your  
3 presentations.

4 We'll take a break, and as a Committee,  
5 we're going to be back here, not on the transcripts or  
6 anything, for ethics training at 12:15. We'll start  
7 the official proceedings again at 1:30.

8 (Whereupon, a luncheon recess was taken  
9 at 11:33 a.m.)

A-F-T-E-R-N-O-O-N S-E-S-S-I-O-N

(1:33 p.m.)

CHAIRMAN WALLIS: Back into session. The next item on the agenda is another generic letter; first of all, underground cable failures that disable accident mitigation systems.

Our cognizant member is Mario Bonaca. I will hand over the meeting to him. Please go ahead, Mario.

MEMBER BONACA: Thank you, Mr. Chairman.

3) DRAFT FINAL GENERIC LETTER 2006-XX,

"INACCESSIBLE OR UNDERGROUND CABLE FAILURES THAT  
DISABLE ACCIDENT MITIGATION SYSTEMS"

3.1) REMARKS BY THE SUBCOMMITTEE CHAIRMAN

MEMBER BONACA: We have a presentation from the staff. They are proposing to issue a generic letter on inaccessible underground cable failures that disable accident mitigation systems.

We have recently become conversant with this issue through license renewal. You may remember that the GALL report requires for license renewal the existence of two programs: one, a program to detect the presence of water and the watering actions; and the other one is a program to test the cables and essentially-- so we are aware of the concern here.

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1 And the staff is now addressing this issue in the  
2 current licensing area.

3 And so, with that, I will turn to the  
4 staff. Mr. Mayfield?

5 3.2) BRIEFING BY AND DISCUSSIONS WITH  
6 REPRESENTATIVES OF THE NRC STAFF

7 MR. MAYFIELD: Good afternoon. I'm Mike  
8 Mayfield, the Director of the Division of Engineering.  
9 And my division is sponsoring this generic letter.

10 We're here this afternoon to seek ACRS  
11 endorsement to publish the generic letter. The  
12 generic letter, as Mr. Koshy will describe, provides  
13 some information to licensees on the significance of  
14 these potential failures, and seeks some information  
15 from licensees regarding the monitoring of these  
16 cables.

17 Tom Koshy from the Electrical Engineering  
18 Branch will make the presentation.

19 MR. KOSHY: Thank you, Mike.

20 As Dr. Bonaca mentioned to you, this was  
21 first brought to your attention as a problem during  
22 the license renewal hearing at the ACRS. The question  
23 was, is dewatering every ten years going to prevent  
24 the problem?

25 At that time, in light of the failures

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1 that we had noticed at the time, we thought of taking  
2 it as an operating reactor issue under Part 50. And  
3 we did some serious looking into see how big the  
4 problems are.

5 The safety concerns identified at the time  
6 were some of these underground and inaccessible cables  
7 supply power to some safety-related components. Using  
8 some examples here, the off-site power, the cable that  
9 brings the off-site power, to the safety buses.

10 The second would be the emergency diesel  
11 generator feeder. This is critical in those cases  
12 where the emergency diesel generator to building is  
13 physical apart from the main building so that the  
14 underground cables bring into power; and then the  
15 emergency service water pumps, these cases where the  
16 pump house is located again, you know, physically away  
17 from the plant so that the power supply to the service  
18 water pump has to go through underground cables.

19 And failure of one of these cables could  
20 affect multiple systems in these sense there could be  
21 a train, cooling off of safety systems, collectively  
22 influencing more than just one isolated system.

23 Most of these failures that we came across  
24 did not have any direct reference to having a  
25 qualification for this cable to withstand the moisture

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1 environment or, essentially, you know, in duct banks,  
2 if it is immersed in water, you know, can it  
3 withstand. That type of qualification had not been in  
4 existence for these cables that we came across.

5 MEMBER BONACA: Let me understand now,  
6 however. These are cables in safety-related  
7 applications?

8 MR. KOSHY: Yes.

9 MEMBER BONACA: Okay. So evidently on day  
10 one, when the plant was built, there was no  
11 expectation that the cable would be wetted?

12 MR. KOSHY: Yes. In fact, they thought it  
13 would stay relatively dry, but as duct banks develop  
14 cracks, you know, there would be traffic about it.  
15 And eventually these things crack. And depending on  
16 the water table, you know, it could be immersed for a  
17 long time or maybe a short time.

18 MEMBER BONACA: Well, in many cases, these  
19 cables are buried --

20 MR. KOSHY: Yes.

21 MEMBER BONACA: -- in the ground. So from  
22 day one, there was an expectation that they would see  
23 humidity and why we are not environmentally qualified.

24 MR. KOSHY: Either it was not specified at  
25 the time or they thought that, you know, the existing

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1 material at the time could withstand some level of  
2 moisture. For some reason, they did not specifically  
3 seek out.

4 The reason I stated that is, you know,  
5 much in the later period, now we have cables that can  
6 withstand such highly moist environment. In fact, I  
7 know of a case where they have run the cable to the  
8 river. That's for a --

9 CHAIRMAN WALLIS: But not forever.

10 MR. KOSHY: Excuse me?

11 CHAIRMAN WALLIS: Just because they are  
12 qualified doesn't mean they will survive forever in  
13 this environment.

14 MR. KOSHY: You are right, yes. Yes.  
15 They may not survive forever, but at least, you know,  
16 they have some demonstrated capability for a certain  
17 period that it can be even immersed in water and still  
18 do its function.

19 But all of that addresses, you know, the  
20 possibility that you need to know the condition of the  
21 insulation so that you have that confidence that it  
22 can do its function for the foreseeable future.

23 We went back into the history of the LERs  
24 that we have on record. We saw failure at 17 sites  
25 and cable replacements at 100 or so. And most of the

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1 faulty cables were not discovered until there was an  
2 operational failure.

3 Again, these are based on LERs, where the  
4 system has a redundant system or some reason, because  
5 of a plant trip or the failure was serious enough it  
6 prompted an LER.

7 MEMBER ARMIJO: What is your definition of  
8 a medium cable?

9 MR. KOSHY: 5 kV.

10 MEMBER ARMIJO: And above?

11 MR. KOSHY: 5 kV. Well, in the sense of  
12 when you go into 13 kV, you know, some people label it  
13 as medium also.

14 MEMBER ARMIJO: Okay.

15 CHAIRMAN WALLIS: High tension.

16 MEMBER SIEBER: Four-eighty volts to --

17 MR. KOSHY: Four-eighty will be below  
18 that. Yes. We will not call that medium, yes.

19 MEMBER SIEBER: Four-eighty is --

20 MEMBER BONACA: But you include those?

21 MR. KOSHY: Excuse me?

22 MEMBER BONACA: But you include those in  
23 the --

24 MR. KOSHY: Yes, we are including those  
25 because there are certain plants where the emergency

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1 diesel generator generates voltage at 480 and  
2 emergency service water and safety pumps are at 480  
3 volts, some small plants and early vintage.

4 MEMBER BONACA: Okay.

5 MR. KOSHY: So we wanted to include that  
6 also. That's why we went more than just medium  
7 voltage.

8 The EPRI data indicated about 65 cable  
9 failures. And later the white paper which NEI has  
10 submitted indicated about 55 failures for about 15  
11 plants.

12 Most of the cable failures have what in  
13 common? It's about 12 years of age. And the cable  
14 was subjected to some type of, you know, moisture  
15 environment, probably for a longer duration or a  
16 shorter duration. And these things were essentially  
17 common factors.

18 The cables, again, that we are focusing on  
19 is about roughly about six to eight cables, you know,  
20 depending on the design uniqueness, the cables that  
21 can have the most, let's say, significant impact on  
22 the plant.

23 MEMBER MAYNARD: The cable was about 12  
24 years old? You're saying that all of these failures  
25 were about the same age or --

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1 MR. KOSHY: No. More than that. There  
2 are some 20-plus.

3 MEMBER MAYNARD: Okay. All right.

4 MR. KOSHY: Yes.

5 CHAIRMAN WALLIS: It was at least 12 years  
6 old. At least 12 years. I was trying to figure it  
7 out. If it's every 12 years, that's pretty severe.

8 MR. KOSHY: You're right. Twelve and  
9 above. So in this generic letter, what we are  
10 focusing on is power cables that are within the scope  
11 of the maintenance rule, including cables connected to  
12 off-site power, emergency service water, and the other  
13 examples that I stated before, and those routed  
14 through underground or inaccessible locations, such as  
15 buried conduits, cable troughs, above-ground and  
16 underground. And these are the things that we are  
17 considering to be within the scope of this generic  
18 letter.

19 The benefits of this program are gaining  
20 confidence in the capability of the cable to respond  
21 to design bases events. To give you an example, at  
22 Turkey Point after the hurricane, the diesel had to  
23 run for about a week continuously. And thereafter for  
24 a month's period, the diesel had to come back on for  
25 other spurious power outages.

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1           So if you are looking into an accident  
2 where it has to be on a LOOP condition where these  
3 cables may need to be relied on for a few weeks. So  
4 we are not looking at a few hours of operation. The  
5 confidence needs to be gained for a period much higher  
6 than a few hours, which is usually the subject of our  
7 maintenance and surveillance activities.

8           MEMBER BONACA: Do you have examples of  
9 failures in service that were not exhibited during  
10 functional testing?

11           MR. KOSHY: What we have, the reported  
12 failures are a combination of both. Some in-service  
13 failures certain plants appear to have more than  
14 others. And others, when you start for surveillance,  
15 you find out that, you know, after a couple of hours,  
16 it fails.

17           So the LERs that we recorded are those  
18 cases where the plant impact was significant, so in  
19 the sense either operational. And if it is purely  
20 during a surveillance, we will not get an LER report  
21 on it.

22           So that's some of the problem that we are  
23 facing. The LERs that we received are so limited in  
24 number because, you know, it had to either bring a  
25 plant down or give an easy access situation for us to

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1 plant an LER report.

2 So that's why we are focusing on getting  
3 a handle on the extent of failures so we can engage  
4 them and see what other actions would be necessary.

5 CHAIRMAN WALLIS: Could you explain  
6 something to me?

7 MR. KOSHY: Yes.

8 CHAIRMAN WALLIS: I can understand  
9 off-site power sort of coming in on the underground  
10 cable. Why is diesel generator? Why does the diesel  
11 generator have underground cables? Is it part of the  
12 plant?

13 MR. KOSHY: Yes. For example, in some  
14 plants, the building is a separate building.

15 CHAIRMAN WALLIS: It's in a separate  
16 building. It's in a separate building.

17 MR. KOSHY: Yes. For example --

18 CHAIRMAN WALLIS: Okay.

19 MR. KOSHY: -- they have separate  
20 building.

21 CHAIRMAN WALLIS: They might be in a  
22 separate building?

23 MR. KOSHY: Yes.

24 CHAIRMAN WALLIS: That's very different  
25 from, say, something that comes from off-site power,

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1 where the cable may be a long cable from --

2 MR. KOSHY: Yes. That will be  
3 significantly longer. That will be from the  
4 switchyard. In some cases, you will have a situation  
5 closer to the plant, where you bring down to 13 kVR or  
6 so.

7 CHAIRMAN WALLIS: Okay. Thank you.

8 MR. KOSHY: The next benefit is we can  
9 prevent the unanticipated failures that cause plant  
10 transients by using the maintenance rule as the scope.  
11 We are also looking at challenges to the plant in the  
12 sense of what will give you a plant transient. So  
13 that is what is seen as the scope of this generic  
14 letter.

15 The next is you can use a convenient  
16 outage if you know the rate of degradation. Rather  
17 than taking, you know, unwarranted outages, you can  
18 schedule that cable replacement for a convenient  
19 refueling outage and do the replacement with minimum  
20 interruption.

21 CHAIRMAN WALLIS: Are these cables usually  
22 designed so they can easily be pulled through to  
23 repair them?

24 MR. KOSHY: No. It is very  
25 time-consuming, most of the --

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1 CHAIRMAN WALLIS: There's not a big duct  
2 in the cable and you just drag through a new cable?

3 MR. KOSHY: No.

4 CHAIRMAN WALLIS: No? You have to take it  
5 out? You have to dig it up?

6 MEMBER SIEBER: It's the whole thing. No.

7 MR. KOSHY: Well, pull-through is there,  
8 but the thing is it has a lot of staging. And you  
9 have energized equipment on both sides. So you need  
10 to essentially take some bus outages. So it is  
11 significantly time-consuming.

12 CHAIRMAN WALLIS: Yes, but you don't have  
13 to dig it out?

14 MR. KOSHY: Unless it is direct buried  
15 cable.

16 MEMBER BONACA: In fact, I mean, for  
17 example, yesterday during the review of Monticello,  
18 the majority of their underground cable, they're  
19 buried.

20 CHAIRMAN WALLIS: Those are usually  
21 utility duct or something, in other words.

22 VICE CHAIRMAN SHACK: This is direct  
23 buried.

24 CHAIRMAN WALLIS: Direct buried cable?

25 MR. KOSHY: Those are not exceptions.

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1 Usually you will have a duct bank with some sleeves in  
2 there so that you can pull through it.

3 MEMBER BONACA: And it depends on the age  
4 of the plant. I mean, Monticello is an older plant.  
5 They buried it, and that was it.

6 MR. KOSHY: So you have a wide variety on  
7 those?

8 MR. MORRIS: Tom, George Morris, EEEB.  
9 Some of the original cables that were pulled through  
10 duct bank, all of the original cables that were pulled  
11 through duct bank, were pulled through with the use of  
12 cable lubricant to reduce the friction. After they  
13 had been in there for a while, that lubricant has  
14 dried up.

15 MEMBER BONACA: It doesn't work.

16 MR. MORRIS: In some cases, it's almost  
17 like concrete.

18 MR. KOSHY: Okay. Moving on to some  
19 examples, Ocone is a success story where they found  
20 that two of the six cables had significant  
21 degradation. And they were able to monitor it and  
22 take the outage at a convenient time so that they can  
23 replace them.

24 Another example I am using here is Peach  
25 Bottom. When they experienced a failure, they decided

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1 to make a global replacement. You know, they didn't  
2 want to do any testing at all. And that's also a  
3 solution.

4 CHAIRMAN WALLIS: Now, is it always water  
5 that leads to degraded cables? It seems to me that  
6 you could have a cable and a duct which might just --  
7 you know, the insulation can over a period of time  
8 oxide or whatever it does. I mean, even in your house  
9 without water, you get cables that --

10 MR. KOSHY: Yes.

11 CHAIRMAN WALLIS: The insulation cracks  
12 and so on.

13 MR. KOSHY: This has some influence in the  
14 sense if it is a dry insulation and there is only  
15 cracks, chances are it will survive a little longer.

16 CHAIRMAN WALLIS: That's right, but it may  
17 --

18 MR. KOSHY: The presence of chemicals --

19 CHAIRMAN WALLIS: Makes it work.

20 MR. KOSHY: -- create default.

21 CHAIRMAN WALLIS: It's not essential that  
22 you have moisture, is it?

23 MR. KOSHY: Right. You're right. We are  
24 not trying to look at the root cause of what causes  
25 the failure. We are more interested in seeing,

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1       irrespective of the causes, let's have a program in  
2       place so that we can prevent such unanticipated  
3       failures and have a great confidence in the accident  
4       mitigation capability. So that's the focus we are  
5       trying to get because for --

6                   CHAIRMAN WALLIS: There is no routine  
7       measurement of, say, resistance of ground of a cable?  
8       There is no routine --

9                   MR. KOSHY: There is some technology  
10      developing that way, but online systems have not been  
11      doing that well. I think the industry is headed that  
12      way and there is some aggressive effort in the  
13      industry for coming up with something like that or,  
14      rather, building confidence in the systems that are  
15      now under development.

16                   Oyster Creek is an example where they  
17      replaced the cables and they had few repeated  
18      failures. This design is also unique. They  
19      essentially had this cable going about 200 feet away  
20      from the main plant as an extension of the safety bus.  
21      And this is remaining energized all the time. And  
22      that earlier had several failures.

23                   So the information that we are requesting  
24      is provide to us a history of the cable failures in  
25      the scope that I discussed just before and a

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1 description and frequency of the inspection, testing,  
2 and the monitoring programs in place. And if you do  
3 not have a monitoring program in place, explain to us  
4 why such a program is not necessary. So that is  
5 essentially what we are asking in --

6 CHAIRMAN WALLIS: So this is really  
7 information gathering. This isn't requiring an  
8 action?

9 MR. KOSHY: Right, right.

10 VICE CHAIRMAN SHACK: Now, are you  
11 distinguishing between a monitoring program and a  
12 functional testing program here?

13 MR. KOSHY: Okay. The explanation that we  
14 have given, in fact, I am addressing as a response to  
15 a public comment, what we are saying is the functional  
16 testing that you do that you energize for a short  
17 period doesn't give you any confidence that it will do  
18 it again.

19 VICE CHAIRMAN SHACK: Okay. So you're not  
20 counting that as a monitoring program?

21 MR. KOSHY: Yes. We are not.

22 MEMBER SIEBER: A surveillance test.

23 MR. KOSHY: These are the organizations  
24 that have given response to the first version that  
25 went out for public comments. And I will address the

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1 highlights of how we addressed those comments.

2 Cable failures are random. And,  
3 therefore, no NRC action is required.

4 CHAIRMAN WALLIS: It sounds like saying  
5 they're an act of God or something.

6 MR. KOSHY: Yes. We just explained the  
7 surveillance activity, which wouldn't give you  
8 confidence on its future performance. You need to in  
9 some way monitor the condition of that insulation so  
10 that we can build that confidence.

11 Again, you know, this is the small group  
12 of cable where you have this problem. Otherwise, the  
13 rest of the cable is in a dry environment. Next to  
14 selectable sealed-in concrete, you know, these cables  
15 should be the most reliable piece of equipment in a  
16 plant, you know, should not be failing for about 40  
17 years or, in fact, for 60 years, you know, if it is  
18 the environment and the conditions are right.

19 And I quickly explained before that the  
20 low-voltage cables are included because some of the  
21 early vintage plants have this 480-volt equipment for  
22 safety buses, diesel, and naturalized emergency  
23 service water, and service water equipment.

24 CHAIRMAN WALLIS: The original sentence is  
25 garbled. It doesn't matter. Essentially we have a

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1 period after impact, and that's all right. Scope is  
2 limited.

3 MR. KOSHY: Okay. Again, we just  
4 addressed this issue, why this basic surveillance  
5 tests of operating for a half an hour or two hours  
6 wouldn't be sufficient to gain that confidence for --

7 CHAIRMAN WALLIS: What you do is you put  
8 on them the voltage that they would have in operations  
9 and --

10 MR. KOSHY: No. You actually energize a  
11 --

12 CHAIRMAN WALLIS: Do you actually have to  
13 have current going? Do you have to current going  
14 through these cables to test them or does it have the  
15 voltage applied to them and see if there's a leakage?

16 MR. KOSHY: Yes. There are about eight or  
17 ten techniques in the industry.

18 CHAIRMAN WALLIS: There's a whole lot of  
19 techniques.

20 MR. KOSHY: Yes, yes. And the thing is  
21 the early technique was just apply very high voltage  
22 and make it fail. That was the most crude way of  
23 doing it.

24 MEMBER SIEBER: Meggering.

25 MR. KOSHY: Meggering is another method,

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1 but that has certain weaknesses, too.

2 MEMBER SIEBER: You have reflective  
3 techniques.

4 MR. KOSHY: Yes. Time domain reflects  
5 III, and about six or eight techniques are there. And  
6 there are still some under development. Collectively  
7 you have about two IEEE standards that go into details  
8 of the type of tests available and the level of  
9 confidence that you have based on the type of cable.

10 So depending on if you have a shield and  
11 what kind of shield and what type of rubber material  
12 is used, the level of confidence is different, you  
13 know, depending on the type of test that you do.

14 So there is some industry that two IEEE  
15 standards are available to address that and which one  
16 is better and which one is desired.

17 MEMBER SIEBER: You can get some pretty  
18 high voltages in these cables from switching  
19 transients.

20 MR. KOSHY: That's true.

21 MEMBER SIEBER: It will go well beyond the  
22 rating for a very brief period of time. And sometimes  
23 that's when the insulation fails.

24 MR. KOSHY: Yes.

25 MEMBER BONACA: By "surveillance test,"

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1 you mean surveillance of the equipment and this power  
2 by the cable?

3 MR. KOSHY: Right. You are giving normal  
4 voltage and normal function of a couple of hours, you  
5 know, like in the pump in service inspection or type  
6 of surveillance you will expect to run in for two or  
7 three hours, make sure it is for using the rate of  
8 flow and things like that. That's the type of test  
9 that will not give you a feeling of how good the  
10 insulation is. Will it last for the next two weeks of  
11 runoff?

12 The regulatory basis for our cable  
13 monitoring is we have added that what is seen in bold,  
14 that condition is something that we really did not  
15 have in the first version. And we are essentially  
16 saying that "assess the continuity of the systems and  
17 the condition of the components." So you need to know  
18 the condition of this insulation so that we can have  
19 that confidence on its performance.

20 MEMBER ARMIJO: Could you expand that?  
21 Condition based on electrical properties? Are you  
22 actually looking for physical condition? They're in  
23 accessible.

24 MR. KOSHY: These are inaccessible, but  
25 you do have state-of-the-art techniques available in

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1 electrical testing which will measure the testing of  
2 the insulation.

3 MEMBER ARMIJO: Okay.

4 MR. KOSHY: So if you can establish that  
5 the integrity of the insulation is reasonable, then  
6 you have that confidence that it will not fail in the  
7 most probable cases.

8 MEMBER ARMIJO: Thank you.

9 MR. KOSHY: The question was regarding  
10 multiple cable failures. The only example that we  
11 have collected in light of our efforts is a case where  
12 one insulation failure was in the circulating water  
13 pump, resulted in taking two other substations out  
14 with it.

15 The possibility that we are talking of is  
16 the fault itself causes a transient and sends some  
17 transient current. And if you have some near-failure  
18 equipment, that can be a cause for additional  
19 failures. You know, these are speculative problems.  
20 And this is the only example that we have on record  
21 for that.

22 Now, the modifications that we have done  
23 in light of the comments on this are editorial in  
24 nature, a good part. We revised the scope to include  
25 the above-ground and below-ground duct banks; removed

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1 the broadband spectroscopy because that's not a proven  
2 technique yet, but, again, that could be a technique  
3 available in the future; revised the requested  
4 information to include the type of service so that we  
5 will be able to know if there are repeated failures in  
6 a certain area. And we revised the data collection  
7 time to 60 hours.

8 CHAIRMAN WALLIS: So it would seem that  
9 there is still a gap between your view and the  
10 industry's view.

11 MR. KOSHY: Yes.

12 CHAIRMAN WALLIS: The industry had some  
13 pretty strong comments. And your modifications don't  
14 reflect large changes in response to their comments.

15 MEMBER SIEBER: Right.

16 CHAIRMAN WALLIS: So there would seem to  
17 be still a big gap between your view and the  
18 industry's view. Is that true?

19 MR. KOSHY: I will address that in the  
20 next slides along with the NEI white paper issues, in  
21 slides 16 and 17.

22 CHAIRMAN WALLIS: Okay.

23 MR. KOSHY: We presented this to CRGR.  
24 And CRGR asked us to do two improvements on the  
25 generic letter: to bring the focus on the power

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1 cables itself and also to add a safety-related example  
2 to show the significance of this failure on a plant.  
3 In the package that you have received, we have  
4 incorporated those changes.

5 We received the NEI white paper much after  
6 the comment period on May 1st. I have addressed the  
7 highlights in this coming couple of slides. One is a  
8 graded approach. Again, the number that you see on  
9 the top is the sections that correspond to the NEI  
10 white paper, 6.6.

11 The graded approach for monitoring and  
12 replacement of cables, the bullets are many cables do  
13 not power safety-related equipment; and the other one,  
14 graded approach to replacement and monitoring is best  
15 for safety and business reasons.

16 Our response is that we are only focusing  
17 on those that are significant. That's the very reason  
18 that we are using to bring the scope down to the  
19 maintenance rule. And we mentioned certain systems in  
20 there because to, let's say, overcome the variances  
21 and interpretations on that rule and also because  
22 those examples that we state there are the ones that  
23 have most impact on the plant in the sense affecting  
24 multiple systems.

25 Therefore, these are classified as most

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1 important because of these reasons. And, therefore,  
2 you know, it will be important to prevent the  
3 transients and also in supporting of mitigating the  
4 accident.

5 So that's how we have narrowed the scope  
6 and as to bringing down to only important cables and  
7 not all of the cables at large. And the numbers that  
8 you see in that white paper are some plants have like  
9 300-plus cables. And that won't be within the scope  
10 of maintenance rule.

11 The next one, the recommendations again in  
12 chapter 8, is provide dry environment, prepare for  
13 cable failures, and share failure resolutions.

14 Providing a dry environment -- again, you  
15 know, these are all installed cables. It's not quite  
16 practical. And pumping out would help. It will slow  
17 down the failure, but it cannot prevent the failure.  
18 It may take a little longer. And these cable failures  
19 could affect many systems. And the replacement of  
20 these cables is very time-consuming.

21 So if you have a valid accident mitigation  
22 method and at that time trying to make this cable  
23 replacement could be very difficult because the cables  
24 that run in the same duct banks could be helping the  
25 accident mitigation at that time. And your cable

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1 pulling and taking bus outages would not be desirable  
2 actions when you run into an accident environment or  
3 facing a LOOP or a station blackout.

4 And the technique is available there to  
5 have that reasonable confidence so that we can rely on  
6 these cables for continued operation.

7 That's all we have prepared for presenting  
8 to you. And if you have --

9 MEMBER BONACA: I have a question --

10 MR. KOSHY: Sure.

11 MEMBER BONACA: -- regarding in the  
12 generic letter, you talk about 23 LERs --

13 MR. KOSHY: Right.

14 MEMBER BONACA: -- and two monitor  
15 reports. Then the letter says that you believe that  
16 this is a very small fraction. That is the word used  
17 in the LER in the generic letter, a very small  
18 fraction of the actual failure to take place, which  
19 tells me that the number of failures that happen may  
20 be in the hundreds.

21 What is the projection? What does it mean  
22 that 25 in total is a very small fraction?

23 MR. KOSHY: It's very difficult to make  
24 such an estimate, but let me give a personal  
25 experience that I know of. I was at an AIT for a

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1 plant where they had such a cable failure. At that  
2 time they had six cable failures already when we had  
3 the AIT in the mid '80s. So that is repeated failures  
4 happening at one plant.

5 MEMBER BONACA: Okay.

6 MR. KOSHY: Again, I know of another  
7 Northeastern plant where they have all of these  
8 service water cable and emergency service water cables  
9 going through manholes. And they had splices in that  
10 also. And this manhole gets filled with water. And  
11 when the manhole cover knocks out, that's when you  
12 find out the splice failed. They had also quite  
13 repeated failures.

14 So certain plants may have a higher  
15 susceptibility because of groundwater and the design  
16 uniqueness. There may be some plants in absolutely  
17 dry environment, like WNP 2 in the middle of the  
18 desert. They may not have any cable problems because  
19 it's always dry. and if it all drains, it dries out  
20 so fast. So some plants may be fully exempt from this  
21 problem.

22 If the water table is a guide, those are  
23 the ones where you have high susceptibility and  
24 failures. And some plants are kind of glaringly  
25 different than others.

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1 MEMBER BONACA: The information you are  
2 requesting is regarding all cables, right, not only  
3 those in a weather condition?

4 MR. KOSHY: All cables and inaccessible.

5 MEMBER BONACA: Inaccessible.

6 MR. KOSHY: Yes.

7 MEMBER BONACA: Exactly. Okay.

8 MR. KOSHY: So plants where they did not  
9 have failures would not have anything to report. But  
10 if you had failures, we would like to know them --

11 MEMBER BONACA: Yes.

12 MR. KOSHY: -- so that we can kind of  
13 gauge, you know, are there repeated problems, what are  
14 the vulnerabilities, and based on that probably share  
15 the lessons and see if you have to take further  
16 action. Maybe it's down to a few plants. We do not  
17 know that because we lack the data to support that.

18 And the NEI white paper data shows about  
19 15 plants having about 45 to 50 failures. That could  
20 be an indication because they focused on underground  
21 and medium voltage only.

22 MEMBER BONACA: But your monitoring  
23 program that you're talking about doesn't deal only  
24 with cables that failed. It deals with cable aging  
25 that may be operable during functional testing that

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1 failed during demand, service.

2 So how are you going to gather information  
3 regarding these kind of cables?

4 MR. KOSHY: Okay. What we are saying is  
5 if those cables are within the scope of maintenance --

6 MEMBER BONACA: Yes.

7 MR. KOSHY: -- and they're underground and  
8 inaccessible, tell us if you have failures. And do  
9 you have a program when they have this susceptibility  
10 for failure to make sure that it wouldn't fail?

11 MEMBER BONACA: I understand.

12 MR. KOSHY: So you're not on the scope.  
13 Tell us what the failure is. And see how you monitor.

14 MEMBER BONACA: Right.

15 MEMBER ARMIJO: I have a question. How  
16 can you have a failure of above-ground inaccessible  
17 cable without water? Is it --

18 MR. KOSHY: Okay. What happens is, you  
19 know, even in some large conduit connections which go  
20 on the surface because of the variance, you get  
21 condensation built in there unless you have a way of  
22 venting it out.

23 MEMBER ARMIJO: Well, it could be a  
24 significant amount of water.

25 MR. KOSHY: You could collect all the

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1 time.

2 CHAIRMAN WALLIS: You get a humid day and  
3 a cold night.

4 MR. KOSHY: For the condensation and --

5 MEMBER SIEBER: You can get cable failures  
6 from things other than water.

7 MR. KOSHY: Yes, other chemicals and other  
8 leeching, yes.

9 MEMBER SIEBER: Chemicals, overheating.  
10 You know, that degrades insulation or defect in  
11 splices, for example, if --

12 MR. KOSHY: Yes. Splices is another  
13 vulnerable point.

14 MEMBER SIEBER: It's handmade.

15 MEMBER MAYNARD: A couple of questions.  
16 On the provided inscription of the frequency of all  
17 inspection testing, monitoring, are you talking about  
18 what is currently in place or are you asking the  
19 licensee to go back to day one for all of what testing  
20 has been done?

21 MR. KOSHY: We are asking for what you  
22 have in place now so that you can put in place such  
23 unanticipated failures.

24 MEMBER MAYNARD: Okay. And the other  
25 thing is, is the staff coordinating in any way? This

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1 is requesting this information to be within 90 days.

2 MR. KOSHY: Right.

3 MEMBER MAYNARD: And it would appear to me  
4 that if the other generic letter on the spurious  
5 actuation gets issued, a lot of the same resources  
6 could be required or needed for a lot of these  
7 activities, both dealing with electrical circuits,  
8 just --

9 MEMBER SIEBER: This one is pretty --

10 MR. KOSHY: We will work with the Generic  
11 Communications Division so that we would be sensitive  
12 to that.

13 CHAIRMAN WALLIS: So what are you going  
14 with the information when you get it?

15 MR. KOSHY: What we are hoping is that  
16 depending on, let's say, the breadth and depth of the  
17 problem as to why widespread, we may have to think of  
18 NRC action if that warrants it. We have --

19 CHAIRMAN WALLIS: You think that there  
20 might be some problem. You have this sort of you  
21 almost call it a fishing expedition, where you get all  
22 of this information. And then you look at it and say,  
23 "Aha. Now we have to do something or not." You're  
24 not quite sure what you are going to find.

25 MR. KOSHY: Okay. We know it is a

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1 significant problem in the light of what I explained  
2 to you.

3 CHAIRMAN WALLIS: There have been events,  
4 right.

5 MR. KOSHY: Yes. We have been having  
6 events, which either the plant is out or disabled  
7 safety systems. And those things kind of give you a  
8 flavor of significance.

9 CHAIRMAN WALLIS: But the result of all of  
10 this information gathering might be that you decide  
11 everything is okay as it is now.

12 MR. KOSHY: If the industry has, let's  
13 say, commitments to prevent such failures, yes. But  
14 if you are seeing failures and repeated failures, we  
15 have to rethink what we should be doing. Okay? We  
16 are not there yet. We need to --

17 MR. MAYFIELD: Professor Wallis, this is  
18 Mike Mayfield from the staff. As we assess the  
19 results we get back from this, we would have to make  
20 a decision whether generic action is warranted or is  
21 there some plant-specific action that is warranted or  
22 things are being managed appropriately as it is. And  
23 we just don't know until we get the results back. We  
24 have enough indicators to make us believe that we need  
25 to go --

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1 CHAIRMAN WALLIS: I think the industry  
2 response to the public comments was everything is  
3 fine, we're doing the right thing now. You just want  
4 the assurance that it really is so.

5 MR. MAYFIELD: That might be the outcome.  
6 And we'll have to see what actually comes in.

7 MEMBER SIEBER: The third question sort of  
8 tips your hand as to what you want. And it says if a  
9 monitoring or surveillance program is not in place,  
10 explain why such a program is not necessary.

11 In other words, here's a plant with  
12 failures. And they're not testing anything.

13 MR. MAYFIELD: We might want to chat with  
14 them a bit.

15 MEMBER SIEBER: You gave them the hint.  
16 You ought to test something.

17 MEMBER BONACA: Or you may have a plant  
18 where there have been no failures and you have no  
19 significant power equipment. Then why should you even  
20 have a test? I mean, then you have a threshold for  
21 saying, "We don't need it."

22 MEMBER MAYNARD: I've got a feeling when  
23 you get all of this, the actual number of failures if  
24 you divide it by the number of plants and the number  
25 of operating years wouldn't look that great, but when

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1 you go to group them, there may be some areas where  
2 you --

3 MR. MAYFIELD: Exactly. And that is not  
4 an uncommon outcome from getting this kind of  
5 information.

6 MR. KOSHY: One thing you find out is the  
7 data that we have at this time is based on normal run  
8 and surveillances, not an extended use of like two,  
9 three weeks. So what we are trying to see is gain  
10 confidence that these cables can continue in service  
11 for two or three weeks if there is a station blackout  
12 or some reason and we can continue to rely on these  
13 cables for that safety function.

14 MEMBER BONACA: Yes. That is a very  
15 important issue, you know, the failure to run. So the  
16 equipment starts, but then it won't run for as long as  
17 it has to. And that's trickier because, I mean, the  
18 number of failures experienced to date doesn't give  
19 you a specific insight on these cables. And that's  
20 their function.

21 MR. KOSHY: Right.

22 MEMBER BONACA: Any additional questions?

23 (No response.)

24 MEMBER BONACA: If not, I thank you for  
25 the presentation.

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1 MR. KOSHY: Thank you.

2 MEMBER BONACA: I think Mr. Marrion of NEI

3 --

4 MR. MARRION: Yes.

5 MEMBER BONACA: -- would like to make a  
6 statement. NEI, of course, produced that white paper  
7 that is quite interesting on this issue.

8 MR. MARRION: Good afternoon. I'm Alex  
9 Marrion, the Senior Director of Engineering at NEI.

10 I do have a couple of comments I want to  
11 make about basically what we heard. We haven't seen  
12 the staff disposition of the public comments that have  
13 been submitted. Nor have we seen the current version  
14 of the proposed generic letter.

15 But I have to tell you I am confused. And  
16 the reason for that confusion is that a couple of  
17 years ago, I received a letter from the Electric  
18 Systems Branch Chief articulating concern with a  
19 potential common mode of medium voltage cables. And  
20 the common mode failure mechanism was water training.  
21 This was based upon a review of 20-some odd licensee  
22 event reports.

23 We had a public meeting with the staff to  
24 understand, get a little more of an understanding of,  
25 their concerns. And we looked into the licensee event

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1 reports, and they had -- I'm trying to remember. I  
2 think there was only one or two that had a potential  
3 for being related to the water-training phenomenon  
4 that the staff was concerned with.

5 But it became clear to us that we needed  
6 to develop a document that would be an educational  
7 piece, if you will, primarily focusing for the  
8 industry, but we also felt that the NRC could possibly  
9 benefit from it. And that was the basic objective for  
10 the white paper that we developed.

11 The purpose for the educational piece was  
12 to articulate a clear understanding of the  
13 water-training phenomenon to articulate our assessment  
14 of the licensee event reports that the staff was using  
15 as a basis --

16 CHAIRMAN WALLIS: You're talking about a  
17 water-training phenomenon?

18 MR. MARRION: Water training, yes.

19 CHAIRMAN WALLIS: Training. Oh, I'm  
20 sorry.

21 MR. MARRION: Yes, water training. I'm  
22 sorry. I've got a cold, and I'm a little congested.  
23 I apologize.

24 CHAIRMAN WALLIS: That's my  
25 misunderstanding. I'm sorry.

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1 MR. MARRION: -- and also provide us a  
2 technically based understanding of the application of  
3 that phenomenon to basic cable configurations and  
4 insulation systems that exist in the power plants  
5 today or not in the power plants but exist in these  
6 applications today.

7 We concluded that you can't make a general  
8 statement that water training is of concern because  
9 it's not applicable to every cable configuration and  
10 insulation system that's in the field today.

11 It appears that the staff is attempting to  
12 require a cable-monitoring program. I'm not familiar  
13 with the details of the maintenance rule, but I know  
14 that the equipment to which these cables are  
15 terminated are monitored in the maintenance rule.

16 And since the cables aren't active  
17 components, I'm not sure whether they should be  
18 included in the maintenance rule or not. But  
19 fundamentally if the staff expectations and basis in  
20 this generic letter are not clear, you have the  
21 potential of a generic letter basically undermining a  
22 regulation.

23 I don't know if the staff has done a  
24 review with the maintenance rule folks within NRR, but  
25 I would recommend that be done before this is

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1 submitted.

2 CHAIRMAN WALLIS: You're implying this,  
3 but, in fact, they just say they're gathering  
4 information. And it's not clear that they intend to  
5 do anything which would change the regulation in any  
6 way or interfere with regulation. You don't know what  
7 they're going to do.

8 MR. MARRION: And the licensee has to  
9 document a justification of why they don't have a  
10 cable-monitoring program. That is --

11 CHAIRMAN WALLIS: But you're implying that  
12 something downstream is going to require this. That's  
13 not actually a --

14 MR. MARRION: No. I'm implying there may  
15 be a conflict between what the generic letter is  
16 asking for and what is required by the --

17 CHAIRMAN WALLIS: You're asking for  
18 information, rather.

19 MR. MARRION: Well, okay. That's one way  
20 of looking at it. It is a request for information or  
21 an attempt to require a cable-monitoring program. And  
22 I'll let you folks decide how you want to do that if  
23 they want to interpret that.

24 I think that, you know, the staff has made  
25 some comments about, you know, what their concern is.

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1 And it's not clear to me. I have to tell you I'm  
2 confused. Maybe it's because of our involvement over  
3 the past several years, but I have yet to see any kind  
4 of risk analysis or any kind of statistical analysis  
5 conducted by the NRC to articulate some level of  
6 confidence that they find unsatisfactory relative to  
7 the performance of the cable or the equipment.

8 We have attempted to do some statistical  
9 work in our white paper based upon the survey that we  
10 had conducted. I'm not happy with the fact that we  
11 didn't get 100 percent of the utilities to respond,  
12 but we got on the order of 80 percent, I think, 79.  
13 something. That has some benefit.

14 My concern at this particular point is  
15 when the generic letter is finally issued, based upon  
16 what I heard this afternoon, we're going to have to  
17 request a meeting, a public meeting, and probably  
18 document further clarification of what the NRC is  
19 really interested in this information request as they  
20 go forward because it's not clear at this particular  
21 point in time. And that's all I have to say. I would  
22 be more than happy to answer any questions you may  
23 have.

24 (No response.)

25 MR. MARRION: Okay. Thank you.

1 CHAIRMAN WALLIS: You're welcome.

2 You were suspicious that if they gather  
3 this information, then they might use it to require  
4 something which they wouldn't be able to do if they  
5 didn't have the information?

6 MR. MARRION: No. It's not clear what  
7 concern is trying to be addressed by the request for  
8 information.

9 CHAIRMAN WALLIS: Well, the concern is  
10 that these cables will fail. It's a simple concern.

11 MR. MARRION: Well, where does that  
12 concern stop? Do you stop at these cables or do you  
13 continue that concern at the equipment, et cetera,  
14 that is under continuous surveillance programs and  
15 testing? I mean, where does it end?

16 And it's a concern about having possible  
17 unanticipated failures? Well, where do you stop  
18 asking that question now that you started on medium  
19 voltage cables and the small population of medium  
20 voltage cables, I suspect?

21 So there are some real issues that have to  
22 be addressed here because the utilities are going to  
23 want to be responsive to the generic letter. My job  
24 is to make sure that we understand it adequately so  
25 the utilities will be responsive, but right now I'm

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1 not sure we have that understanding.

2 MEMBER BONACA: Well, if I understand it,  
3 I mean, the issue has to do with two things. One is  
4 inaccessible equipment that cannot be visually or  
5 other means inspected -- so it's a very narrow family  
6 -- and then equipment that is really in accepted  
7 applications.

8 And clearly equipment is seeing a water  
9 condition or wetness that -- so it's a pretty unique  
10 and narrow population, but I think at least I am  
11 interested to know what kind of equipment is being  
12 powered by this kind of cable out there. And if it is  
13 something critical, a generic letter or whatever,  
14 connection to off-site power, you know, it's a unique  
15 concern.

16 I mean, we addressed it and discussed it  
17 during license renewal because it was significant.  
18 And the industry and the NRC worked together on a goal  
19 inspection program for those cables.

20 And where does the aging start? I mean,  
21 does it start with a theatre of operation or does it  
22 start before? Clearly there is degradation taking  
23 place at some point. I realize I don't know all there  
24 is necessary to know about that.

25 MR. MARRION: If I may just offer a couple

1 of comments?

2 MEMBER BONACA: Yes?

3 MR. MARRION: The aging phenomenon begins  
4 from the time that the cable is shipped from the  
5 manufacturer's facility.

6 MEMBER BONACA: That's right.

7 MR. MARRION: And it's exacerbated by  
8 environmental conditions as well as operational  
9 conditions that wind up stressing the cable insulation  
10 system. And a submerged, wetted environment for  
11 certain insulation systems has the potential of  
12 increasing the aging or the rate of aging degradation,  
13 et cetera. That is well-known.

14 The equipment that's affected here  
15 includes diesel generators at some plants at 4,000 or  
16 4,160 volts as well as other plants at 6.9 kV. I  
17 don't know about -- I think one of the staff was --  
18 Tom made a comment about some diesel generators  
19 operating in the 480 volts. If that's indeed the  
20 case, then that's indeed the case.

21 But mean voltage cable in the industry is  
22 characterized as 2,000 to 15,000 volts. So I'm hoping  
23 that the generic letter will be very clear of  
24 articulating the 480-volt applications. And is it  
25 only for that particular piece of equipment or is it

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1 for something else? That's one of the points of  
2 clarity that's needed.

3 We tried to capture in our white paper --  
4 and I hope you've read it; we've made it available to  
5 you -- the current state of understanding of cable  
6 insulation systems at this voltage level and  
7 underground applications and which insulation systems  
8 are susceptible to water damage over time.

9 We have encouraged the utilities to  
10 prepare for such failures because if you look at the  
11 age of the fleet, we are approaching the end of  
12 service life of a lot of these cables. It's typically  
13 30, 35, 40 years based upon normal environmental  
14 conditions.

15 And our recommendation to the industry was  
16 don't wait for a failure before you have to deal with  
17 this problem because this is not the kind of cable  
18 that you typically keep large quantities in inventory  
19 at the warehouse, et cetera. And if you're not  
20 prepared, you will have an extended outage should you  
21 have such a failure.

22 I don't know if the generic letter is  
23 going to speak to that, but I also know that there is  
24 not a cable-monitoring system that is applicable and  
25 effective and available to the utilities today.

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1           There are some testing techniques that are  
2 effective for certain kinds of insulation  
3 configurations. And our white paper speaks to that.  
4 But based upon the information I have gotten from  
5 EPRI, who is pursuing research in this area, et  
6 cetera, that there isn't one technique that would be  
7 useful. So okay?

8           MEMBER BONACA: Thank you.

9           MR. MARRION: Thank you.

10          MEMBER BONACA: Yes. I think we're  
11 scheduled for some closing remarks. Is there?

12          MR. MAYFIELD: Just very briefly. We  
13 believe we have articulated why we need the generic  
14 letter. If indeed there is substantive confusion or  
15 misunderstanding once we have published the generic  
16 letter, we would, as always, be more than willing to  
17 meet with the industry and make sure that there is a  
18 common understanding of what we're asking for.

19          This generic letter has been in process  
20 for a while. And we do believe we need to move  
21 forward to get the generic letter published and allow  
22 licensees the opportunity to engage with it. We will  
23 be mindful of any conflicts with other generic  
24 communications that are going forward where we may be  
25 imposing unreasonable time constraints and resource

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1 constraints on the licensees. That's something that  
2 we will pay attention to and go back and pulse with  
3 the generic communication staff and the other  
4 technical staff to make sure we're online there.

5 With that, unless the Committee has other  
6 questions for the staff, I believe we have presented  
7 to you the information that we wanted to present. And  
8 we look forward to receiving a letter from you. Thank  
9 you.

10 MEMBER BONACA: Any other questions for  
11 Mr. Mayfield?

12 MR. FALLON: I have a question. Mike  
13 Fallon with Constellation Energy.

14 For the license renewal applicants that  
15 have submitted under the GALL report, these cables are  
16 all in the scope of license renewal, have been  
17 addressed in their applications. Are they being asked  
18 to resubmit this information again?

19 MR. KOSHY: This is Thomas Koshy.

20 This generic letter will fall under the  
21 Part 50 program, in which case we are addressing,  
22 let's say, something more than what was addressed in  
23 the renewal program. So there is a need for making  
24 separate submittal to the NRC in response to this  
25 generic letter.

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1 MR. FALLON: All of the cables that you  
2 have addressed, all of the safety-related cables, are  
3 in the scope of license renewal. And whether they're  
4 480-volt or they're medium voltage, they're addressed  
5 in those applications.

6 MR. MAYFIELD: Okay. Let me comment.  
7 This is Mike Mayfield from the staff.

8 You raise a good point. It is something  
9 we will look at and make sure we're not asking you to  
10 unnecessarily duplicate information. But that is a  
11 fair question, something that we'll make sure that --

12 MEMBER BONACA: Well, I am not aware that  
13 license renewal applications have the summary of all  
14 of the failures that have taken place. We are going  
15 to get to the information.

16 MR. MAYFIELD: We don't think we are in  
17 conflict, but it's a fair question. And we'll look to  
18 make sure we are not asking an unreasonable question.

19 CHAIRMAN WALLIS: But you will be looking  
20 at plants which doesn't necessarily have license  
21 renewal in prospect.

22 Are we through with this item now or --

23 MEMBER BONACA: Are there additional  
24 questions for the staff, for industry, for us?

25 (No response.)

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1 MEMBER BONACA: If none, I think it's  
2 over.

3 CHAIRMAN WALLIS: Thank you.

4 MEMBER BONACA: And we open it up back to  
5 you, Mr. Chairman.

6 CHAIRMAN WALLIS: Now, I really am  
7 reluctant to take a break for an hour. I wonder if we  
8 couldn't work on -- is it okay, staff who is an expert  
9 on this? Can we work on Mario's letter on this issue  
10 right now on just a preliminary basis?

11 Let's go off the record and work on his  
12 letter for half an hour or an hour.

13 MEMBER SIEBER: We have to come back.

14 CHAIRMAN WALLIS: Can we do that? You're  
15 not ready? We do have a draft letter. Will the  
16 Committee agree to work on his letter? We can discuss  
17 it now, but I think we can go off the record and  
18 discuss our reaction to this generic letter and work  
19 on our letter until about 3:00 o'clock. Is that okay  
20 with the Committee?

21 So let's do that. We'll come off the  
22 record now, and we will work on this letter until  
23 about 3:00 o'clock. We'll have some discussion now  
24 off the record.

25 (Whereupon, the foregoing matter went off

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1 the record at 2:25 p.m. and went back on  
2 the record at 3:18 p.m.)

3 CHAIRMAN WALLIS: We will come back on the  
4 record, come back into session.

5 CHAIRMAN WALLIS: The next item on the  
6 agenda is, let's see now, interim staff guidance. Is  
7 that what it is?

8 MEMBER BONACA: Yes.

9 CHAIRMAN WALLIS: And I will again call on  
10 Mario Bonaca to lead us through this one.

11 MEMBER BONACA: Okay.

12 4) INTERIM STAFF GUIDANCE AGING MANAGEMENT PROGRAM

13 FOR INACCESSIBLE AREAS OF BOILING WATER REACTOR

14 (BWR) MARK I CONTAINMENT DRYWELL SHELL

15 4.1) REMARKS BY THE SUBCOMMITTEE CHAIRMAN

16 MEMBER BONACA: We have the staff here to  
17 provide us with an overview on the proposed license  
18 renewal interim staff guidance on steel containment of  
19 BWR Mark I containments.

20 We have reviewed a number of BWRs. And  
21 we have often asked the question on the status of the  
22 steel liner. And we have seen different proposals by  
23 licensees, some of them planned inspections, only  
24 metric inspections. Some of the others don't.

25 And the staff is using a successful

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1 process that has been successful in most of the  
2 license renewal applications to date, the ISG process,  
3 as a means of proposing an approach that they expect  
4 the licensees to follow regarding this particular  
5 item.

6 And so the staff has come here to give us  
7 an overview of this process and what they are  
8 proposing to do. And I will let the staff go ahead.  
9 I don't know if Mr. Gillespie or Mayfield --

10 MR. GILLESPIE: Yes. If I could, just  
11 some opening comments to put in context what Linh and  
12 Hans are going to go through. Not only did we do a  
13 couple already, but we've got something like seven  
14 Mark I's lined up in the queue. And we have a number  
15 of very controversial ones in New Jersey,  
16 Massachusetts, and Vermont, where there is actually a  
17 lot of public interest. And we had no position on the  
18 liner itself.

19 There are some caveats or I'm going to say  
20 some wiggle room in this position I'd like to  
21 highlight to the Committee by way of how the staff is  
22 approaching this because a question at the meeting  
23 yesterday at Monticello was, why is it different plant  
24 to plant if you're trying to apply a consistent  
25 approach.

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1           This is kind of an approach for the plant  
2           that's got almost like the optimum conditions, of  
3           which Monticello with their leakage control programs  
4           and some things they were doing was.

5           Browns Ferry, an earlier one, which  
6           committed to doing some other measurements, actually  
7           had an operating history of having leaks. And so they  
8           had moisture content in there. And so we actually  
9           have -- this is a minimum condition, as we would look  
10          at it.

11          And there are also some wiggle words,  
12          quite honestly, in this. And that's where it says  
13          first you have to establish a degradation rate,  
14          basically. And then if you get moisture, this  
15          basically treats moisture in the outside of the shell  
16          the same as visible accelerated corrosion on the  
17          inside.

18          And we're using the ASME code kind of  
19          enhanced inspection, but, instead of referencing the  
20          code, we described the enhanced inspection in it in  
21          case the code changes in the future.

22          So we're bringing definition to an  
23          equivalence to inside and outside indications. And  
24          there is still a lot of room on how you establish the  
25          rate and what is the credibility of the rate.

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1           And so if you have a history as a facility  
2 of having leakage and, therefore, moisture in there,  
3 then I think the Committee should expect the staff in  
4 establishing the rate in those wiggle rooms because it  
5 says if you have moisture, reestablish your rate again  
6 -- and the only way to factually reestablish the rate  
7 is likely do a UT measurement and then connect the  
8 dots again. Literally a simplistic way of looking at  
9 it is a regression line between the now additional  
10 point.

11           And so Hans in his efforts as a reviewer  
12 still has a lot of room in what are the uncertainties  
13 in establishing the rate. And it's those  
14 uncertainties which kind of differentiate one plant  
15 from another. How do you reduce those uncertainties  
16 given different operating histories?

17           And so that's really how come Monticello  
18 is different from Browns Ferry. It's strictly  
19 operating history and the uncertainty involved with  
20 known moisture leak on multiple occasions.

21           So, with that, let me turn it over to Linh  
22 because that's just kind of the context. Linh, take  
23 it away.

24           4.2) BRIEFING BY AND DISCUSSIONS WITH  
25           REPRESENTATIVES OF THE NRC STAFF

1 MS. TRAN: Good afternoon. My name is  
2 Linh Tran. And I'm the Project Manager with the  
3 Division of License Renewal. And this is Hans Ashar.  
4 He's a senior civil engineer with the Division of  
5 Engineering.

6 We are here this afternoon to present the  
7 proposed license renewal interim staff guidance for  
8 the inaccessible area of the BWR Mark I drywell  
9 containment shell.

10 The purpose of this ISG is to provide  
11 guidance to future applicants on the information that  
12 is needed to be included in the license renewal  
13 applications for addressing the inaccessible area of  
14 the drywell shell.

15 Now, the proposed ISG here does not impose  
16 any no new technical requirement. And in previous  
17 license renewal application review by the staff, we  
18 usually can obtain the information in the applications  
19 or through the request for additional information.  
20 And usually we will get the information from the  
21 applicant.

22 The information provided by the applicant  
23 is sufficient for the staff to make its determination.  
24 However, it is not the most efficient way because of  
25 the RAI back and forth. And in an effort to reduce

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1 the number of RAIs, this proposed ISG would identify  
2 the information up front, so for the future  
3 applicants, what they should include in the LRAs, I  
4 guess, to make the staff review more efficient,  
5 information such as inspection results or analysis  
6 that would help the staff make the determination  
7 whether the containment would perform its intended  
8 function for the period of extended operation.

9 Past operating experience in the Mark I  
10 steel containments indicate that when water is  
11 discovered in the bottom outside area of the drywell  
12 shell, the most likely cause could be the water  
13 seeping through the inaccessible area.

14 And in slide 10 in your handout, I have a  
15 picture of the drywell shell. It is an inverted light  
16 bulb. That indicates where the inaccessible area  
17 would be.

18 And this area is the area for the distance  
19 between the drywell shell -- did you do slide 10?;  
20 that's a picture there; yes -- where the surrounding  
21 concrete structure is too small for successful  
22 performance of visual inspection. That's the area  
23 right there. The gap is usually two inches, three  
24 inches.

25 CHAIRMAN WALLIS: You used the term

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1 "seeping." It's really any water that gets there from  
2 any reason whatsoever.

3 MS. TRAN: Correct.

4 CHAIRMAN WALLIS: And "seeping" is used as  
5 a general term.

6 MS. TRAN: Term, correct.

7 CHAIRMAN WALLIS: It may not seep. It may  
8 actually flow or --

9 MS. TRAN: Flow through, right.

10 MR. ASHAR: The area that we are  
11 concentrating on is between the shell, between the  
12 shell and the concrete in the back, in between the  
13 insulation --

14 MEMBER BONACA: No, no, no.

15 MR. ASHAR: Oh, I'm sorry. Wrong place.

16 MS. TRAN: Right. That's --

17 MEMBER APOSTOLAKIS: It is between what  
18 and what?

19 MR. ASHAR: Between the freestanding steel  
20 containment --

21 MEMBER BONACA: Between the light bulb and  
22 the --

23 CHAIRMAN WALLIS: There's a space right  
24 there.

25 MR. ASHAR: And mostly it is filled with

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1 insulation.

2 MEMBER APOSTOLAKIS: How does the water  
3 get there?

4 MR. ASHAR: Water gets into -- I'm going  
5 to explain. There are three basic sources of water  
6 that we have seen so far in the operating history.  
7 One can be called because of the -- we don't have any  
8 picture of the actual area.

9 MS. TRAN: No. This is it.

10 MR. ASHAR: This is it. In this area,  
11 there are bellows, bellows between the driver.

12 CHAIRMAN WALLIS: We saw them this  
13 morning.

14 MR. ASHAR: Yesterday you may have seen  
15 it, yes. And those bellows can crack. And then they  
16 can give a seepage into the trough, which collects the  
17 water.

18 Now, if the drain, which is supposed to  
19 drain out all the water from there, is full or is not  
20 working properly, the water can accumulate in the  
21 trough area, which has been kept just for that  
22 purpose. And it may all flow in coming to this area  
23 here.

24 CHAIRMAN WALLIS: It's lower.

25 MR. ASHAR: Because it is not showing

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1 better this particular detail, this is not good  
2 enough. Yesterday it was a very nice picture here.

3 CHAIRMAN WALLIS: But in order to refuel,  
4 you have to flood the upper region there.

5 MR. ASHAR: That is correct.

6 CHAIRMAN WALLIS: And some of that water  
7 can get down on the outside.

8 MEMBER APOSTOLAKIS: Okay. Thank you.

9 MS. TRAN: Now, in this --

10 VICE CHAIRMAN SHACK: Now, is that the  
11 only source of the water, I mean?

12 MR. ASHAR: No, no. There are two or  
13 three we found so far. Okay? One is a cracking of  
14 bellows. Second one is there is a refueling seal  
15 between the bottom of the trough, concrete trough.  
16 And there is a systematic way of draining it out  
17 through a drainage. But drain gets clogged. And the  
18 water comes through that area. It collects in the  
19 trough again and goes into between the concrete and  
20 the drywell shed.

21 Clog one is the reactor cavity wall. You  
22 have a stainless steel liner on it. And stainless  
23 steel liner gets -- they may do for any reason. And  
24 the water goes directly from concrete into that gap in  
25 between the two.

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1                   These are three reasons we have identified  
2                   so far.

3                   CHAIRMAN WALLIS:   So what clogs this  
4                   drain?  You said the drain gets clogged?

5                   MR. ASHAR:  It is because of negligence on  
6                   the part of the various --

7                   CHAIRMAN WALLIS:  Yes.

8                   MR. ASHAR:  -- not to monitor them  
9                   correctly.  Now they have come to their senses.  And  
10                  they started telling us they are monitoring, they are  
11                  doing this, they are doing that.

12                  MEMBER BONACA:  The drains are down from  
13                  the sand cushions, right?

14                  MR. ASHAR:  They are separate.  After the  
15                  water leakage, it is the sand cushion area.  Then  
16                  there are drains to -- actually, those drains were  
17                  meant for making sure the scent does not go away.  And  
18                  if it is, then they can collect them and put them back  
19                  the same.  That was the whole idea behind it.

20                  But it has been used nowadays as a  
21                  water-collecting/catching kind of a thing.  It is an  
22                  indirect function of that particular drain, but that  
23                  shows that water is coming in.  If the drains into  
24                  that room, if it shows any kind of water in the Torus  
25                  room, then it shows that there is a water leakage from

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1            somewhere up above that is getting into that area.

2                    CHAIRMAN WALLIS:  It drains into the room  
3 around the Torus?  It just drips down the wall  
4 somehow?

5                    MEMBER SIEBER:  Yes.

6                    MR. ASHAR:  The water comes from here.

7                    CHAIRMAN WALLIS:  That is a four-inch  
8 drain pipe.  It just drains down the wall?

9                    MR. ASHAR:  This is a sand pocket here.

10                   CHAIRMAN WALLIS:  Where does it go to when  
11 it drains out of that four-inch drain pipe?

12                   MEMBER SIEBER:  Onto the floor.

13                   CHAIRMAN WALLIS:  It just drains onto the  
14 floor?

15                   MR. ASHAR:  Unless they are collectors.  
16 Some people have started collecting them into some  
17 kind of a jar.  But most of them, yes, it was going  
18 onto the floor.

19                   MS. TRAN:  It goes onto the floor, yes.

20                   MR. ASHAR:  There is where they find out.

21                   MEMBER BONACA:  Now, some licensees have  
22 the drainage and some don't.  That depends on the --

23                   MR. ASHAR:  Well, some licensees have  
24 drains of the sand pocket area here.

25                   MEMBER BONACA:  Down at the low point.

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1 MR. ASHAR: Some people have drains at  
2 this area somewhere on the top of it.

3 MEMBER SIEBER: I think all of them --

4 MR. ASHAR: And if it is on the top of it,  
5 then there has to be sealing between --

6 MEMBER SIEBER: All of them have the top.

7 MR. ASHAR: -- the concrete and the --  
8 yesterday we saw in the Monticello case, it was a  
9 seal, which was a galvanized steel shield between the  
10 sand pocket area and the above area. So it prevents  
11 the water from getting in.

12 MEMBER BONACA: The had a few ounces of  
13 water, too, at some point.

14 MR. ASHAR: Yes, yes.

15 MEMBER BONACA: So they must have come  
16 also from the top.

17 MR. ASHAR: In the case of Monticello,  
18 there were no signs like that. We did not see.

19 MEMBER BONACA: There were only a few  
20 ounces of water, they said.

21 MEMBER MAYNARD: Yes, but they speculated  
22 that that water had actually come from another source  
23 because of the two or three-inch sand pipe there.

24 MEMBER BONACA: On the sand pipe there,  
25 yes.

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1 MR. ASHAR: They could explain when you  
2 ask that question.

3 CHAIRMAN WALLIS: Well, if it drains down  
4 that four-inch drain pipe, I would assume that the  
5 sand is full of water.

6 MEMBER SIEBER: Yes.

7 MEMBER MAYNARD: Right. That is not the  
8 low point.

9 CHAIRMAN WALLIS: There is a lot of water  
10 there before it drains down the pipe. The sand  
11 pocket, the sand --

12 MR. ASHAR: The sand pocket has to be  
13 sucked up completely.

14 CHAIRMAN WALLIS: The sand cushion is  
15 saturated with water first.

16 MR. ASHAR: Right.

17 MEMBER SIEBER: A number of plants have  
18 drains at the bottom of the sand --

19 MR. ASHAR: At the bottom --

20 MEMBER SIEBER: It would make more sense  
21 to --

22 MR. ASHAR: Some people have at the bottom  
23 of the sand pocket area drains with -- again,  
24 actually, it is to retain the sand inside. So that  
25 all flowing sand can be collected, but if they can use

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1 it at the --

2 MEMBER SIEBER: What is the purpose of the  
3 sand in the first place?

4 MR. ASHAR: Okay. See, this is the --

5 MEMBER SIEBER: Got a cushion?

6 MR. ASHAR: -- concrete area -- okay? --  
7 here. And this one when the shell expands under  
8 pressure --

9 MEMBER SIEBER: It is room to --

10 MR. ASHAR: -- it gives you some room to  
11 budge in.

12 MEMBER SIEBER: Expand? Okay. But the  
13 whole bottom of the shell sits on concrete? So you  
14 don't worry about corrosion below the sand?

15 MR. ASHAR: We do in some cases. We do to  
16 some extent, yes. If --

17 MEMBER SIEBER: How do you address that?  
18 You can't get to it because the top of it is concrete,  
19 too.

20 MR. ASHAR: If there is an appreciable  
21 collection of water in the sand bucket area, there is  
22 a chance that the water might have gone between the  
23 steel shell and the concrete.

24 MEMBER SIEBER: Right.

25 MR. ASHAR: But those cases, we have not

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1 found many so far except one, one case.

2 MEMBER SIEBER: You probably don't know --

3 MR. ASHAR: Yes, sir.

4 MEMBER SIEBER: -- you've got a concrete  
5 pad, a hemispherical pad, and then concrete above  
6 that.

7 MR. ASHAR: Right.

8 MEMBER SIEBER: And so there's no way to  
9 make a measurement.

10 MR. ASHAR: We know.

11 MS. TRAN: The interior.

12 MEMBER SIEBER: You can't get to the  
13 inside unless you cut the concrete out.

14 MR. ASHAR: Unless you cut the concrete or  
15 there are some new methods that have been developed in  
16 the NRC's research program, which have guided matters,  
17 but they are not yet being calibrated and haven't been  
18 used extensively by anybody.

19 So there are potential uses for those  
20 things under these examinations, but we have not seen  
21 them use it so far. We have just put one report from  
22 Oak Ridge National Lab in e-mail items so that people  
23 can look at that report and see if it is applicable  
24 for them.

25 CHAIRMAN WALLIS: Didn't someone yesterday

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1 say they actually made holes in that concrete in order  
2 to inspect?

3 MR. ASHAR: Yes.

4 MS. TRAN: Monticello.

5 MEMBER SIEBER: Next to the pedestal.

6 MR. ASHAR: Yes. They had to do that.

7 MEMBER SIEBER: But that is about as far  
8 as you can go because --

9 MR. ASHAR: That is as far as you can go  
10 right now, right.

11 MEMBER SIEBER: It's really thick in  
12 between.

13 MR. ASHAR: Yes. You can go up to here in  
14 the sand pocket area. Anything below that, if there  
15 is a --

16 MEMBER SIEBER: Of course, the sump is in  
17 there, too.

18 VICE CHAIRMAN SHACK: But typically,  
19 though, I mean, your experience is that there is no  
20 water there or that they all collect water?

21 MR. ASHAR: Typically the water has been  
22 very little. There has been water except in one case  
23 in the case of, I think it is, Dresden III, when they  
24 had to put firewater in here to extinguish a fire in  
25 the gravel area here --

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1 VICE CHAIRMAN SHACK: Well, that would do  
2 it.

3 MR. ASHAR: -- because of a summation  
4 fire. I don't know why.

5 MEMBER SIEBER: Good place to get a fire.

6 MR. ASHAR: But there was a fire there.  
7 They put a lot of water into it. And this whole area  
8 becomes soft here in the sand --

9 CHAIRMAN WALLIS: I'm interested to see  
10 when the sand gets full of water by some mechanism how  
11 it ever gets out. How does it ever get dry?

12 MR. ASHAR: With sand you --

13 CHAIRMAN WALLIS: If you had water access,  
14 suppose the bellows fails --

15 MR. ASHAR: Except the temperature --

16 CHAIRMAN WALLIS: -- water runs down.

17 MEMBER SIEBER: Aren't there drains at the  
18 bottom of this thing pushing it, right?

19 MR. ASHAR: Some have. This one is not  
20 shown here. There is a drain right here.

21 CHAIRMAN WALLIS: There is a drain there?

22 MR. ASHAR: There is a drain.

23 MEMBER SIEBER: Okay.

24 CHAIRMAN WALLIS: So that is how you draw  
25 out the sand? You just let it soak out?

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1 MEMBER SIEBER: It drips into where the --

2 MR. ASHAR: The temperature in the drywell  
3 in general in that area is close to about 130-140  
4 degrees. So it helps a little bit drying --

5 CHAIRMAN WALLIS: It evaporates the water?

6 MR. ASHAR: To some extent, not -- I mean,  
7 I have been given those explanations by various  
8 applicants, I know, what does this, but I do not  
9 believe everything they say. But --

10 CHAIRMAN WALLIS: Okay.

11 MS. TRAN: Slide five, please.

12 MEMBER SIEBER: You say the space between  
13 the concrete and the shell and the drywell is filled  
14 with insulation.

15 MR. ASHAR: Yes, there is insulation in  
16 there.

17 MEMBER SIEBER: What is it, some kind of  
18 fiber of some sort?

19 MR. ASHAR: I think so, yes. In one case  
20 we found that insulation was bad enough that it has  
21 chloride and all those contaminants. So when the  
22 water came in, it came with contaminated water. And  
23 that started accelerating the corrosion rate.

24 MEMBER SIEBER: That would do it. The  
25 insulation holds the water all up and down.

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1 MR. ASHAR: Up and down.

2 MR. GILLESPIE: Hans, I think it is  
3 important here that we're not talking in every case  
4 about any single containment.

5 MR. ASHAR: Right.

6 MR. GILLESPIE: What you have hit on is  
7 exactly what I tried to say in the beginning. The  
8 specific designs are so variant that we have really  
9 found out in doing these reviews that a Mark I  
10 containment is not a Mark I containment when you're  
11 looking at the drain details and the drain location.  
12 It's a function of the age, the AE. And, for example,  
13 Nine Mile actually put cameras up to ten-inch drains  
14 that they have and looked up in there, and it was  
15 dust.

16 And so before we assume that this thing is  
17 always full of water on everyone, there is a great  
18 variance between each unit. The design is different.  
19 And what licensees have done in the past to verify  
20 either the presence or absence of water is very  
21 different.

22 And so it's not like there is a universal  
23 answer to each one of these. Each one really is  
24 different.

25 VICE CHAIRMAN SHACK: Now, again, just on

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1 that, are all of the ones filled with insulation or  
2 are some of them actually air gaps?

3 MEMBER ARMIJO: I thought Monticello was  
4 an air gap based on yesterday's presentation.

5 MR. ASHAR: It is called air gap. I mean,  
6 in general, the terminology used is air gap.

7 VICE CHAIRMAN SHACK: But, I mean, is it  
8 typically filled with insulation?

9 MR. ASHAR: Typically it is a concrete  
10 General Electric design. It has the insulation in  
11 most cases. There might be a plant or two that may  
12 not have it available, but there might be some plants.

13 MEMBER SIEBER: You almost need it to be  
14 the form for pouring the concrete.

15 MR. ASHAR: Right, exactly.

16 MEMBER SIEBER: You need something in  
17 there to do that. Otherwise you don't have a gap at  
18 all. And one of the ways you get water down there is  
19 you have to take that refueling seal out after you  
20 refuel in order to put the drywell back together. And  
21 the process of doing that leaves a lip of water --

22 MR. ASHAR: Right.

23 MEMBER SIEBER: -- all around where the  
24 seal --

25 MR. ASHAR: Right.

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1 MEMBER SIEBER: -- used to be. It can  
2 only go down.

3 CHAIRMAN WALLIS: Now, we had a plant  
4 recently which had bulges in this realignment.

5 MR. ASHAR: I want to clarify two things.  
6 Okay?

7 CHAIRMAN WALLIS: It was Brunswick.

8 MR. ASHAR: There is a problem with the  
9 terminology. The first thing, when we talk about the  
10 drywell shell, it is a freestanding drywell steel  
11 shell. And when we talk about the liner, it is  
12 attached to concrete with some kind of anchorages.

13 And that is where we use the word "liner."  
14 But I have seen people using very loosely "drywell  
15 liner" here. It is not true. Okay? We are going to  
16 clarify the terminology in the next -- there is no --

17 MEMBER SIEBER: The one plant that has the  
18 liner, the shell, the structural member is the  
19 concrete, the subject of the code.

20 CHAIRMAN WALLIS: Yes, that's right.

21 MEMBER SIEBER: So you can tolerate some  
22 amount of corrosion as long as you --

23 CHAIRMAN WALLIS: So the liner just sits  
24 on the --

25 MEMBER SIEBER: -- maintain tightness.

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1 CHAIRMAN WALLIS: Okay. So the liner sits  
2 on the concrete, which is why it bulges.

3 MEMBER SIEBER: Just in that one plant.

4 CHAIRMAN WALLIS: This one is  
5 freestanding, this one.

6 MEMBER SIEBER: Yes.

7 MR. ASHAR: The one we are showing is a  
8 freestanding shell plus the liner.

9 MS. TRAN: Okay. Slide five. For some  
10 applications, just the information provided was  
11 included in the various sections of the LRA. And for  
12 other applications, the information was obtained to  
13 request for additional information.

14 As a result, the proposed ISG recommended  
15 that future applicants provide a plant-specific aging  
16 management program that would address the loss of  
17 material for the accessible area of the drywell shell.

18 So the recommendations that the applicant  
19 should be included in there, in the aging management  
20 program to develop a corrosion rate that is really  
21 inferred from past UT examination or establish a  
22 corrosion rate using representative samples in similar  
23 operating condition.

24 CHAIRMAN WALLIS: I would think the  
25 corrosion rate was so low that it would be difficult

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1 to measure. Really, you could say that it's less than  
2 a certain amount.

3 MS. TRAN: Less than, then. No minimum  
4 design.

5 CHAIRMAN WALLIS: That's good enough. You  
6 don't actually want them to determine what it is  
7 because you might be so low that you can't measure it.  
8 But if it's less than a certain amount, that would be  
9 acceptable, wouldn't it?

10 MR. ASHAR: In general, subsection IWE of  
11 the ASME code allows close to about ten percent  
12 allowance --

13 CHAIRMAN WALLIS: I know, but --

14 MR. ASHAR: -- some localized corrosion.

15 CHAIRMAN WALLIS: But if there is no water  
16 there, the corrosion rate may be essentially zero.

17 MS. TRAN: Correct.

18 CHAIRMAN WALLIS: And so establishing a  
19 zero thing is very difficult to do.

20 MEMBER SIEBER: Really, what you are  
21 trying to do is to determine how close you are to  
22 min wall.

23 MR. ASHAR: The min wall, right, minimum  
24 wall.

25 MEMBER SIEBER: And by plotting the

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1 reduction in thickness, you can determine when you are  
2 going to hit min wall. At that point you no longer  
3 meet the code for that pressure vessel.

4 VICE CHAIRMAN SHACK: How do I do this?  
5 Do I have to have multiple UT readings from that  
6 inaccessible portion of the shell? Can I demonstrate  
7 that mine is always dry?

8 MEMBER MAYNARD: You could develop a way  
9 that you had data from the --

10 MR. ASHAR: Two in the same location.

11 MEMBER MAYNARD: If an applicant comes in  
12 and they don't have previous data, I'm not sure how  
13 they develop a rate.

14 MS. TRAN: This is what we learned in  
15 putting this together. They will have one point at  
16 the beginning, you know, the design of the fabrication  
17 point. And then as a result of generic letter 87-05,  
18 most applicants, I mean, yes, have another data point.  
19 So when using that, they could develop some kind of --

20 VICE CHAIRMAN SHACK: Again, that is very  
21 specific. How many data points did they take when  
22 they made those UT measurements? How many locations?

23 MS. TRAN: Eighty-seven? Do you know?

24 MR. ASHAR: Yes. Generally in response to  
25 87-05, a number of -- now I have to say licensees, not

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1 applicants -- licensees have taken that kind of  
2 approach that they will look at four points in four  
3 sectors --

4 VICE CHAIRMAN SHACK: Four quadrants.

5 MR. ASHAR: -- because they don't remove  
6 the sand. They just have the sand. It's not like  
7 Oyster Creek. So what they do is they chip out the  
8 concrete in certain areas and then take the  
9 measurements and in response to 87-05.

10 And the second reading they take is two  
11 years or so after. That gives them a closer rate at  
12 the same location. It isn't delicate science that,  
13 hey, something is going on. Then they do more work.

14 VICE CHAIRMAN SHACK: Now, again, from  
15 Monticello, they don't seem to have maintained those  
16 as access ports.

17 MEMBER SIEBER: No.

18 MR. ASHAR: No, they don't. I mean, they  
19 can get to it if they have to, but they don't maintain  
20 them because they --

21 MEMBER SIEBER: That becomes another  
22 pocket for corrosion --

23 MR. ASHAR: Yes, right. It becomes --

24 MEMBER SIEBER: -- because there is  
25 moisture inside the containment.

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1 MR. ASHAR: Right.

2 MEMBER SIEBER: In the sump is actually  
3 that floor there. The sump is built into the floor.  
4 And so every loose water, amount of water, ends up in  
5 that space where the drywell liner and the concrete  
6 meet.

7 So they have to fill it up. They have to  
8 do something. Otherwise you would have a pocket of  
9 water sitting there.

10 CHAIRMAN WALLIS: I am still a little  
11 puzzled. I would think that the corrosion rate is so  
12 low that it's within the uncertainty in the ultrasound  
13 measurements.

14 MR. ASHAR: If it is low, they will report  
15 as low.

16 MS. TRAN: At least we will have --

17 MEMBER SIEBER: Carbon steel water and --

18 CHAIRMAN WALLIS: There's no water there.

19 MR. GILLESPIE: As it happens with real  
20 applicants, we're looking at corrosion rates like 17,  
21 18 ml a year in some cases.

22 CHAIRMAN WALLIS: There is water there.

23 MR. GILLESPIE: Well, yes. And people are  
24 seeing some evidence of corrosion. In another case,  
25 Nine Mile case, they did these measurements. And then

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1 they have a high-corrosion area on mild carbon steel  
2 at the water line in the Torus.

3 And what they did was they took that rate  
4 as a conservative estimate, where they know water is,  
5 and applied it to their liner and say, "Okay. We've  
6 got 38 years to go here."

7 And so people actually have come up with  
8 ways given these points and other representative  
9 carbon steel areas within their area that they do  
10 measure because they're in harsher environments and  
11 applied that as a representation to this in order to  
12 show that they could make it past the renewal period  
13 or at least until the next measurement that they might  
14 commit to take.

15 And so so far each licensee that we have  
16 had an opportunity to both finish our review or  
17 interface with so far has actually been extremely  
18 consistent with this position. And so they have  
19 actually figured out how to do it.

20 And there is other carbon steel in the  
21 Torus, actually in a wet environment, which gives you  
22 a noticeable rate, as it happens, particularly where  
23 some of the liners have blistered and bubbled, which  
24 is a whole other issue, that they can apply to this.

25 It's a conservative application. You

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1 know, if it doesn't work, then they have to do  
2 something else to convince us that the rate is okay.

3 So when we talk the nebulous philosophy,  
4 it gets harder, but I think when you get to specific  
5 plant situations, pardon the pun, but it's concrete.  
6 And so they have kind of come up with ways to use the  
7 generic point, the generic letter issue points.

8 In fact, in Vermont Yankee's case, they  
9 actually had leakage and did extra measurements  
10 consistent with the ISP, which wasn't issued when they  
11 did this some years ago. And so they have preserved  
12 those extra points.

13 And so it just happens that these plants  
14 actually have this information sitting there. They  
15 just haven't used it in this application before. And  
16 this is clarifying. We expect you to use it in this  
17 application.

18 Go ahead, Linh.

19 MS. TRAN: I guess now where degradation  
20 has been identified in accessible area of the drywell,  
21 meaning in the interior area of the drywell, the  
22 applicant should provide an evaluation that would  
23 address the condition of the inaccessible area of a  
24 similar condition or find something in the interior  
25 area. They should have an evaluation for that.

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1 Now, to assure --

2 MEMBER APOSTOLAKIS: How does one do that?

3 MR. ASHAR: Let me. The actual, this is  
4 just what we have seen.

5 MEMBER APOSTOLAKIS: That's okay. You  
6 don't have to show it.

7 MR. ASHAR: Okay. This is the requirement  
8 we set in after when we endorsed IWE, IWL into  
9 50.55(a) in the rule, that if they find something in  
10 the accessible area, they ought to go and look in the  
11 surrounding inaccessible area to see if there is  
12 anything going on.

13 A lot of PWR licensees, for example, have  
14 found that at the junction of the steel liner of the  
15 concrete containment and the concrete floor, they have  
16 moisture barriers generally. And their moisture  
17 barrier gets damaged. The borated water many times go  
18 in. And it starts corroding the inside area. It  
19 shows up a little bit on the upper side.

20 So they would do examination and find out  
21 what is going on. And they find the moisture barrier  
22 could be the culprit. They have to change the  
23 culprit. They ought to go inside. They ought to take  
24 out the corrosion.

25 So that's the reason this problem has been

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1 in about the inaccessible. In accessible area you  
2 have corrosion. You would look into the joining  
3 inaccessible area to find every --

4 MEMBER APOSTOLAKIS: You will look into  
5 the inaccessible area. That helps make it accessible  
6 or not?

7 MR. ASHAR: No. If you see some rusting  
8 or something on the --

9 MEMBER APOSTOLAKIS: You can look at it.  
10 Why isn't it accessible?

11 MR. ASHAR: No, no. The whole area is  
12 that you see something in an accessible area. And  
13 they investigate as to what is going on underneath  
14 that particular area. The basic focus in the room was  
15 the PWR containments. That is where it was found in  
16 so many of them. And still we are finding it.

17 MEMBER ARMIJO: But it is possible you  
18 could have damage occurring in an inaccessible area  
19 and have nothing in the accessible.

20 MR. ASHAR: That's quite right.

21 MEMBER SIEBER: Possible.

22 MR. ASHAR: That is why this type of --

23 MEMBER ARMIJO: Very possible. I mean,  
24 it's --

25 MS. TRAN: That is why we use accessible

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1 area as the indication for the accessible area for the  
2 augmented inspection. They have to do visual in the  
3 surface. And then if the surface area is accessible  
4 only from one side and they have to protect the wall  
5 thing by using ultrasonic --

6 MEMBER ARMIJO: I don't worry about the  
7 accessible. I just worry about the inaccessible and  
8 having no way of knowing just by looking at the  
9 accessible area. It's not a good --

10 MR. ASHAR: That is where this ISG kicks  
11 in because this ISG is focused on inaccessible area.  
12 This is one of the pointers, that if there is  
13 something going on in the accessible area, which you  
14 can see right away, then there is something going on  
15 and you will look at it.

16 MEMBER ARMIJO: That is the easy part.

17 MR. ASHAR: The ISG concentration, focus  
18 of this ISG, is the inaccessible areas.

19 MEMBER APOSTOLAKIS: But how does one  
20 suspect?

21 CHAIRMAN WALLIS: Yes, that's right. How  
22 does one suspect?

23 MEMBER APOSTOLAKIS: How do you suspect?

24 MS. TRAN: You find water or leakage on  
25 your --

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1 MEMBER APOSTOLAKIS: That is getting back  
2 to what Dr. Armijo is saying. That's not our worry.  
3 What if you don't find water? You still make some  
4 problem in the inaccessible area. Is that correct?

5 MEMBER ARMIJO: Yes, you could.

6 MEMBER APOSTOLAKIS: So how does one  
7 suspect that something is going on in the inaccessible  
8 area?

9 MEMBER BONACA: No. She says water.

10 MS. TRAN: Water is one. If you find  
11 water in the drain lines, water in the drain line, in  
12 the --

13 MEMBER BONACA: For example, if the seals  
14 -- I guess you are focusing on the seals and on the  
15 bellows, right?

16 MR. ASHAR: Right.

17 MEMBER SIEBER: The only way you can get  
18 water into the inaccessible area is to have it flow  
19 through the accessible area. So if you make a  
20 measurement in the accessible area --

21 MEMBER APOSTOLAKIS: Okay. That is a  
22 different --

23 MEMBER SIEBER: -- that gives you some  
24 kind of justification to extrapolate to the area you  
25 get.

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1 MEMBER APOSTOLAKIS: But that doesn't help  
2 much because it could have run down --

3 VICE CHAIRMAN SHACK: The water runs down  
4 and collects at the --

5 MEMBER SIEBER: Right.

6 VICE CHAIRMAN SHACK: It doesn't stay on  
7 the side of the --

8 MEMBER BONACA: That is why the real focus  
9 is the last bullet. And that's what they attempted to  
10 do, you know, to put in the seals and the bellows in  
11 the scope of license renewal. And this has been kind  
12 of debated with the industry.

13 CHAIRMAN WALLIS: This is a very weak  
14 statement, "if moisture is suspected." That's a very  
15 subjective --

16 MS. TRAN: Or detected.

17 CHAIRMAN WALLIS: If you have a suspicious  
18 nature, you would suspect it all the time.

19 MR. ASHAR: Subsection IWE in its  
20 IWE-1240, there's a number of items. This is the  
21 abbreviated form. A number of places where this could  
22 occur is very vividly described in there, IWE-1240 in  
23 the ASME code. And that is what we are invoking, but  
24 we did not write everything that is written in the  
25 IWE-1240.

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1 MEMBER APOSTOLAKIS: Now, you are really  
2 including SSCs that are identified as source of  
3 moisture and scope, source of moisture?

4 MR. ASHAR: Yes. For example, cracking of  
5 bellows.

6 MEMBER SIEBER: The refueling seal.

7 MR. ASHAR: I explained to you earlier.

8 MEMBER APOSTOLAKIS: Okay. That's what --

9 MS. TRAN: The refueling seal is not.

10 MR. ASHAR: Refueling seal.

11 MS. TRAN: So they have to put that in the  
12 scope of license renewal.

13 MR. ASHAR: This is what we are --

14 MEMBER APOSTOLAKIS: Okay.

15 CHAIRMAN WALLIS: Why don't they just  
16 require that they check the bellows for cracks  
17 routinely?

18 MR. ASHAR: It is not very easy to get to  
19 it. They can do tests. That's what they do most --

20 MEMBER SIEBER: It not the only place it  
21 can leak.

22 MR. ASHAR: Yes. And I say --

23 MEMBER SIEBER: They can leak along the  
24 edge.

25 MR. ASHAR: Yes. And this is what we want

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1 to have them in the scope of license renewal, so they  
2 maintain them in a condition where it is not leaking.

3 MEMBER MAYNARD: Well, by "suspected"  
4 here, don't you really mean if there has been some  
5 previous evidence that moisture has been there? You  
6 know, I suspect. I have a hard time dealing with what  
7 I might suspect, but I can deal with whether I have  
8 had any indications or evidence.

9 MS. TRAN: Yes. This is "suspect" or  
10 "detected" through your drain lines.

11 CHAIRMAN WALLIS: Well, if moisture is  
12 detected, now, that makes sense.

13 MEMBER MAYNARD: Yes.

14 MS. TRAN: It should be "detected,"  
15 instead of "suspected."

16 VICE CHAIRMAN SHACK: So if moisture has  
17 been detected any time in the life of this plant up  
18 until license renewal included? Is that what it says?

19 MEMBER APOSTOLAKIS: It is not really  
20 detected. Go ahead. You answered my question.

21 CHAIRMAN WALLIS: Well, just take out the  
22 "if" clause and say, "include."

23 VICE CHAIRMAN SHACK: Yes. Why not just  
24 include them?

25 MEMBER APOSTOLAKIS: I think "suspected"

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1 is broader because would that include a situation  
2 where you have seen moisture or water in a similar  
3 facility and you suspect it may happen in yours, even  
4 though you hadn't seen it? "Suspected" is broader.

5 MEMBER MAYNARD: Well, yes, but I think  
6 from a regulatory standpoint and from dealing with  
7 licensees, I think you need a little bit better  
8 definition rather than it just being somebody's  
9 opinion sitting there saying, "Well, I suspect there  
10 might be something there."

11 CHAIRMAN WALLIS: Suspected by whom?  
12 Inspector or is it --

13 MEMBER MAYNARD: Well, I like the  
14 "detected" or --

15 MS. TRAN: Detected. I think --

16 MEMBER BONACA: We had a discussion  
17 yesterday at Monticello that shows how difficult the  
18 issue is. I mean, we rely very much on subjective  
19 judgments and say, "Well, we don't think we ever had  
20 water."

21 CHAIRMAN WALLIS: You could simply say  
22 that "The ACRS suspects that there may always be water  
23 there. Therefore."

24 MEMBER APOSTOLAKIS: You guys must have  
25 had a hell of a meeting yesterday.

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1 VICE CHAIRMAN SHACK: In Monticello's  
2 case, they see no evidence of corrosion in '87, which  
3 was a fairly substantial operating period for them.

4 MEMBER APOSTOLAKIS: That's right.

5 MS. TRAN: Identified.

6 MEMBER ARMIJO: If they have good records,  
7 they have a good sound --

8 VICE CHAIRMAN SHACK: One data point.

9 MR. ASHAR: We have to draw things --

10 MEMBER ARMIJO: They don't have to do it.

11 MS. TRAN: So just to get back on --

12 CHAIRMAN WALLIS: You really fixed this  
13 up.

14 VICE CHAIRMAN SHACK: Why not just put  
15 these seals in scope and be done with it?

16 MR. ASHAR: This is what we tried to do  
17 earlier. And there is so much resistance from a  
18 number of applicants. I mean, I had to go to three or  
19 four RAIs over and above a lot of teleconferences to  
20 convince them to put this in the scope of license  
21 renewal. And so many people denied.

22 CHAIRMAN WALLIS: So now you have to  
23 convince them to suspect something?

24 MR. ASHAR: No. Now, with this ISG, if  
25 they have suspected sites, areas, then --

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1 CHAIRMAN WALLIS: But they don't want to  
2 do it anyway. They'll never suspect anything.

3 MEMBER APOSTOLAKIS: No. Presumably there  
4 will be some guidance what suspicion means.

5 MR. ASHAR: There is a guidance.

6 MEMBER APOSTOLAKIS: Yes.

7 MR. ASHAR: There is.

8 CHAIRMAN WALLIS: There must be.

9 MEMBER APOSTOLAKIS: It just doesn't say  
10 it in bullets.

11 MS. TRAN: Yes.

12 MR. ASHAR: I was looking for IWE-1240  
13 here. I don't have one.

14 CHAIRMAN WALLIS: Okay.

15 MR. ASHAR: But that is where it is fully  
16 described as to -- this is what we are invoking here  
17 basically.

18 CHAIRMAN WALLIS: You want to say  
19 something, "if there are indications of moisture" or  
20 something like that.

21 MR. KUO: If I may, Part 54 rule in the  
22 rule language in the SOC discussed this, saying if a  
23 component is in an environment that could have aging  
24 effect, say in the operating experience, anywhere in  
25 the industry or your specific plant, that there is

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1 such a degradation mechanism, degradation mechanism  
2 that could cause an aging effect, then an aging  
3 management program should be provided. That's what  
4 the Part 54 rule requires.

5 In other words, if this is a possible  
6 aging effect from the operating experience, then that  
7 is suspected. You would use the word "suspect." That  
8 happened before. We should not talk about the  
9 hypothetical aging effect, but it is an aging effect  
10 that we have seen before.

11 VICE CHAIRMAN SHACK: Right. That is why  
12 I can't understand why you can't just put the seals in  
13 scope. I mean, it's not a hypothetical event.

14 MR. KUO: Like Hans said, some people  
15 don't want to include the seal in the scope.

16 CHAIRMAN WALLIS: There are often people  
17 who don't want to do things, but you can say, "Do it."

18 MEMBER BONACA: What you want and what you  
19 get are two different things.

20 MR. GILLESPIE: I think you will find as  
21 a result of this ISG, fundamentally seals are in  
22 scope. Remember, seals and the refueling stuff are  
23 not safety basically. And so what we're doing is  
24 because of the effect of non-safety components on a  
25 safety component, we're bringing them into scope. So

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1 it's a bit indirect.

2 And so it shouldn't be a surprise that  
3 utilities don't want extra requirement on things that  
4 don't have any requirements on them now.

5 MEMBER BONACA: But, you know, one thing  
6 that we are learning from this license renewal process  
7 as we converge, it seems to me that the central issues  
8 are becoming the inaccessible or buried components  
9 that you can't look at, that you cannot measure. And  
10 that's natural because, I mean, these plants are going  
11 beyond some original design in certain components of  
12 the -- and I think that it is important that we focus  
13 on these inaccessible components and ask our  
14 questions, you know, how long can this live and what  
15 is the source of the problem. And here -- anyway --

16 MS. TRAN: Hans wanted me to read the  
17 IWE-1241, the examination surfaces, "Surface area for  
18 the typical location," "Typical location of such areas  
19 of those exposed to stand-in water, repeated wetting  
20 and drying, persistent leakage, and those with  
21 geometries that permit water accumulations,  
22 condensation, and biologicals attack." I mean, it is  
23 in the -- it tells the applicant the area.

24 Now, let's say if moisture is detected as  
25 suspected or identified --

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1 (Laughter.)

2 MS. TRAN: Now, we will agree that they  
3 found water. Okay? So they should include the  
4 component, the source of it, in the scope of license  
5 renewal. In addition, we need to identify the surface  
6 area.

7 Next slide. By implementing and  
8 augmenting inspection for the period of extended  
9 operation in accordance with the ASME section 11,  
10 subsection IWE and also for the examination shall be  
11 in accordance with section 11, subsection IWE-2500.  
12 And I did go over that a little bit earlier.

13 That means that surface area accessible  
14 from both sides should be visually examined and  
15 surface area that is only accessible from one side  
16 should be examined for wall thinning and using sonic  
17 thickness measurement method.

18 Now, after all of that, after all of the  
19 augmented inspection, the applicant should demonstrate  
20 that either corrosion is not occurring by performing  
21 those examinations or analysis to do analysis on the  
22 result or that corrosion is progressing so slowly that  
23 the age-related degradation will not jeopardize the  
24 intended function of the drywell to the period of  
25 extended operation.

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1 VICE CHAIRMAN SHACK: Just how thick is  
2 this light bulb again?

3 MR. ASHAR: The light bulb? It varies.  
4 From the top, it is thinner, very thin, right around  
5 half-inch to three-quarter-inch. As you go down near  
6 the knuckle area between the sphere and the upper  
7 part, it is spherical area. It is close to about .7,  
8 .6 inches. Then it again goes down up to six inches.  
9 And then at the bottom area is about one to one and a  
10 half inches in between the sand pocket area --

11 VICE CHAIRMAN SHACK: No. But, I mean,  
12 it's 17 ml a year.

13 MR. ASHAR: Oh, yes.

14 VICE CHAIRMAN SHACK: You're going to chew  
15 that at a pretty good clip.

16 MEMBER BONACA: If you find a hole in the  
17 liner, I mean, would you suspect some moisture there?  
18 I mean, what is --

19 CHAIRMAN WALLIS: Even my chassis of my  
20 car, which is soaked in salt, doesn't corrode at 17 ml  
21 per year, does it? It's really bad conditions if  
22 you've got --

23 MR. GILLESPIE: Yes. That actually is the  
24 two worst points that a particular --

25 CHAIRMAN WALLIS: Yes, very bad --

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1 MR. GILLESPIE: -- that they reported to  
2 us. What it does do, though, is say there is  
3 operating history out there in this utility  
4 environment, that we cannot take for granted that it  
5 can't happen.

6 CHAIRMAN WALLIS: Right.

7 MR. GILLESPIE: And that's the reason for  
8 the ISG. We are not going to make the assumption  
9 because we have operating history that says it's not  
10 necessarily a valid assumption in all cases that it's  
11 going to go slow. There has been evidence of this  
12 going faster than people would have originally  
13 anticipated in the designs.

14 MEMBER BONACA: But in some cases where we  
15 have questioned the bellows, particularly the seals,  
16 if you're in seals, then the answer is always, well,  
17 we have good drainage. So you are in a quandary. I  
18 mean, what leads you --

19 MR. ASHAR: There are a number of things  
20 that tells us. The first thing, the drains are not  
21 clogged any time in the past. The second thing,  
22 visual examinations performed in the areas, it was  
23 shown there are no telltale signs of water for a  
24 number of inspections there performed. Then they had  
25 to show us at the bottom in the drain line there was

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1 no water coming out anywhere.

2 So there are so many things that they  
3 would tell us before they convince us that there is  
4 nothing going on.

5 MR. GILLESPIE: Mario, I would also say  
6 that I think this came up in Monticello's case  
7 yesterday, --

8 MR. ASHAR: Right.

9 MR. GILLESPIE: -- where they didn't take  
10 credit for it, but they actually had a primer sprayed  
11 on the outside of the inaccessible area. And other  
12 licensees have different applications of codings on it  
13 also.

14 And so it's not one thing.

15 MEMBER BONACA: Yes, I know, but --

16 MR. GILLESPIE: Aging management is  
17 accumulation of codings, time of exposure, amount of  
18 water.

19 MEMBER BONACA: And the spray on the  
20 surface was 65 or 40 years ago practically, 1965. So,  
21 you know, right. I understand.

22 MR. GILLESPIE: But the environment is not  
23 such that there is anything in there to actually cause  
24 the paint to peel off either. So there's no one issue  
25 here.

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1 MEMBER BONACA: Yes. I understand.

2 MR. GILLESPIE: It's different pieces to  
3 try to give you reasonable assurance.

4 MEMBER BONACA: In fact, yesterday at the  
5 end of the conversation, it was the lady who was  
6 performing the inspections felt confident with that.  
7 I'm sure that if you go physically and look at it and  
8 get information, you know, you can build a credible  
9 case that there is no concern with moisture. So I  
10 accepted that yesterday.

11 MEMBER ARMIJO: But a case has to be made  
12 --

13 MEMBER BONACA: Yes, it does.

14 MEMBER ARMIJO: -- with documented data,  
15 not just --

16 MEMBER BONACA: Right.

17 MEMBER MAYNARD: Is there something that  
18 is done periodically to ensure that these drains are  
19 really open, like particularly the sand point drains  
20 and stuff, that they're not plugged in some way?

21 MR. ASHAR: Now they are committing to  
22 those things. They have ensured those things, yes.

23 VICE CHAIRMAN SHACK: You'll find out when  
24 you have a leak.

25 MEMBER SIEBER: A sand pocket drain is a

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1 four-inch pipe. So they're hard to plug.

2 VICE CHAIRMAN SHACK: Yes.

3 MEMBER BONACA: I believe we have also  
4 some comments from the industry.

5 MS. TRAN: Right. Yes.

6 MEMBER BONACA: So shortly we'll get to  
7 those.

8 MS. TRAN: I am almost done. Now, if the  
9 intended function of the drywell cannot be met, the  
10 applicant can identify actions that will be taken as  
11 part of the aging management program to ensure that  
12 the integrity of the drywell would be maintained  
13 through the period of extended operation.

14 Last slide. Now, the drywell shell  
15 concern has already been addressed for the reactor's  
16 initial 40 years' licenses and relevant plants that  
17 have received a renewal license, as indicated in the  
18 left column there.

19 Now, the staff is in the process of  
20 reviewing the plants in the middle column. And the  
21 third column represented the remainder of the plants  
22 with the Mark I steel containment design.

23 Not all the plants in the third column,  
24 however, have announced their intention to renew their  
25 license, but the future review that's listed on the

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1 right side.

2 This concludes my presentation. So we can  
3 entertain any additional questions that you might  
4 have.

5 MEMBER BONACA: You don't have to request  
6 questions.

7 CHAIRMAN WALLIS: Ell, I suspect there  
8 might be some more questions.

9 (Laughter.)

10 MEMBER SIEBER: I don't know what they  
11 would be that we haven't already asked.

12 MEMBER BONACA: Any additional questions?

13 (No response.)

14 MEMBER BONACA: None. So we thank you for  
15 a very good presentation.

16 MS. TRAN: Thank you.

17 CHAIRMAN WALLIS: You have been here all  
18 day, Alex.

19 MR. MARRION: I know. Can I get one of  
20 those little name tag things? I'll just put it on.

21 (Laughter.)

22 MR. MARRION: Good afternoon. My name is  
23 Alex Marrion. I'm Senior Director of Engineering with  
24 NEI. And with me I have James Ross, who is the senior  
25 project manager with lead responsibility for license

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1 renewal. He's here to keep me out of trouble. He  
2 should have been here earlier.

3 I just want to make a couple of general  
4 comments. Based upon comments that the NRC made about  
5 the uniqueness of the specific plant designs, we feel  
6 that this is not really a generic issue, but it's  
7 appropriate to address it on a plant-specific basis in  
8 accordance with the uniqueness of the designs. And I  
9 think Frank Gillespie brought that up.

10 This is not a new issue. It's been  
11 addressed by the licensees in the past. There was a  
12 generic letter, 8705. And inspection requirements  
13 were incorporated into NRC regulations when NRC  
14 endorsed the ASME code subsection IWE as part of an  
15 update of 10 CFR 50.55(a).

16 Because that was already regulatory  
17 requirements, utilities were resisting the idea of  
18 imposing an additional regulatory requirement given  
19 that there wasn't sufficient evidence to indicate that  
20 the current requirement was not adequate if that makes  
21 sense.

22 The particular interim staff guidance is  
23 out for comment. Right now comments are due the 8th  
24 of June. We intend to submit comments on behalf of  
25 the industry.

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1           Most of the comments will be of a  
2 clarifying nature to make sure we understand the  
3 language, et cetera, which brings me to a more generic  
4 communication process issue. You know how I feel  
5 about generic communications based upon comments I  
6 made earlier.

7           The one thing that is not clear to us as  
8 an industry is why there is a need for an ISG process  
9 to begin with given that the NRC already has a  
10 well-established generic communication process that  
11 could be used as a vehicle for communicating staff  
12 guidance going forward.

13           So now we have generic communications.  
14 And we also have interim staff guidance, two separate  
15 processes that basically overlap. So we're going to  
16 continue making that point with every opportunity we  
17 have.

18           Lastly, I understand some question has  
19 been raised about the idea of continuing or the idea  
20 of imposing ultrasonic testing requirements. I want  
21 to make it clear that the current requirements that we  
22 currently have are for a graded approach to a visual  
23 examination.

24           And depending upon what you find, you do  
25 a more comprehensive examination, but the first step

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1 is a visual. And that's basic --

2 CHAIRMAN WALLIS: How do you visually  
3 inspect these inaccessible areas?

4 MR. MARRION: Well, as you heard from the  
5 staff, you do an examination of the inaccessible areas  
6 based upon what you find of the accessible areas if I  
7 have characterized it properly in what the staff was  
8 proposing.

9 And for the Mark I's, we intend to  
10 continue that process going forward. And we will be  
11 commenting accordingly on the ISG comments.

12 CHAIRMAN WALLIS: You have to be able to  
13 access some place which is relatively typical of the  
14 inaccessible places in order to do that.

15 MR. MARRION: Yes. I'm not familiar with  
16 the details of what that is, yes.

17 That's all I have, sir.

18 MEMBER ARMIJO: I just think that is  
19 fundamentally unsound because you have, really, a  
20 crevice condition in that sand pocket area. It's not  
21 at all represented by the accessible area.

22 And so looking at a safe location to make  
23 a judgment of a susceptible location seems to me a  
24 waste of time. I mean, if the accessible area is  
25 highly corroded, you can be sure that the inaccessible

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1 is in bad shape.

2 MR. MARRION: Right.

3 MEMBER ARMIJO: But the converse isn't  
4 true.

5 MEMBER APOSTOLAKIS: But didn't Jack say  
6 that for the water to get to the inaccessible area, it  
7 has to go through the accessible areas?

8 MEMBER ARMIJO: Yes, but it doesn't stay  
9 there.

10 VICE CHAIRMAN SHACK: It doesn't stay  
11 there.

12 MEMBER ARMIJO: It flows.

13 VICE CHAIRMAN SHACK: You have got a drain  
14 right at that thing. I mean, there is no way for  
15 water to really accumulate --

16 MEMBER APOSTOLAKIS: It is not  
17 accumulating.

18 VICE CHAIRMAN SHACK: -- in that  
19 accessible area.

20 CHAIRMAN WALLIS: But it gets to the sound  
21 --

22 MEMBER APOSTOLAKIS: But you are going to  
23 see some moisture or something.

24 MEMBER ARMIJO: You can make a case that  
25 if it's always been dry, that's your best case. You

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1 have good data.

2 MEMBER MAYNARD: I thought part of that,  
3 it would depend on what you include as a visual area  
4 for what you base -- if you're including the drains  
5 and if there is any moisture coming out of the sand  
6 drains or anything like that, well, that might be  
7 appropriate. But if you're saying that all you have  
8 to do is just visually look at the inside of the  
9 container there, that you don't have to do anything  
10 else.

11 But if you include as part of what you  
12 find visually results of drains and other things --

13 MR. MARRION: That is a comprehensive  
14 examination requirement that's in 50.55(a) right now.

15 Thank you. And I appreciate the time I  
16 spent with this illustrious body today.

17 (Laughter.)

18 MEMBER KRESS: We are honored to have you.

19 MEMBER BONACA: If there are no further  
20 questions, first of all, I want to thank the staff for  
21 their presentations and for the information. And then  
22 I'll turn the meeting back to you, Chairman.

23 CHAIRMAN WALLIS: Thank you very much.

24 We are finished with our formal  
25 presentations for the day.

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1 MEMBER KRESS: We don't have a letter on  
2 this particular issue?

3 MEMBER BONACA: No.

4 MEMBER KRESS: This was just a briefing?

5 CHAIRMAN WALLIS: Just a briefing. It was  
6 just a briefing.

7 MEMBER BONACA: There is no impact  
8 because, I mean, it was helpful because, again,  
9 yesterday we had a --

10 CHAIRMAN WALLIS: We don't need that --

11 MEMBER KRESS: Are we going to give some  
12 feedback now or anything on what we've heard or do you  
13 think the questions are sufficient?

14 VICE CHAIRMAN SHACK: The questions were  
15 sufficient.

16 CHAIRMAN WALLIS: Unless you have another  
17 point you want to make. Do you want to make some  
18 point?

19 MEMBER KRESS: Well, my point was that I  
20 just don't like this round-about way of doing things  
21 in the sense that I think there's a fatal flaw in  
22 trying to use the accessible areas to determine  
23 whether or not there is a problem in the inaccessible  
24 areas.

25 I would do what Bill Shack just said. Why

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1 not just include those sources of moisture within the  
2 scope?

3 VICE CHAIRMAN SHACK: Well, I think --

4 MEMBER KRESS: I know it has been resisted  
5 by the industry, but it doesn't seem like that big of  
6 a burden to me. I think that's the real solution.  
7 And that's what they're after, but they're trying to  
8 do it in a round-about way.

9 VICE CHAIRMAN SHACK: I also think a  
10 techie could come up with a way to measure those  
11 thicknesses.

12 MEMBER KRESS: Show me that way, and that  
13 may be okay. That's possible.

14 MEMBER SIEBER: Well, when you put the  
15 refueling seal in the scope, all you're doing is  
16 establishing an aging management program for that.  
17 That doesn't prevent leakage necessarily because there  
18 may be something other than the aging that causes the  
19 leaking.

20 MEMBER KRESS: Okay. Maybe. Maybe I am  
21 flawed.

22 MEMBER SIEBER: You could twist it, and  
23 now it leaks.

24 CHAIRMAN WALLIS: You should probably  
25 inspect a more susceptible area, which is a sand

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1 pocket.

2 MEMBER SIEBER: I think you have to deal  
3 with the --

4 MEMBER BONACA: In the past we left it to  
5 the --

6 MEMBER SIEBER: -- rather than deal with  
7 something that is removed from it.

8 MEMBER BONACA: In the past we left it to  
9 a licensee to have a choice. For example, in Browns  
10 Ferry, the staff was asking for inspection of the  
11 seals. They fought that. We left them open, either  
12 that or UT the liner in the vulnerable locations. And  
13 they chose to UT the liners.

14 The burden is inaccessibility because  
15 there is going to be that every ten years. And when  
16 they do the ISR, they are in containment. And they  
17 physically can then perform most of the utilities in  
18 those locations. So we left open those possibilities.

19 I take your point, and I think the  
20 Committee should decide. Should we have a comment on  
21 this or -- the intent wasn't one of providing a  
22 letter. This was an informational presentation, but  
23 --

24 CHAIRMAN WALLIS: I think the staff has  
25 heard our comments. It was a preliminary sort of

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1 thing. And that is probably good enough for now.

2 MR. GILLESPIE: We appreciate the comments  
3 because, as Mario said, underground cabling, piping,  
4 and this kind of large passive component are really  
5 becoming kind of the end point. Everything else we  
6 know how to deal with for the most part.

7 But I will say in this case -- and let me  
8 take Browns Ferry. You might say, well, why did  
9 Browns Ferry choose UT versus the seals. Browns Ferry  
10 actually had unidentified sources of leakage. And he  
11 said versus trying to identify every source of leakage  
12 because they didn't know where it was that their  
13 cheapest way out was actually to do the UT.

14 But they got the idea that we wanted to  
15 wait. And you had to assure us this thing was going  
16 to be okay relative to thickness.

17 VICE CHAIRMAN SHACK: That sand pocket is  
18 pretty big. I mean, you can have a fair amount of  
19 moisture in there that you're never going to see  
20 coming out of those drains. And, yet, you could have  
21 attack over a reasonable fraction of that.

22 MEMBER SIEBER: There are oodles of  
23 surface in there for the moisture to collect on.

24 MR. GILLESPIE: But, again, the locations  
25 of the drains are plant-specific. Some plants have

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1 seals, as Monticello had over it. Some places have a  
2 liner or coding on the other side of the surface.

3 VICE CHAIRMAN SHACK: Well, a bottom drain  
4 would give me a whole lot more comfort than that top  
5 drain would.

6 MR. GILLESPIE: Yes. The other thing is  
7 the sand is very compacted.

8 MEMBER KRESS: Have you ever tried to  
9 drain moisture out of the sand from the bottom? It  
10 doesn't come out.

11 MR. GILLESPIE: I don't want to pooh-pooh  
12 it, but the idea that this is a 130-degree area also  
13 --

14 VICE CHAIRMAN SHACK: You drive it out  
15 with --

16 MR. GILLESPIE: And so you're going to  
17 drive it out. And so you've actually got the occasion  
18 to get water in there about 20 days every 18 months or  
19 24 months depending on the fuel cycle someone is on  
20 and how long it's flooded. And that's why we've  
21 started to key into visual. You might say, visual  
22 leakage from someplace kicks you into needing to do a  
23 UT.

24 Now, what this inter-staff guidance  
25 position does do is says the identification of

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1 moisture, basically leakage, is equivalent to the  
2 visual recognition of accelerated corrosion on the  
3 inside. And that's an important distinction, which  
4 never existed before.

5 So for the inaccessible areas, we're using  
6 the indirect indication of seeing water as kind of an  
7 assumption that you have to do the same thing as if  
8 you saw accelerated corrosion on the inside. That  
9 gets us a measurement on an event basis.

10 And so someone who is sworn to keeping  
11 this thing dry, if they have an event during a  
12 refueling where they get leakage in there, now they're  
13 obligated to do something which is a bit more onerous  
14 and reestablish their rate.

15 It's not perfect. By the way, there are  
16 two inaccessible areas. We should be clear on that.  
17 There is the inaccessible area in the air gap. And  
18 then there's this inaccessible area that's layered on  
19 the bottom between the two concrete layers, which is  
20 really probably the most difficult area, but it was  
21 designed to last 40 years. It is totally lined with  
22 concrete. And then you've got this temperature  
23 gradient.

24 CHAIRMAN WALLIS: Is 40 years good enough  
25 with license renewal, though?

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1 MR. GILLESPIE: Now, it was originally  
2 designed for 40 years, but that was kind of an  
3 assignment. But now if you have no evidence of in  
4 leakage or water in there, I mean, again, it's  
5 indirect stuff. It's almost like a circumstantial  
6 case we're acting --

7 CHAIRMAN WALLIS: Concrete is not dry all  
8 the time.

9 MR. GILLESPIE: Concrete is porous  
10 material, and it is not dry all the time. And so then  
11 you could ask questions. A fair question in the aging  
12 management program is, what are you doing about  
13 groundwater? And do we have any evidence of  
14 groundwater?

15 We asked that from Nine Mile. And I think  
16 we're coming. I signed up the draft SE this morning.  
17 So I think next month we're probably coming on Nine  
18 Mile. They have actually got alarms on their drains  
19 if moisture is detected.

20 So every plant is doing some unique  
21 things.

22 CHAIRMAN WALLIS: Moisture can come out of  
23 the concrete. There is a lot of concrete. There is  
24 a late curing of the concrete which goes on for a long  
25 time. Then it can be damp. It doesn't have to be

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1 very damp --

2 MR. GILLESPIE: Right.

3 CHAIRMAN WALLIS: -- to produce some  
4 chemical reaction.

5 MR. GILLESPIE: What is the impact? This  
6 is what I don't know, is what is the impact of this  
7 temperature gradient.

8 CHAIRMAN WALLIS: You don't have oxygen.  
9 So that is probably what protects you.

10 MR. GILLESPIE: And so there is a number  
11 of things that -- we're doing our best, appreciate the  
12 Committee's comments, and more than happy. If anyone  
13 else has any better ideas, we would love to have them,  
14 but this ISG was an effort to send a benchmark for  
15 basically the best-performing plant on liners.

16 It has no moisture. What if you get  
17 moisture? How do you establish your rate? This is  
18 kind of putting out, in essence, that they now know we  
19 do expect a rate to even be established. We didn't  
20 have that in writing before.

21 CHAIRMAN WALLIS: We won't comment on it,  
22 and we hope it works out.

23 MR. GILLESPIE: Well, feel free to comment  
24 on it. We're happy to have comments. NEI is going to  
25 feel free to comment on it.

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1 CHAIRMAN WALLIS: We won't.

2 MEMBER BONACA: Certainly we will comment  
3 on individual applications.

4 MR. GILLESPIE: Yes. I do think this is  
5 middle ground we are wrestling with here because I do  
6 agree with Alex that the individual designs that we're  
7 applying this concept to are significantly different.  
8 In critical questions, like locations of drains, some  
9 are going to be more susceptible than others.

10 As I said, Browns Ferry said we have  
11 unidentified leakage. We know we have leakage. It's  
12 not a lot. UT is our answer. It's the only way that  
13 could give us positive confirmation.

14 CHAIRMAN WALLIS: Have they been having  
15 leakage on their reactor which has been shut down for  
16 all that period of time, unidentified leakage?

17 MR. GILLESPIE: Well, remember, we license  
18 units I, II, and III. The floor wasn't flooded on 1.  
19 So they haven't had any leakage on I for a long time.

20 CHAIRMAN WALLIS: They think they haven't.  
21 They could have an unidentified leakage.

22 MR. GILLESPIE: They had some unidentified  
23 leakage from refuelings in the other units, and they  
24 chose UT.

25 MEMBER SIEBER: They have them for fuel

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1 for --

2 MR. GILLESPIE: By the way, this is a very  
3 high-dose area, too. And so the question here isn't  
4 money.

5 MEMBER BONACA: Not only they. I mean --

6 MR. GILLESPIE: It's going to be dose.

7 MEMBER BONACA: Where the seals are, it's  
8 a very high red area.

9 MR. GILLESPIE: Yes.

10 MEMBER BONACA: Not down in the sand  
11 pocket.

12 MR. GILLESPIE: It depends on where you're  
13 at. You're directly under the vessel.

14 CHAIRMAN WALLIS: No one is going to go  
15 down there.

16 MR. GILLESPIE: My understanding from the  
17 licensees is from a radiological perspective, this is  
18 not an area you want to take lightly doing extra  
19 measurements over and above what you really need to  
20 confirm your --

21 CHAIRMAN WALLIS: BSBWR has hatches that  
22 you go in into the reactor pedestal area.

23 MEMBER BONACA: We were told by TVA that  
24 it is not a high red area because it is well below the  
25 --

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1                   MEMBER KRESS:  Graham, I was wondering if  
2                   the staff is considering a user need letter to  
3                   Research to try to develop a way to do this more  
4                   definitively, maybe strong on ultrasonics or  
5                   something.  Is there such a user need letter or any --

6                   VICE CHAIRMAN SHACK:  Well, there is  
7                   something from Oak Ridge now.

8                   MR. GILLESPIE:  Actually, there is a  
9                   letter report that just recently got put in ADAM from  
10                  Oak Ridge, from a project that Research sponsored, but  
11                  it is not commercially available yet.  And, as best I  
12                  understand it, it is a technique to calibrate for this  
13                  concrete steel concrete sandwich.

14                  I think, as I understand it, there are  
15                  three different alternative approaches to doing it.  
16                  And so the information is starting to be developed and  
17                  published.  But we're probably years away from actual  
18                  commercial application to go from the research bench  
19                  to the --

20                  MEMBER KRESS:  Yes, but you have got years  
21                  to go to do it in.  I mean, the corrosion rate is low  
22                  enough that --

23                  MR. GILLESPIE:  I am not disagreeing.  If  
24                  the Committee would like to -- we think we're actually  
25                  pretty close right now on a plant-by-plant basis.  But

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1 if the Committee would like to write a letter  
2 recommending a research project, it's okay. I don't  
3 mind. It's your Committee.

4 MEMBER SIEBER: The question is what do  
5 you want to cut out to pay for it.

6 MEMBER MAYNARD: I would like to just add  
7 on to Tom's previous comment just a little bit. It  
8 doesn't surprise me. And I would expect the industry  
9 to resist new requirements, new changes to things. I  
10 think it better to get the fight over, have it once,  
11 rather than a lot of times.

12 So, rather than dealing with a lot of  
13 things through staff guidance, generic letters, a lot  
14 of times it would be better if this is going to be a  
15 new expectation, new requirement, let's follow the  
16 process and make that -- you know, get the fight over  
17 with once, make it happen, rather than continually  
18 trying to go around these systems just generically.

19 MEMBER SIEBER: The requirement has always  
20 been there. And it stems from the code requirement.  
21 The question is, what do you do and how do you do it  
22 to give yourself a reasonable assurance that you're  
23 okay.

24 MR. GILLESPIE: The new aspect now is  
25 people having to articulate in an aging management

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1 program what they're going to do to ensure that their  
2 monitoring and measurement process for this liner will  
3 detect its approach to minimum wall thickness prior to  
4 it getting there.

5 I mean, that's really what plant license  
6 renewal is, to ensure that you have the additional  
7 monitoring programs in place that you will detect and  
8 correct prior to exceeding that minimum wall  
9 thickness.

10 The discussion of this ISG between us and  
11 the industry is evoked. I think it has now gotten us  
12 to a point where we have some actual cases under our  
13 belt that have now, you might say, set the standard  
14 for the next ones to come in.

15 And now we've got each plant evaluating  
16 itself against the plants we have already looked at  
17 and saying, "Am I like them? Am I different? If I'm  
18 different, then is it a positive difference or  
19 negative difference?"

20 And now we're starting to get those kind  
21 of aging management considerations into this piece of  
22 equipment, which we did not have, quite honestly,  
23 going in until we hit Browns Ferry.

24 The Committee wants -- Mario will remember  
25 this. I forget which BWR they were in. It was on the

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1 steam dryers. And I used the Committee. I quoted the  
2 Committee to the staff on the liner. And it was on  
3 the dryers.

4 And, Mario, I forget. You might have been  
5 the one who said it. You said it's large, it's  
6 passive, and you just wrote a generic letter saying  
7 it's safety. It wasn't in scope before that statement  
8 was made. It's now in scope. And, you know, the  
9 staff said it's large, it's passive, it has corrosion,  
10 and it's safety. And so now we're trying to take it  
11 on head on. I think with some success, you're seeing  
12 the applications getting it addressed at some level of  
13 credibility now.

14 MR. THADANI: Graham, I have one quick  
15 question.

16 Frank, you noted this is a high-dose area.  
17 This issue is one important in many ways, has I think  
18 rather minimal risk to public. How is that sort of  
19 balanced in terms of the actions called for and its  
20 relative importance?

21 MR. GILLESPIE: I think how we are trying  
22 to deal with that -- and we have got a meeting with  
23 one applicant day after tomorrow, Oyster Creek, on  
24 this, on our residual concerns after their RAIs. And,  
25 really, what we started talking about was the

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1       uncertainties involved in the decision.

2                   And so the question really is, how much  
3       should you pay for certainty in a decision? Because  
4       the significant measurement uncertainty and doing  
5       these UT exams, they're actually fairly coarse.

6                   There is uncertainty in primers and  
7       liners, which have exceeded, basically, the  
8       manufacturer-recommended lives of 10 to 15 years.  
9       Yet, they're still there. And they're still being  
10      inspected doing what they're doing.

11                  There is uncertainty in have you picked  
12      enough selected locations because we are looking for  
13      a general area degradation. We're not looking for  
14      just pitting.

15                  The Committee didn't mention it, but there  
16      are really two concerns. One is pressure retention  
17      and accident. And the other is buckling, the sheer  
18      collapsing of this thing under its own weight. And so  
19      you've got two reasons to inspect two different areas.

20                  And so I would suggest that in this ISG  
21      and what we're seeing from these utilities, we're  
22      actually accepting, you might say, a fair level of  
23      uncertainty in it to keep it rational.

24                  And so the safety consideration is in how  
25      much do we want to press people to make it more and

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1 more certain. And so that's really how we're  
2 factoring in the safety significance of it.

3 When I talk about dose and how many  
4 measurements need to be taken, we need reasonable  
5 assurance. And in many cases, there's not positive  
6 evidence on either side because this is a large  
7 passive thing that was put in there. It's expected to  
8 last forever fundamentally from the designer's point  
9 of view. We're confirming that assertion.

10 CHAIRMAN WALLIS: It probably will in most  
11 plants last.

12 MR. GILLESPIE: In most plants, I think it  
13 will. And so it's a confirmation. And so we're not  
14 designing the plant, which is very vigorous. We're  
15 confirming that the expected performance will be  
16 sustained. And we probably can be slightly less  
17 rigorous in the uncertainty we accept on that.

18 CHAIRMAN WALLIS: That is all the agency  
19 ever does. It doesn't design plants.

20 MR. GILLESPIE: Right.

21 CHAIRMAN WALLIS: It confirms performance.

22 MR. GILLESPIE: But you learn how much,  
23 what you're going to do in that confirmation.

24 MEMBER BONACA: Yes.

25 CHAIRMAN WALLIS: I think we may have gone

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1 over. We have gone over 15 minutes. I think it's  
2 about time we --

3 MEMBER BONACA: One last comment I had was  
4 that, you know, so many of the -- however the  
5 inspection processes we still depend on, for example,  
6 the visual inspection of this, we are still at the  
7 pace that really was conceived at the moment these  
8 plants are put in renewal. Okay? So every ten years  
9 they go in and look at it. Okay?

10 To me, you know, as these plants get older  
11 and older, these inaccessible areas, et cetera, you  
12 know, then maybe the frequency with which we're  
13 looking at it becomes more questionable because, you  
14 know, every ten years, a lot of things can happen.

15 CHAIRMAN WALLIS: Especially when you  
16 start to find things.

17 MR. GILLESPIE: We have occasions in  
18 several licensees where because they were sticking to  
19 a more extended inspection period, even when they had  
20 evidence of water, they did not consider evidence of  
21 water equivalent to accelerated corrosion visually.

22 So this ISG actually tries to take the  
23 principle you just espoused and says, "You can no  
24 longer in our expectation, staff's expectation, you  
25 can no longer ignore the presence of water. You have

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1 to now give us positive confirmation that the rate of  
2 degradation is still being minimized.

3 CHAIRMAN WALLIS: It is not boric acid.

4 MR. GILLESPIE: Yes, yes. At least we're  
5 dealing with a general moisture.

6 CHAIRMAN WALLIS: Right.

7 MR. GILLESPIE: And so this actually does  
8 go for that extended period to some incidents in which  
9 we actually have evidence from various licensees.  
10 They had evidence of water and basically did an  
11 engineering evaluation and did not obtain positive  
12 information if the thickness was okay.

13 MEMBER BONACA: What are you going to do  
14 when one of the already approved license renewals is  
15 going to come in for another license renewal?

16 MR. GILLESPIE: They have talked to us  
17 about that.

18 MEMBER BONACA: Well.

19 MR. GILLESPIE: I'm hoping to be retired  
20 by that point.

21 MEMBER BONACA: Anyway, I think we will  
22 see how this works.

23 MR. GILLESPIE: I started with the draft  
24 of the renewal rule in 1989 and have been doing this  
25 now for the last five years. At some point, someone

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1 else should do it.

2 MEMBER BONACA: All right.

3 MR. GILLESPIE: Thank you.

4 MEMBER BONACA: I give you back the  
5 meeting, Mr. Chairman.

6 CHAIRMAN WALLIS: We are ready to come off  
7 the record. Thank you very much for recording the  
8 meeting today, and we will take a break until a  
9 quarter to 5:00.

10 And when we come back, we will finish  
11 Mario's letter, which seems to be fairly  
12 straightforward. And then we will know where we are  
13 going with the other letter, hopefully know well  
14 enough that we can see our way to the end of it  
15 tomorrow.

16 (Whereupon, the foregoing matter was  
17 concluded at 4:34 p.m.)

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# Official Transcript of Proceedings

## NUCLEAR REGULATORY COMMISSION

Title: Advisory Committee on Reactor Safeguards  
533rd Meeting

Docket Number: (not applicable)

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS (ACRS)

533rd MEETING

+ + + + +

WEDNESDAY, MAY 31, 2006

+ + + + +

ROCKVILLE, MARYLAND

+ + + + +

The Subcommittee met in Room T2B1 at Two White Flint North, 11555 Rockville Pike, Rockville, Maryland, at 8:30 a.m., Graham B. Wallis, Subcommittee Chair, presiding.

MEMBERS PRESENT:

- GRAHAM B. WALLIS Chairman
- WILLIAM J. SHACK Vice Chairman
- GEORGE E. APOSTOLAKIS Member
- J. SAM ARMIJO Member
- MARIO V. BONACA Member
- RICHARD S. DENNING Member
- THOMAS S. KRESS Member
- OTTO L. MAYNARD Member
- JOHN D. SIEBER ACRS Member-At-Large
- JOHN LARKINS Designated Federal Official

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1       ACRS STAFF PRESENT:

2       HANS ASHAR                    NRR

3       DANIEL FRUMKIN                NRR

4       ALEX KLEIN                     NRR

5       THOMAS KOSHY                 EEEEB/DE/NRR

6       MICHAEL MAYFIELD             DE/NRR

7       GEORGE MORRIS                EEBE/DE/NRR

8       LINH TRANS                    NRR

9       GEORGE WILSON                NRR

10      ROBERT WOLFGANG             NRR

11      ROY WOODS                     RES

12

13      ALSO PRESENT:

14      HAROLD BARRETT               Duke Power Company

15      MIKE FALLON                   Constellation Energy

16      ALEX MARRION                 NEI

17      DAVID MISKIEWICZ             Progress Energy

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AGENDA ITEMS

PAGE

Opening Remarks, Chairman Graham B. Wallis . . . 4

Draft Final Generic Letter, "Post-Fire  
Safe-Shutdown Circuit Analysis  
Spurious Actuations" . . . . . 5

Draft Final Generic Letter 2006-XX,  
"Inaccessible or Underground Cable  
Failures that Disable Accident  
Mitigation Systems" . . . . . 149

Interim Staff Guidance on Aging Management  
Program for Inaccessible Areas of Boiling  
Water Reactor (BWR) Mark I Containment  
Drywall Shell . . . . . 195

Adjournment

## P R O C E E D I N G S

(8:31 a.m.)

CHAIRMAN WALLIS: The meeting will now come to order.

This is the first day of the 533rd meeting of the Advisory Committee on Reactor Safeguards. During today's meeting, the Committee will consider the following:

Draft Final Generic Letter, Post-Fire Safe-Shutdown Circuit Analysis Spurious Actuations, Draft Final General Letter, Inaccessible or Underground Cable Failures that Disable Accident Mitigation Systems, Interim Staff Guidance on Aging Management Program for Inaccessible Areas of Boiling Water Reactor Mark I Containment Drywell Shell, and Preparation of ACRS reports.

This meeting is being conducted in accordance with the provisions of the Federal Advisory Committee Act. Dr. John T. Larkins is the Designated Federal Official for the initial portion of the meeting.

We have received no written comments from members of the public regarding today's sessions. We have received a request from Alex Marrion, NEI, for time to make oral statements regarding the Generic

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1 Letter on Post-Fire Safe-Shutdown Circuit Analysis and  
2 the Generic Letter on Inaccessible or Underground  
3 Cable Failures that Disable Accident Mitigation  
4 Systems.

5 A transcript of portions of the meeting is  
6 being kept and it is requested that the speakers use  
7 one of the microphones, identify themselves, and speak  
8 with sufficient clarity and volume so that they can be  
9 readily heard.

10 I will begin with some items of current  
11 interest. In the items handed out to you, I notice  
12 that there is a speech by Commissioner Yatzko at the  
13 beginning. And at the end, there is an interesting  
14 article on various matters which complicate PWR sump  
15 evaluations.

16 Now in the middle of the day, we are going  
17 to have ethics training which is why the lunch break  
18 is so long today. And the ethics training is  
19 scheduled for between 12:15 and 1:30 so you should be  
20 here at 12:15 and ready to be trained in ethics.

21 That is the end of my prepared remarks.  
22 And I'd like to proceed with the meeting. Call on  
23 Rich Denning to get us started on the first item.

24 MEMBER DENNING: Thank you. We will be  
25 hearing from the staff regarding the draft final

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1 generic letter 2006-XX, Post-Fire Safety-Shutdown  
2 Circuit Analysis Spurious Actuations. The Committee  
3 will hear presentations by and hold discussion with  
4 representatives of the staff.

5 Additionally, Mr. Alex Marrion with NEI,  
6 has requested ten minutes to share NEI's perspective  
7 after the staff's presentation.

8 The Committee had requested to review the  
9 generic letter regarding Post-Fire Safe-Shutdown  
10 Circuit Analysis Spurious Actuations after the public  
11 comment period. We did not have a prior subcommittee  
12 meeting on this letter which may have been a mistake.

13 I have serious reservations about the  
14 balance between regulatory burden and approved safety  
15 associated with this letter. The letter leaves open  
16 options for risk informing this process but they are  
17 not easy activities to perform. So we are anxious to  
18 hear what the staff has to say on this. And to have  
19 a healthy discussion, I believe.

20 We have a considerable period of time  
21 actually to do this, three hours. But I think that we  
22 will want to look into this letter very carefully  
23 before giving our blessing.

24 I think we are now ready to hear from  
25 staff. And I'll turn it over to Alex Klein of the

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1 Office of Nuclear Reactor Regulation.

2 MR. KLEIN: Thank you very much. My name  
3 is Alex Klein. You see on the cover slide here my  
4 branch chief's name, Sunil Weekakkody. He extends his  
5 regrets for not being able to attend today's meeting  
6 in that he had a prior commitment for jury duty today.  
7 With that, I'm acting in his place so I will give the  
8 opening presentation.

9 The purpose of today's meeting and the  
10 presentation to the Committee is to present the final  
11 draft of Generic Letter 2006-XX, Post-Fire Safe-  
12 Shutdown Circuit Analysis Spurious Actuations. We are  
13 also here to obtain ACRS endorsement to issue the  
14 proposed generic letter.

15 I'd like to introduce the two primary  
16 staff members who will present today for NRR. To my  
17 left is Robert Wolfgang who is the primary author of  
18 the generic letter. And to my right is Daniel  
19 Frumkin, fire protection engineer, from the Office of  
20 NRR, who will speak to you about some of the NEI and  
21 EPRI fire testing.

22 We also have in the audience with us  
23 supporting staff members from NRR who were also  
24 instrumental in the development of this generic  
25 letter.

1           As an overview, I wanted to advise the  
2           Committee that there is a lot of history leading up to  
3           this generic letter. And you will hear some of this  
4           today. We did a bounding analysis, full of risk. We  
5           also did a regulatory analysis of the generic letter.  
6           But at this time, those slides are not in our  
7           presentation. But we are certainly prepared to  
8           discuss those aspects.

9           MEMBER DENNING: We absolutely would like  
10          to see those slides.

11          MR. KLEIN: Very good.

12          So the probability of spurious actuations  
13          due to fires will be presented by Dan Frumkin after I  
14          speak. And then after Dan speaks, we will receive a  
15          summary of the objectives of the generic letter by Bob  
16          Wolfgang.

17          Again, based upon the long history of this  
18          generic letter and so forth, there has been differing  
19          views between the industry and the NRC on the  
20          credibility of multiple spurious actuations. You will  
21          hear about the NEI/EPRI cable fire test results from  
22          Dan Frumkin, as I indicated.

23          I also wanted to indicate to the Committee  
24          that we are continuing with our inspections using  
25          risk-informed aspects. For example, RIS 2004-03,

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1 certainly one of the goals of issuing this generic  
2 letter is to reestablish compliance with the  
3 regulations.

4 That concludes my introductory remarks.  
5 And I'll hand over the presentation to Dan Frumkin.

6 CHAIRMAN WALLIS: When you present, could  
7 you make it clear to me just what it is you are asking  
8 industry to do because I had a lot of trouble figuring  
9 that out. There is a lot of sort of rather vague  
10 requirements it seems to me. And perhaps you can in  
11 your presentation make it clear just what it is they  
12 have to do.

13 MR. KLEIN: Yes.

14 MR. FRUMKIN: Good morning. My name is  
15 Dan Frumkin from the Office of NRR. I work for Sunil.  
16 And today I'm going to present some of the background  
17 from the NEI/EPRI testing that is discussed in the  
18 generic letter.

19 I see some new faces around the ACRS table  
20 so I'm going to pass around some tables from some  
21 testing that occurred. At the end of the cables that  
22 are fused together, you will be able to see two  
23 failure modes or examples of two failure modes. One  
24 is an inter-cable which is two cables -- or actually  
25 one is an intra-cable, which we use these terms intra

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1 within a single cable and inter between two separate  
2 cables. And this provides an example of both.

3 The highlighted portions within a cable  
4 are very close together that have failed together.  
5 And then we also have intruding cable that has  
6 penetrated the outer jacket and apparently the inner  
7 cable protection and come at least into very close  
8 contact which you can see.

9 We will talk also about the different  
10 types of cable. This is a thermal plastic cable,  
11 which is the more vulnerable cable, but as you can  
12 see, that it is subject to both failures from internal  
13 and external cables when put under the suitable heat  
14 or fire exposure.

15 So I'll be providing some background on  
16 the testing that provided the insight into the failure  
17 likelihoods, the objectives of that testing, some  
18 details of the testing, some of the test results, and  
19 a few conclusions based on the testing.

20 And then Mr. Wolfgang will be talking  
21 about the generic letter more specifically.

22 The NEI/EPRI testing was intended to  
23 address fire-induced circuit failure issues of concern  
24 to the NRC staff, principally the potential for  
25 spurious operations of equipment.

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1           This was intended to basically bring to  
2 close the question that the staff kept on bringing up  
3 that Browns Ferry had these and the industry said that  
4 well, it is very unlikely to occur. So this was  
5 intended to bring that to a close.

6           NRC witnessed the testing and also did  
7 some insulation resistant testing using Sandia  
8 National Laboratory resources.

9           And there are four documents that either  
10 in whole or in part document the results of some of  
11 the testing. The characterization of fire-induced  
12 circuit failures results is the big report from EPRI.

13           The circuit analysis failure modes and  
14 likelihood analysis is the Sandia Report of their  
15 insulation resistant testing.

16           These results were pulled into the NUREG  
17 6850, which is the fire protection re-quantification  
18 or the fire PRA methodology for nuclear power  
19 facilities. This is the state-of-the-art document  
20 that Research has developed to -- it is a handbook on  
21 how to do fire PRA.

22           And then there was the spurious actuation  
23 expert elicitation which was experts reviewing the  
24 testing and coming up with results.

25           The objectives, as I said, was to research

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1 the characteristics of fire-induced circuit failures  
2 to better understand these plants' responses to cable  
3 failures. And, as I said, the NRC also was involved  
4 in the testing and reviewed -- witnessed the testing  
5 and did their own insulation resistant testing.

6 So the details of the test, there were 18  
7 fire tests that were conducted between January 9th,  
8 2001 and June 1st, 2001 at the Omega Point  
9 Laboratories in San Antonio. And the three types of  
10 fire exposures were tested during the test. The hot  
11 gas layer region which is up at the ceiling level, the  
12 fire creates a buoyant plume and it fills the  
13 enclosure from the top down. And that is the hot gas  
14 layer.

15 Then below -- between the fire -- the  
16 actual fire and the hot gas layer is what we call the  
17 plume region where there is no flaming but that is a  
18 very hot part of the -- that is the hottest part of  
19 the smoke region of the fire.

20 And they also tested a radiant exposure  
21 where you get close to the fire itself or sometimes  
22 worst case could be up next to the plume region  
23 depending on emissivity of the smoke and the radiant  
24 energy coming off. If it is a clean burning flame, it  
25 may not have a high radiant energy but the smoke may

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1 be higher. So -- but they just used, I believe, a  
2 fixed radiant number but that is a little discussion  
3 of the radiant energy.

4 One thing that they didn't do that I will  
5 add is they did not put cables in the flaming region.  
6 That is why I have this highlighted. We, the staff,  
7 hear a lot from the licensees about how long it takes  
8 to have these cables fail. And that there is plenty  
9 of time in all situations for mitigation.

10 And based on the testing, yes, in a lot of  
11 the testing there was a lot of time before there was  
12 failure in, you know, 30, 40 minutes for some of the  
13 tests. But none of the tests tested this flaming  
14 region.

15 So this leaves the staff a very strong  
16 question of how fast -- well, first we don't know what  
17 failures will occur in that region. They could occur.  
18 They may not occur. We don't have the information.

19 It is very clear that if they do occur,  
20 they will occur much more quickly. The temperatures  
21 are over, you know, much -- a thousand degrees hotter  
22 in the flaming region. And there is also an ignition  
23 source. So it is a very different phenomenon. And  
24 cables could be exposed to a flaming region in the  
25 plant.

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1           So this test is not a complete picture of  
2           -- or let me just say that the timing factors that  
3           came out of the testing that was done are not a  
4           complete picture of the possible scenarios that could  
5           occur.

6           MEMBER APOSTOLAKIS: It appears that you  
7           were participating in the conduct of these tests. Did  
8           you express these concerns to EPRI when they were  
9           designing the tests?

10          MR. FRUMKIN: Well, I wasn't specifically  
11          involved in that. I don't believe that the test was  
12          intended to develop timing. And as such, it wouldn't  
13          have been an issue. The licensees or the industry has  
14          brought this timing issue and perhaps inappropriately  
15          based on the testing.

16          It is useful to heat this cable slowly  
17          because then the hot shorts would probably exist for  
18          a longer period of time. But whether this -- but my  
19          only point is that I don't believe that this testing  
20          provides a basis to say that hot shorts -- this test  
21          I don't think was intended or can provide a basis for  
22          timing. But I believe it is being applied or some  
23          intend to use it to show that there is a timing issue.

24          MEMBER APOSTOLAKIS: I would be such an  
25          obvious thing to do. I mean there must be a reason

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1 why they didn't do it. Do you know that? Or should  
2 we ask Mr. Marrion when he comes?

3 MR. FRUMKIN: Why they didn't do the  
4 flaming region? Yes, that is a fair question. But I  
5 believe the answer -- like I said, I do think that  
6 that was not -- if there hadn't been any failures  
7 outside of flaming region, I think there would have  
8 been a strong feeling that failures in the flaming  
9 region would have been maybe less likely. But it is  
10 a fair question.

11 MEMBER APOSTOLAKIS: Okay.

12 CHAIRMAN WALLIS: Does the material from  
13 which the insulation is made, does that actually burn  
14 at some temperature?

15 MR. FRUMKIN: Yes.

16 CHAIRMAN WALLIS: But if you stuck it in  
17 a flame, you would expect the insulation itself to  
18 catch fire.

19 MR. FRUMKIN: Yes. The ASTM -- or, I'm  
20 sorry, the IEEE 383 fire test that has been the  
21 standard fire test is actually a burning test. And it  
22 ignites the flames from the bottom in a vertical cable  
23 tray. And all the cables do catch on fire when  
24 exposed to flame. But some of them propagate more or  
25 less slowly.

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1           There are some specialized cables that  
2 don't catch on fire but those were not tested. Those  
3 aren't what we are talking about here.

4           So the results of the tests showed with  
5 some confidence that failures within multi-conductor  
6 cables are likely and when they do occur, they occur  
7 in multiple conductors within the same multiple  
8 conductor cable. So as you can see from that cable  
9 bundle, there may actually be more than one cable  
10 conductor within the cable further down the jacket  
11 that you can't see.

12           And then the way they are spiraled  
13 together in there so that various cables could come in  
14 contact with other cables within the same cable.  
15 Various conductors could come into contact with other  
16 conductors within the same cable.

17           In addition, multiple devices were shown  
18 -- the spurious actuation data showed that a single  
19 hot short within a multi-conductor cable usually  
20 effected actuation devices simultaneously. If there  
21 were two devices -- I believe the way they set this  
22 test up is they wanted a very practical approach.

23           So they actually put -- rather than doing  
24 similar to the Sandia testing where they used an  
25 insulation-resistance device, they used actual plant

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1 equipment, which they just plugged it in as they would  
2 in the plant and if it would actuate or not actuate.  
3 So it was a real pragmatic thing and they did actuate.  
4 And as the testing showed, some actuated  
5 simultaneously.

6 MEMBER MAYNARD: Did they also measure how  
7 long the signal stayed there? Or how long it  
8 actuated?

9 MR. FRUMKIN: Yes. And most of the hot  
10 shorts were of a short duration. And some were in the  
11 order of minutes, I believe.

12 This is a table of results of the best  
13 estimates given cable damage of a spurious actuation  
14 probability. And the purpose of this table is not to  
15 -- the purpose of this table is just to show that the  
16 NRC and the industry -- or at least the results from  
17 the EPRI report which was developed by industry, are  
18 very consistent.

19 The staff and the risk people in industry  
20 really are on the same page with the likelihood of  
21 spurious actuations. There are some factors of two  
22 here, differences, but in probabilistic and  
23 likelihoods, in that world it is a small difference.

24 CHAIRMAN WALLIS: This is strange to me.  
25 It must depend on the extent of the damage. I mean if

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1 you just burn a cable for a short time, nothing  
2 happens. If you burn it for long enough, you are  
3 going to get shorts. So you can't just have a  
4 probability. It is going to depend on the extent of  
5 the damage to the cable.

6 MR. FRUMKIN: Yes. In all these, cables  
7 were exposed to damage. So this is given that these  
8 cables were damaged.

9 CHAIRMAN WALLIS: But to what extent?

10 MEMBER APOSTOLAKIS: It is a critical  
11 probability. I mean -- or, as you said earlier --

12 PARTICIPANT: At some point the  
13 probability is one, right?

14 MEMBER APOSTOLAKIS: I mean there is a 0.6  
15 conditional probability that you will have a spurious  
16 actuation. This is conditional on the probability  
17 that the cable is damaged.

18 MR. FRUMKIN: Correct.

19 MEMBER APOSTOLAKIS: And what is that?

20 MR. FRUMKIN: That depends on the  
21 scenario. For example, if a cable is a foot above a  
22 piece of switch gear or let's say -- and this is not  
23 an unlikely situation -- a foot above 20 or 30 feet of  
24 switchgear. It runs across the cable tray, across the  
25 top of a number of pieces of switchgear, what is the

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1 probability?

2 Well, that could be calculated typically,  
3 I think, a single piece of switchgear is five times E  
4 to the minus five. Or, you know, in that range. But  
5 then it certainly would be damaged if there was even  
6 a small fire in that piece of switchgear.

7 So there is -- you could have cable -- and  
8 then that same cable does go through different areas  
9 where it could be exposed to different other fires.  
10 A single cable could go through three, four, five  
11 different areas and be exposed to a dozen different  
12 fire scenarios.

13 MEMBER DENNING: I think we have to  
14 recognize the context within which this is done,  
15 George. And I think it is important when we try to  
16 get into the question of risk informing this and that  
17 is basically we are doing a deterministic safe  
18 shutdown analysis in which you assume there is a fire  
19 in a zone -- in a fire area. And it can burn there  
20 for three hours. You know even though there are other  
21 mitigating things that would clear that, we assume it  
22 can burn for three hours.

23 So then the question is well, with this  
24 massive potential exposure, then you have got a cable  
25 running through there. What's the potential that it

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1 could then be heated up to a point at which you get  
2 this kind of interaction? You know it doesn't get at  
3 all into the questions of you have a fire in a room,  
4 what is the possibility that any cables are exposed,  
5 you know, before it is controlled.

6 MEMBER APOSTOLAKIS: But if we are doing  
7 a deterministic analysis, why are we calculated  
8 spurious actuation probabilities?

9 MEMBER DENNING: Well, let me give my view  
10 but I'd certainly like to hear your view, and that is  
11 that the question is not so much whether you can have  
12 spurious actuations but how many can you have? How  
13 many combinations of things can you deal with?

14 The industry has always agreed to looking  
15 at a spurious actuation on a one-at-a-time basis, you  
16 know. And so I think that what the staff is trying to  
17 do is to give the feeling that -- or their impression  
18 that this isn't the really rare event -- the extremely  
19 rare event that actually would have some kind of  
20 spurious actuation occurring.

21 And then I think by implication then maybe  
22 there is the potential for multiple spurious  
23 activations.

24 MEMBER APOSTOLAKIS: Well, the second  
25 bullet of the previous slide, I guess, is then the

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1 key, right? Is that what -- of devices?

2 MEMBER DENNING: Well, I would be curious.  
3 What is your -- if you were answering that question,  
4 how would you have answered George's question? Why  
5 are we looking at probabilities here now?

6 MR. FRUMKIN: Well, okay, maybe this slide  
7 was poorly planned. But the point of the slide is  
8 twofold. One is to say that with regard to  
9 probabilities, the staff and the industry people who  
10 do this work are on the same page.

11 And the second reason, I guess, is to show  
12 that these probabilities are very high in  
13 probabilistic space, that some of them are close --  
14 you know, 0.6, and then if you have a 0.6 scenario and  
15 you have two 0.6 scenarios, you've got a 0.36  
16 scenario. So that even multiple can be a fairly high  
17 probable.

18 MEMBER DENNING: Now help us though -- you  
19 can't say that without giving some conditionality of  
20 --

21 MR. FRUMKIN: Right.

22 MEMBER DENNING: -- 0.6 conditions on  
23 what?

24 MR. FRUMKIN: Cable damage.

25 MEMBER DENNING: Cable damage.

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1                   MEMBER ARMIJO: I have a problem with  
2 cable damage. Is this severe? Moderate? I have no  
3 feeling of -- I can see where all the insulation is  
4 burnt to a crisp and I would call that severe.  
5 Wouldn't these probabilities all be one?

6                   MR. FRUMKIN: No. Well, okay, so what  
7 this is talking about is the spurious actuation  
8 probability, not shorting situation. This is the  
9 likelihood of a hot short occurring within a cable  
10 without that cable shorting to its conduit or cable  
11 tray because generally once the hot conductors fail to  
12 the conduit or cable tray or the nearest ground, then  
13 they would certainly -- that would clear the spurious  
14 actuation.

15                  MEMBER MAYNARD: Okay. But I think there  
16 is a high probability if you make all the assumptions  
17 to get to this point. But you also have to factor in  
18 the probability of actually having a fire, for the  
19 fire going that long, for the operators not taking any  
20 action. There are a lot of other things getting up to  
21 that point that when you put it all in context --

22                  MEMBER APOSTOLAKIS: That is why I'm  
23 confused. We are either doing deterministic analysis  
24 or we are doing risk analysis. If we do risk  
25 analysis, then, of course, we have to do all this. If

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1 we do what Rich said, then it seems to me they are  
2 gone.

3 I mean you have three hours. Everybody is  
4 burning, right? I think as I recall from the early  
5 studies on this the real question is whether you will  
6 have a short -- a hot short first before an open  
7 circuit.

8 MR. FRUMKIN: Right. Before the short  
9 ground.

10 MEMBER APOSTOLAKIS: That is the critical  
11 thing.

12 MR. FRUMKIN: Yes.

13 MEMBER APOSTOLAKIS: And this is not  
14 answering that, is it?

15 MR. FRUMKIN: Yes, it is.

16 MEMBER APOSTOLAKIS: It is?

17 MR. FRUMKIN: This is the likelihood of  
18 that spurious actuation probability, not a short to  
19 ground.

20 MEMBER APOSTOLAKIS: Okay.

21 CHAIRMAN WALLIS: This is one spurious  
22 actuation.

23 MR. FRUMKIN: This is a single.

24 CHAIRMAN WALLIS: A single one although  
25 there are multiple wires in the cable?

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1 MR. FRUMKIN: Right. Well, this is a  
2 spurious actuation getting cable to damage within a  
3 cable or between -- there is an inter-cable factors  
4 here -- between two cables. So the point -- let's  
5 just say the 0.6 here is for within a single thermoset  
6 cable, the 0.2 or the 0.4, as the 6850 has it, is  
7 between -- or generally it is 0.3 is what has been  
8 used a lot -- is between two separate thermoset cables  
9 within the same tray.

10 And what the previous slide was trying to  
11 say is that within a single thermoset -- within a  
12 single multi-conductor cable, that more than one of  
13 the conductors are going to fail together with an 80  
14 percent likelihood. So it almost for sure that if  
15 let's say you have one hot conductor and four control  
16 conductors that could actuate four different pieces of  
17 equipment, that hot conductor will come into contact  
18 probably with all of them with the same likelihood,  
19 with this same 0.6.

20 CHAIRMAN WALLIS: Oh, with the same  
21 likelihood?

22 MR. FRUMKIN: Yes. It's not a 0.6 times  
23 0.6 times 0.6 in the same cable. Within that cable it  
24 is 0.6 times 0.8, if you will.

25 CHAIRMAN WALLIS: Okay.

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1 MR. FRUMKIN: So it is still -- it is  
2 almost 0.6.

3 MEMBER DENNING: Why are the inter-cable  
4 probabilities the same for thermal plastic and  
5 thermoset?

6 MR. FRUMKIN: Because -- oh, you mean this  
7 and this?

8 MEMBER DENNING: Yes.

9 MR. FRUMKIN: Inter-cable -- yes, I'm not  
10 -- that's just a -- well, intra-cable is very likely  
11 --

12 MEMBER DENNING: Intra-cable, I understand  
13 that.

14 MR. FRUMKIN: Yes, I don't -- I don't have  
15 --

16 CHAIRMAN WALLIS: What is the question,  
17 Rich?

18 MEMBER DENNING: It's thermoset is less  
19 likely -- one would think thermoset would be less  
20 likely to have inter-cable and perhaps they are the  
21 same here because there just haven't been any  
22 experiments done on a thermoset.

23 MR. FRUMKIN: I think that is it because  
24 you can see that that is one of the big differences,  
25 a factor of two here, and again the same factor of two

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1 for intra-cable -- inter-cable -- but yes, we're -- as  
2 Roy Woods is here, and we're doing more testing on  
3 this. But this is currently the state-of-the-art data  
4 on this.

5 And I can't explain the -- it's just that  
6 is what the data showed from the limited 18 tests.

7 CHAIRMAN WALLIS: Now we are talking about  
8 whether you are doing probabilistic or deterministic  
9 analysis. When we get to the generic letter, there  
10 are strange terms such as saying the licensee must  
11 assume the possibility of simultaneous multiple  
12 spurious actuation -- well that tells me nothing.

13 I'm assuming the possibility -- it says  
14 nothing about whether it is likely to be one or 0.6 or  
15 whatever.

16 MEMBER DENNING: What they are saying is  
17 one.

18 CHAIRMAN WALLIS: What does it mean?

19 MEMBER DENNING: It means one.

20 CHAIRMAN WALLIS: So possibility means a  
21 probability of one?

22 MEMBER DENNING: That's -- yes.

23 CHAIRMAN WALLIS: That wasn't clear to me  
24 at all. Okay.

25 MEMBER APOSTOLAKIS: We will come to the

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1 letter, I guess.

2 MEMBER DENNING: Yes. Continue.

3 MR. FRUMKIN: These are just some notes on  
4 the previous slide that some of the plants that use  
5 the CPTs, which are the control power transformers,  
6 that reduces the likelihood of spurious actuations.

7 MEMBER APOSTOLAKIS: All of these  
8 probabilities, of course, mean nothing now.

9 MR. FRUMKIN: Right, yes.

10 MEMBER APOSTOLAKIS: They are one.

11 MR. FRUMKIN: Okay. Well --

12 MEMBER DENNING: But we are going to get  
13 to risk informing at some point here.

14 MR. FRUMKIN: Absolutely. Right. So  
15 those were just notes on the previous slide which was  
16 unfortunately put in here.

17 In conclusion, a review of the test data  
18 readily illustrates that hot shorts often involve more  
19 than one conductor. And that concurrent hot shorts  
20 within a cable are probable and should be considered  
21 during circuit analysis.

22 That's the end of this presentation. And  
23 the point of this is just to lay the groundwork that  
24 simultaneous spurious actuations and simultaneous  
25 multiple spurious actuations have been shown by

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1 testing, by industry testing, to occur.

2 MEMBER DENNING: Now there is more testing  
3 that is in progress. It is your feeling that that  
4 testing could then -- will it be done within a time  
5 period where we add value to the licensee when the  
6 licensee is basically responding the generic letter?

7 MR. FRUMKIN: Yes, that testing is planned  
8 to be done by the end of the year. And that pool of  
9 data will be available -- certainly for risk-informed  
10 evaluations for the licensees to use. But the experts  
11 doing the testing don't believe that there is going to  
12 be -- they believe these numbers are going to be  
13 honed.

14 They believe that there are going to be  
15 more cable combinations tested here than in the 18  
16 EPRI tests -- EPRI/NEI tests. But they don't believe  
17 that for the information that was on that table are  
18 going to be changed by an order of magnitude. It's  
19 maybe a 50 percent change or something of that nature.

20 MEMBER DENNING: If we have time later on,  
21 could we have a short presentation by someone about  
22 what is still to happen? And what different  
23 configurations basically have been untested at this  
24 point that will be tested?

25 MR. FRUMKIN: Well, Roy Woods is sitting

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1 behind you. And I'm not sure if he is prepared to  
2 talk about this testing.

3 MEMBER DENNING: Let me say I'm not asking  
4 for you to do it right now. But do you think you  
5 could do it later?

6 MR. WOODS: Sure. Roy Woods, RES. Yes,  
7 certainly we can make a presentation to you whenever  
8 you want on the testing. The plans are well made. We  
9 are about to start within days or a week at most. It  
10 is actually about to happen.

11 MEMBER DENNING: Okay. Well, let's go  
12 ahead --

13 MR. FRUMKIN: I think they want something  
14 later this morning, right?

15 MEMBER DENNING: Yes, later this morning.  
16 Absolutely, yes. Later this morning.

17 MEMBER APOSTOLAKIS: That's what happens  
18 when you have three hours.

19 MEMBER DENNING: Right, yes. Thanks. Can  
20 you run any of those tests by eleven?

21 MR. WOLFGANG: My name is Bob Wolfgang.  
22 I'm a fire protection engineer in NRR. And I'm going  
23 to give you information on the draft generic letter  
24 Post-Fire Safe-Shutdown Circuit Analysis Spurious  
25 Actuations.

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1           A summary of the presentation, I'll go  
2 over the purpose of issuing the generic letter, the  
3 information we are requesting from licensees, the  
4 background on this issue since 1997, the basis for the  
5 generic letter, the issue that is clarified in the  
6 generic letter, public comments, and a summary at the  
7 end.

8           The purpose of issuing the generic letter  
9 is to clarify how the NEI/EPRI cable fire test program  
10 reaffirms long-held regulatory positions and provide  
11 part of a foundation for licensees who are planning to  
12 transition to NFPA 805.

13           Also, to respond to the Agency's need to  
14 provide clarification and closure of outstanding fire  
15 protection issues, respond to --

16           MEMBER APOSTOLAKIS: Excuse me. Are you  
17 going to come back to these? I mean this on slide 16,  
18 the foundation for licensees planning to transition,  
19 will you elaborate on these later? Or can you tell us  
20 a few words now?

21           MR. WOLFGANG: Well, that's --

22           MEMBER APOSTOLAKIS: Why is that relative  
23 to NFPA 805?

24           MR. WOLFGANG: This is just to show that  
25 multiple spurious actuations should be included in

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1 their risk analysis model.

2 MEMBER DENNING: Well, since George has  
3 raised the question, let me ask it now. And that is  
4 NFPA 805 is one of the ways -- transitioning to NFPA  
5 805 is one of the ways that a licensee can respond to  
6 this. Now my question is how long does it take to  
7 transition to NFPA 805?

8 And I don't quite understanding within the  
9 time periods of the 90 days and six months and this  
10 kind of stuff, within the context of a transition to  
11 NFPA 805, when did that transition actually have to  
12 occur for the licensee to be able to use that pathway?

13 MR. WOLFGANG: All they have to do is  
14 respond to us within I believe it is the 90 days.  
15 That they are transiting to NFPA 805. And they will  
16 take care of this situation during that process.

17 MEMBER DENNING: Then how long would they  
18 have to transition to NFPA 805?

19 MR. WOLFGANG: They have -- what is it?  
20 Is it three years?

21 PARTICIPANT: Three years.

22 MEMBER DENNING: Three years?

23 MEMBER APOSTOLAKIS: Yes, it is a long  
24 time.

25 MR. KLEIN: Let me describe briefly. This

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1 is Alex Klein. Let me briefly describe the process a  
2 licensee would use if he wants to transition to NFPA  
3 805. And that is once the licensee had made the  
4 determination that he does want to transition to 805  
5 because that is an option for him, if he submits a  
6 letter of intent to the agency indicating that that is  
7 what he wishes to do.

8 At that point, we review that letter and  
9 make a determination as to whether or not the schedule  
10 that the licensee has laid out is acceptable to the  
11 Agency. And what we have right now in place is a  
12 three-year time frame for licensees to transition with  
13 the option of extending that time frame if the  
14 licensee can provide us with sufficient justifications  
15 beyond the three-year time period.

16 Now within that three-year time period, a  
17 licensee would submit their letter of intend, do the  
18 act of transition into NFPA 805. And then before that  
19 three-year time period is over, we would submit their  
20 license amendment to the staff for our review and  
21 approval prior to them actually receiving the  
22 amendment.

23 MEMBER APOSTOLAKIS: It seems to me that  
24 the -- actually is the first bullet in the previous  
25 slide that is important because the licensee that

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1 wants to transition to NFPA 805 has to convince you,  
2 I think, that they complied with all the regulations,  
3 right? There may be a few exceptions, as I remember  
4 for a period of time, and all that.

5 So the primary reason seems to be to  
6 reaffirm long-held regulatory positions because  
7 somebody who wants to transition has to demonstrate  
8 that they complied with all that.

9 MR. KLEIN: That is correct. Really I  
10 think the primary purpose of the generic letter is  
11 that first bullet on that slide 16.

12 MEMBER APOSTOLAKIS: Right, right.

13 MR. KLEIN: Yes. As an added benefit, it  
14 does provide the foundation for licensees who want to  
15 transition to 805.

16 MEMBER DENNING: Now wait a second. I  
17 definitely did not understand this. I mean clearly  
18 there are a lot of licensees out there that did not --  
19 cannot respond to multiple spurious actuations. And  
20 they are not going to have to bring their plant into  
21 compliance with having to meet all the multiple  
22 spurious actuations before going to NFPA 805 because  
23 then NFPA 805 doesn't help them at all, right?

24 MR. FRUMKIN: Yes, that is correct. And  
25 what Dr. Apostolakis was saying is correct is that we

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1 have an enforcement discretion in place so those  
2 licensees who discover during transitions that they  
3 are not in compliance can do a risk analysis of that  
4 and determine that it is not red, that it is not  
5 wilful, that it is not a severity one violation.

6 And, therefore, they can comp it -- put  
7 compensatory actions in place and move forward towards  
8 transition without necessarily correcting that in  
9 accordance with the old fire protection program.

10 MEMBER DENNING: But one thing that I  
11 think is an issue though and that is suppose there is  
12 a plant out there that would really like to do the  
13 NFPA 805 approach but within the 90-day period, don't  
14 they have to go through the entire analysis and  
15 identify the SSCs that are potentially vulnerable  
16 based upon this detailed multiple spurious actuation  
17 evaluation which seems to me like an extremely  
18 difficult problem to undertake.

19 Is that true that they have to really  
20 analyze the whole system within 90 days according to  
21 this multiple spurious actuations and identify  
22 vulnerable SSCs? Am I correct or not correct?

23 MR. WOLFGANG: Well, they have to -- well,  
24 I'll get to that on a slide here.

25 MEMBER DENNING: Okay, if you will get to

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1 it, you can go ahead.

2 MEMBER MAYNARD: I would like to challenge  
3 that first statement just a little bit though. And I  
4 know that it has been a long-held position by members  
5 of the staff but as far as, you know, NRC position,  
6 there are a number of licenses that were issued and  
7 plants inspected and with their programs were approved  
8 and licensed without making this assumption.

9 And I'm not convinced that it has clearly  
10 been a recognized regulatory requirement. And again,  
11 I know licenses were issued, programs were reviewed  
12 without making -- otherwise, we wouldn't even be here  
13 today if those licenses weren't issued at that time.  
14 So I would challenge that. The first statement.

15 MR. WOLFGANG: We know SERs have been  
16 issued for Byron and Braidwood with a single spurious  
17 actuation per fire event. And we've come to the  
18 conclusion basically that was issued as a mistake.  
19 That was a mistake.

20 MEMBER MAYNARD: But I know that there are  
21 a lot of plants out there a license. Their analysis  
22 were reviewed, their programs were reviewed. I know  
23 I was personally involved with them back in the '80s  
24 when some of these issues were starting to come to a  
25 highlight. And I know that there are a number of

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1 plants out there with licenses that although it may  
2 not be documented as clearly, that it was known that  
3 multiple spurious actuations were not taken in account  
4 in that analysis.

5 I don't think it is clear that this is  
6 just confirming compliance to requirements that were  
7 in place. I think it is a different set of  
8 assumptions.

9 MR. FRUMKIN: Yes, and this may, I agree  
10 that your assumptions apply to probably a number of  
11 plants out there. But for the most part, Appendix R,  
12 10 CFR 50, Appendix R, Section 3(g)(ii) and 3(g)(ii)  
13 which is the alternate and dedicated shutdown are what  
14 is in question.

15 The NRC went in and did an analysis of the  
16 3(g)(iii) alternate shutdown. And for a lot of  
17 3(g)(iii) which is, for lack of a better description,  
18 a control room abandonment, they allowed the  
19 assumption of one spurious actuation. 3(g)(ii) wasn't  
20 across the board inspected in the 80s. It was assumed  
21 that licensees could wrap or protect or would have  
22 adequate separation.

23 And it wasn't evaluated for multiple  
24 spurious because generally the staff didn't believe  
25 that -- well, I'm not sure why they didn't do it. But

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1 the big question was this alternate shutdown.

2 And in the 90s, we had the thermal lag.

3 And a lot of that wrap was taken out. And a lot of  
4 manual actions or assumptions were put into place.

5 And I don't mean to say that there was -- well, the  
6 point that I am trying to make is that there was  
7 another change. There was the removal of a lot of  
8 these thermal lag which was relied on to protect  
9 cables and probably would have mitigated many spurious  
10 actuations, many multiple spurious.

11 MEMBER MAYNARD: And I'm not saying at  
12 this point that they shouldn't be considered now. I'm  
13 challenging the regulatory positions that says all  
14 along everybody should have always done this. I think  
15 that, you know, we're now setting, you know, these are  
16 the things that definitely need to be considered.

17 If those were considered 20, 30 years ago,  
18 if that was part of the regulatory position for the  
19 licenses, we wouldn't have gone through a 20-year  
20 period here of trying to figure out what it really  
21 requires the licensee to do. Again, it's a regulatory  
22 -- I believe that this is something that falls within  
23 the backfit.

24 It needs a better analysis overall. And  
25 that doesn't mean that it is a bad thing to do. I'm

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1 just saying that I do not believe that we can take the  
2 position that this is a requirement that has already  
3 been there, that everybody should have already done.  
4 And that is kind of what we are saying in this generic  
5 letter.

6 MR. KLEIN: This is Alex Klein of NRR. I  
7 just wanted to add to the discussion here that -- and  
8 Bob can clarify this also for me -- is that the  
9 generic letter did receive CRGR approval. We did go  
10 to that Committee.

11 There are subsequent slides in Bob's  
12 presentation, I think 23, 24, 25, that does talk  
13 about the background, the regulatory background that  
14 you are speaking of that might clarify some of these  
15 discussion questions.

16 MEMBER MAYNARD: I'd be glad to look at  
17 that.

18 MR. WOLFGANG: Well, and also attend CFR  
19 Part 50, Appendix R, it also talks about you have to  
20 consider hot shorts. It doesn't set a limit on the  
21 number.

22 MEMBER MAYNARD: Well, I understand that.  
23 But there is a number of the regulations that come to  
24 an agreement between the licensee and staff as to what  
25 are -- what do you have to assume in a number of those

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1 things.

2 So anyway, we will get into it maybe aq  
3 little more with the regulatory evaluation. But I do  
4 not agree that --

5 CHAIRMAN WALLIS: Well, could we clarify  
6 this first bullet? I mean it seems to me that if we  
7 did have this long-held regulatory position, which was  
8 being enforced, then you wouldn't need this generic  
9 letter.

10 MEMBER MAYNARD: Right.

11 CHAIRMAN WALLIS: So something has changed  
12 as the result of these tests. So maybe there was a  
13 position which wasn't very well enforced or something  
14 or was not properly interpreted by the industry. Is  
15 that the problem?

16 MEMBER MAYNARD: Or the staff?

17 CHAIRMAN WALLIS: Well, the staff, yes.

18 MR. FRUMKIN: Well, I think we -- well,  
19 Bob, I think I would say that something did change.  
20 And that thing may not have been entirely the tests.  
21 I think that the staff had high confidence that these  
22 fire barriers that were installed were separating  
23 these redundant trains.

24 And they were removed and they were  
25 replaced with non-barrier solutions which were

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1 analysis, manual actions, and those type of things.  
2 And as soon as the NRC started inspecting post-thermal  
3 lag fixes, which was in 1997, well before these tests.

4 We had numerous -- there was an information notice  
5 97-something which presented numerous hot short and  
6 multiple -- well, numerous alternate associated  
7 circuits and circuit failure type issues.

8 So to hang this entirely on the test is  
9 not -- certainly the staff position goes before -- to  
10 before the tests. And that has been documented in  
11 that generic -- that information notice and there was  
12 a letter sent to NEI which expressed this sentiment  
13 well before -- I believe that was before the test as  
14 well.

15 CHAIRMAN WALLIS: The purpose of the  
16 generic letter is to reinforcement your enforcement  
17 which you were a bit lax about before or something?  
18 Is that what its purpose is?

19 MR. WOLFGANG: There was a lot of  
20 confusion. You were talking about 3(g)(iii) about  
21 alternative and dedicated shutdown systems and the use  
22 of one only -- you had to consider one spurious  
23 actuation there --

24 MR. FRUMKIN: Right, 3(g)(iii) and the  
25 Generic Letter 86-10 talked about spurious actuations

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1 quite a bit but the staff position is that those  
2 didn't apply to 3(g)(ii) and they were erroneously  
3 applied to 3(g)(ii), which is all we're really talking  
4 about right now. We are not talking about these 3(g)  
5 (iii) inspections that occurred in the 80s. We're not  
6 talking about the 3(g)(iii) approvals.

7 Every 3(g)(iii) program should have been  
8 approved with an SER. That was the policy. But we  
9 did not go into the 3(g)(ii) areas because the  
10 barriers and those solutions should have been  
11 sufficient.

12 MEMBER MAYNARD: It just seems to me that  
13 with all the confusion that has gone on for a number  
14 of years on this, a much cleaner way of doing this is  
15 if the NRC believes that this is something that needs  
16 to be done is just to come out with it as a  
17 requirement following the process for rulemaking, for  
18 changes, or whatever rather than trying to handle it  
19 through a generic letter requesting information to  
20 show compliance with a very confusing set of  
21 requirements.

22 MEMBER-AT-LARGE SIEBER: I suspect,  
23 though, that the staff does not believe that  
24 rulemaking is required, that the proper regulations  
25 already exist.

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1 MR. FRUMKIN: That is correct.

2 MEMBER-AT-LARGE SIEBER: In the review  
3 process that the staff has used in the past does not  
4 establish new regulations. The regulations are the  
5 regulations. And how the staff reviews something is  
6 another matter.

7 MEMBER MAYNARD: Well, how they review it  
8 but what it is accepted as to your certain assumptions  
9 and things --

10 MEMBER DENNING: I'm sure we are going to  
11 come back to this issue. So why don't you go ahead --

12 MEMBER-AT-LARGE SIEBER: It won't go away.

13 MR. WOLFGANG: Okay, moving to the next  
14 slide, more purposes of issuing a generic letter,  
15 respond to the Agency's need to provide clarification  
16 and closure of outstanding fire protection issues,  
17 respond to the licensee's request to provide  
18 clarification of regulatory expectations, and respond  
19 to the region's request to provide clarification of  
20 regulatory expectations for circuit inspections. And  
21 circuit inspections were resumed January 2005.

22 Generic letter, what information it is  
23 requesting from the licensees. Within 90 days to  
24 evaluate their licensing basis and information in the  
25 generic letter regarding multiple spurious actuations

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1 in the Post-Fire Safe-Shutdown Circuit Analysis.

2 MEMBER MAYNARD: Is that practical to  
3 expect -- I think we might get into a little bit more  
4 as to what we are really asking here but within 90  
5 days, for the whole industry to do this, I'm sure  
6 there is going to be some resources -- external  
7 resources needed in some cases.

8 With the whole industry trying to use  
9 those, is 90 days really a practical time frame to get  
10 what is really being asked for here?

11 CHAIRMAN WALLIS: Well, we believe that it  
12 is. But, you know, I guess when NEI talks, they have  
13 a consensus from the industry that it is not a  
14 sufficient time, We can always adjust that.

15 MR. WOLFGANG: Yes, I think what is being  
16 asked here is not for the technical evaluation of the  
17 entire circuit analysis. What we are asking for is  
18 for licensees to report whether they have a multiple  
19 spurious licensing basis or they have a single  
20 spurious licensing basis.

21 For those plants that have a multiple  
22 spurious and haven't analyzed for multiple spurious,  
23 then that is going to be a long-term fix. All we are  
24 asking them to do is to report their situation within  
25 90 days, which is a licensing --

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1                   MEMBER DENNING: Wait a second. How do  
2 they submit their functionality assessment of effected  
3 SSCs without doing that total analysis? Am I missing  
4 something here? And this is within 90 days, if  
5 you're not in compliance, you have to submit this  
6 functionality assessment of effected SSCs.

7                   MEMBER APOSTOLAKIS: And compensatory  
8 measures.

9                   MEMBER DENNING: And compensatory  
10 measures. I think that is the whole analysis, isn't  
11 it? I mean you don't necessarily know how you are  
12 going to ultimately correct them but it seems to me  
13 that the analysis has to be done in 90 days.

14                   Incidentally, I should have mentioned that  
15 listening in is EPM, which is a company that does this  
16 kind of stuff. But I should have mentioned that  
17 earlier that we do have an open line here.

18                   I'm sorry, go ahead.

19                   MR. WOLFGANG: Yes, what we are asking --  
20 yes, to submit the functionality assessment of  
21 effected SSCs.

22                   MEMBER DENNING: Yes. How do you  
23 determine what SSCs are effected unless you have  
24 looked at the multiple spurious actuations.

25                   MR. WOLFGANG: Yes, they have to look at

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1 the multiple spurious actuations.

2 MR. FRUMKIN: First, I agree with the  
3 member that doing a full analysis for 104 plants in 90  
4 days is not going to be credible. This is a major  
5 effort to look at that.

6 I believe though that the second bullet of  
7 compensatory measures for these areas where the plants  
8 are capable of putting compensatory measures and then  
9 solving the problems in a long-term program. That is  
10 credible. That is possible.

11 MEMBER APOSTOLAKIS: It seems to me that  
12 the 90 days applies to the first bullet but not the  
13 sub bullets.

14 MEMBER MAYNARD: I think it does a -- it  
15 certainly applies to the first bullet.

16 MEMBER DENNING: But the sub bullets are  
17 there in the generic letter.

18 CHAIRMAN WALLIS: Well, why is there an  
19 assumption that they are not in compliance now? I  
20 mean that they have done various things today to meet  
21 the regulations already. And their position would  
22 probably be we are in compliance now. So what are you  
23 asking us to do?

24 MEMBER DENNING: No, I don't think so.

25 MEMBER-AT-LARGE SIEBER: Well, if you took

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1 the lag out of your plant --

2 CHAIRMAN WALLIS: That's the problem.

3 They have changed something.

4 MEMBER-AT-LARGE SIEBER: You changed the  
5 configuration.

6 CHAIRMAN WALLIS: That is okay. So they  
7 have changed something. Thank you.

8 MEMBER DENNING: It is not just that,  
9 Graham. They have argued that this has not been the  
10 requirement. That you didn't have to do multiple  
11 spurious actuations. They did one at a time or a  
12 single. So they would argue this is not the  
13 regulatory -- they would argue that it is new  
14 requirement but kind of like Otto has.

15 MEMBER KRESS: But the regulation says  
16 broadly that under these conditions, you have to have  
17 one train of safe shutdown. And that can only be  
18 interpreted as multiple spurious actuation I think.

19 MEMBER MAYNARD: I don't think -- I don't  
20 agree with that. Through the regulatory process, you  
21 don't necessarily have to assume everything that  
22 anybody could ever conceivably come up with. And so  
23 that's why the NRC and the industry -- but you decide  
24 on a set of assumptions. And what you really have to  
25 assume to reasonably meet that requirement.

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1           And then as new information comes along,  
2           if those previous assumptions weren't conservative  
3           enough, you may need to do that. But that really  
4           constitutes a change there. Otherwise why would you  
5           have any guidance documents or any -- what is allowed  
6           to assume or whatever. So I would argue that it is  
7           part of it.

8           MEMBER DENNING: In some respect, this is  
9           an open-ended problem in terms of, you know, and so it  
10          begs for some kind of guidance as to where you end the  
11          search for things that can go wrong.

12          Continue.

13          MR. WOLFGANG: We are asking that within  
14          six months to submit the plan to return all effected  
15          SSCs to compliance with the regulatory requirements.  
16          And that is the plant modifications, license .  
17          Exemption request.

18          And we are also asking that within 30  
19          days, if you cannot meet the 90-day, six month  
20          schedule that we are requesting, you provide us  
21          notification you cannot meet it and your suggested  
22          schedule and completion date.

23          CHAIRMAN WALLIS: What kind of things  
24          would they do to come into compliance? Are they going  
25          to change these offending cables? Are they going to

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1 change the way in which they put out fires? Are they  
2 going to change the actual equipment in the SSC? It  
3 is very open ended what they are expected to do.

4 MR. WOLFGANG: Yes, they can protect  
5 cables. They can reroute cables. They can submit  
6 license amendments based on a risk analysis method --  
7 those type of things.

8 CHAIRMAN WALLIS: Manual actions?

9 MR. WOLFGANG: Well, not in 3(g)(ii)  
10 space. There are a lot of ways.

11 MEMBER DENNING: I don't know how  
12 expensive those ways are. I mean we say there are  
13 lots of ways but those ways may be extremely  
14 expensive.

15 CHAIRMAN WALLIS: Well, I'm also unclear  
16 about what it is they are supposed to assume can go  
17 wrong? When I read these things about they are  
18 supposed to assume the possibility that this can  
19 happen, it goes back to Otto's question here.

20 I mean if you assume the very worst that  
21 could possibly happen, then you could have enormous  
22 changes in the plants in order to avoid this worst  
23 conceivable thing. Is that what you are asking them  
24 to do?

25 MR. WOLFGANG: You have to assume all

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1 multiple spurious actuations.

2 CHAIRMAN WALLIS: Well, but that is a  
3 major thing, isn't it?

4 MEMBER MAYNARD: That is major.

5 CHAIRMAN WALLIS: You have to assume that  
6 it happens with the probability of one?

7 MR. WOLFGANG: Yes.

8 MEMBER-AT-LARGE SIEBER: Yes. On the  
9 other hand --

10 MR. WOLFGANG: 3(g)(ii) in deterministic  
11 space doesn't limit the number of --

12 MEMBER-AT-LARGE SIEBER: On the other  
13 hand, you restrict the fire to a single fire area,  
14 which means that if you have appropriate separation or  
15 fire barriers that you have a train that is free of  
16 fire, that will operate.

17 MR. WOLFGANG: Right.

18 MEMBER-AT-LARGE SIEBER: And that is the  
19 principle. I think it is going to vary dramatically  
20 from plant to plant, especially based on the age of  
21 the plant and the type of plant. I think some are  
22 going to be tremendously impacted. Some others may  
23 not. And again, depending on what assumptions you  
24 really have to make and what credit you can take for  
25 things you already have in place, things that have

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1 already been done, everything from operator actions to  
2 fire loadings, improvement in fire control,  
3 everything.

4 MEMBER DENNING: And, Jack, you talked  
5 about the separating of trains. And that's, you know,  
6 pretty straight forward. But isn't the real open  
7 endedness related to the spurious actuations where  
8 there is some unanticipated valve opens that effective  
9 give you a loss of coolant accident or something like  
10 that, that, you know, introduces a different element  
11 to safe shutdown. Isn't that the open-endedness that  
12 makes it so difficult.

13 And I also don't know whether -- how many  
14 plants really know what cables are in what trays  
15 within a room.

16 Obviously if you are going to do -- yes so  
17 that you basically are assuming anything within the  
18 room -- I mean you know that -- you have concluded  
19 that it has gone through a room up to this point.  
20 But, you know, they could be in totally different  
21 trays in the room. But you don't know where they are  
22 in the room.

23 CHAIRMAN WALLIS: Well, you have to assume  
24 that they are all together and they are all --

25 MEMBER DENNING: Assume that you have to

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1 submit it. But I don't know the answer to that.

2 MEMBER KRESS: Assume that you have to do  
3 it. But I don't know the answer to that.

4 MR. WOLFGANG: Well in a fire area in a  
5 room, if you assume a fire, you have to assume  
6 everything is --

7 MEMBER KRESS: Yes, but can everything  
8 have an inter --

9 CHAIRMAN WALLIS: Everything in that room  
10 can short together?

11 MEMBER KRESS: -- can it short together as  
12 an inter-cable connection even though it may be way  
13 separated?

14 MR. FRUMKIN: No, if it couldn't occur,  
15 then it wouldn't be -- I mean you wouldn't have -- we  
16 wouldn't be expecting energized cables to penetrate  
17 conduits. We wouldn't expect energized cables to jump  
18 from tray to tray.

19 Or, for example, DC current has to have  
20 the same path. If it is not in the same tray or same  
21 conduit you couldn't actuate that from an AC circuit  
22 or something of that nature.

23 MEMBER DENNING: I don't know whether --  
24 what utilities know what cables --

25 MR. FRUMKIN: Right, no, you are correct.

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1                   MEMBER DENNING: -- are in what trays you  
2 were going to run.

3                   MR. FRUMKIN: And that can be a very  
4 significant effort.

5                   One of the aspects is that for the  
6 3(g)(ii) area -- or for the 3(g)(iii) plants, some of  
7 the older plants are 3(g)(iii). And they don't have  
8 very much separation at all. But they have done a  
9 significant analysis that was reviewed in the 80s  
10 which we referred to earlier. And they do have the --  
11 because they have done that detailed analysis, they  
12 have the flexibility to do manual actions.

13                   So in effect, the newer plants with the  
14 good separation should be fairly well off. The older  
15 plants that had very little separation probably have  
16 done a lot of this analysis already and may already be  
17 in compliance.

18                   It is the middle plants that are more  
19 likely than the older plants to have the circuits  
20 traced. But they are kind of in the middle there.  
21 And they are the ones who I think are going to be  
22 having a more difficult time answering this generic  
23 letter.

24                   MEMBER-AT-LARGE SIEBER: That is a pretty  
25 limited number of plants then. This issue is, you

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1 know, I was a young man when this issue came out. The  
2 work has been done. And the plants that were built in  
3 the 80s, to my knowledge they all had pull tickets  
4 associated with cables when they were originally  
5 routed.

6 So you just run your computer and it tells  
7 you whether you've got separation or not. And if you  
8 don't, what circuits are offending circuits.

9 MR. FRUMKIN: Many plants have that. Or  
10 some plants have that.

11 MEMBER-AT-LARGE SIEBER: Some plants have  
12 it. Some plants had to do that all manually, hand  
13 over hand.

14 MR. FRUMKIN: But I just want to add one  
15 thing that the staff has come our with a statement --  
16 or, well, not really a statement but what 3(g)(ii)  
17 says is that when cables of the redundant trays are  
18 within the same fire area and are not protected, so if  
19 you have a area with train A equipment in it and no  
20 train B equipment or the train B is protected in  
21 accordance with 3(g)(iii) protection criteria, we're  
22 not -- so with the train B protected, we're not  
23 limiting the actions that -- the feasible and reliable  
24 actions for failures on train A.

25 So if you have a protected train outside

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1 of a fire area or protected with 3(g)(ii), the  
2 licensees can do feasible and reliable manual actions  
3 on the fire-effected train to let's say close that  
4 valve that opens spuriously or stop that pump that  
5 opens spuriously because there is a full -- typically  
6 from the control room, so there is good annunciation  
7 and indication, there is a full protected train  
8 outside of that fire-effected area.

9 And I'll just point to Alex and see if he  
10 nods at me. Okay, yes.

11 MEMBER-AT-LARGE SIEBER: And there is very  
12 limited amounts of equipment if you had a spurious  
13 actuation, would cause another accident like a LOCA.  
14 Some value opens in the valve is -- like a safety  
15 injection valve, is designed to pump in not pump out.

16 Okay, so there are check valves and things  
17 like that that would prevent that. But there area  
18 few cases -- PRVs for example --

19 MR. FRUMKIN: Yes, PRVs is one I was  
20 thinking of if you --

21 MEMBER-AT-LARGE SIEBER: Yes , that could  
22 open and --

23 CHAIRMAN WALLIS: New plant designs have  
24 this screw valves. And the spurious actuation of them  
25 create a LOCA.

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1 MEMBER-AT-LARGE SIEBER: Yes, but they  
2 have them so you get to a safer condition, right?

3 CHAIRMAN WALLIS: One question I was going  
4 to --

5 MEMBER-AT-LARGE SIEBER: It is just  
6 expensive to do it.

7 MEMBER DENNING: Yes, is there any kind of  
8 assessment as to what fraction of spurious actuations  
9 actually are deleterious as far as effecting safe  
10 shutdown capability? I mean has anybody in a risk  
11 study done that kind of an assessment? Or do you have  
12 any feeling as to the fraction of spurious actuations  
13 that will get you into trouble?

14 MR. FRUMKIN: Well, you asked for that.  
15 We have this bounding analysis that we did and you  
16 actually -- well, you have to look at a lot to find  
17 the ones that are going to give you problems from a  
18 spurious actuation standpoint. But in our bounding  
19 analysis, it took five pairs of spurious actuations in  
20 order to get a significant risk.

21 And it is because these spurious system --  
22 these multiple spurious effect systems that, you know,  
23 are the redundant train. So it effects both -- the  
24 train, the productive train or the unprotected train,  
25 and the redundant train so you really lose all your

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1 protection with these scenarios. And it doesn't --  
2 you have to look at a lot to find the bad players.  
3 And there don't actually have to be a lot of bad  
4 players, at least based on our bounding analysis for  
5 it to be of fairly high risk significance.

6 MEMBER DENNING: Continue please.

7 MR. WOLFGANG: Background since 1997,  
8 multiple LERs brought lack of consensus concerning  
9 circuits to the staff's attention. And this led to a  
10 moratorium on inspection of circuit issues back in  
11 1997.

12 In 2001, NEI/EPRI cable fire test  
13 demonstrated that multiple spurious actuations can  
14 occur. And they can occur in rapid succession or  
15 simultaneously without sufficient time for mitigation  
16 in between.

17 Therefore if a licensee doesn't account  
18 for multiple spurious actuations, and its circuits  
19 analysis, the licensee may not be in compliance with  
20 10 CFR 50.48 and 10 CFR Part 50, Appendix A, General  
21 Design Criteria, and (3) which require that a licensee  
22 provide and maintain free from fire damage, one train  
23 of systems necessary to achieve and maintain the safe  
24 shutdown.

25 Staff has developed the risk-informed

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1 approach to inspections to focus on risk-significant  
2 configurations based on the cable fire test. And this  
3 is RIS 2004-003.

4 MEMBER DENNING: Now let me ask with  
5 regard to that, I understand that that was prepared  
6 for inspection as opposed to compliance.

7 MR. WOLFGANG: Correct.

8 MEMBER DENNING: But is there a real  
9 reason why one couldn't use guidance of that type for  
10 compliance as well? Do you see a regulatory  
11 constraint that would prevent you from -- I mean from  
12 the regulations that exist now, do you think it would  
13 be incompatible for the staff to provide the  
14 equivalent, perhaps a perturbation off of that or  
15 perhaps a revision to NEI's risk-informed guidance?  
16 Why can't we do that?

17 MR. WOLFGANG: I think the thing is we  
18 haven't seen licensee's risk tools, their model that  
19 we would have to approve prior to them using any risk  
20 analysis.

21 MR. KLEIN: Let me take a shot at  
22 answering the question maybe at a higher level. And  
23 that is with respect to licensees who are required to  
24 meet the requirements of Appendix R. Don't today have  
25 the ability to change that regulation or the

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1 commitment to that regulation based upon risk  
2 information.

3 If they want to do that, they would have  
4 to seek an exemption request from us against the  
5 regulation. They may certainly use risk information if  
6 they want to come in and see us with an exemption  
7 request, that is certainly open to them.

8 But what I think Bob is indicating is that  
9 a licensee may not make a change in their plant using  
10 risk information and making the conclusion based upon  
11 their standard license condition that says that, you  
12 know, it doesn't effect their ability to achieve and  
13 maintain safe shutdown.

14 The staff has been telling licensees that  
15 we would like them to come in and see us for such an  
16 exemption request or a license amendment.

17 MEMBER DENNING: Yes, I understand that  
18 that is the way -- that is the process by which they  
19 would use risk information to do that. But this first  
20 bullet is generic. It is generic information as to  
21 how many combinations of things or what are kinds of  
22 situations that are -- could be expected to be risk  
23 significant?

24 Now I realize it is not totally complete  
25 but it, you know, it gave guidance to the inspectors

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1 as to what are the combinations of things that could  
2 risk significant to look at and make sure. And I  
3 don't see any reason why one couldn't effectively rule  
4 out some of this total space of situations that the  
5 applicant has to look at to be compliant.

6 Now, you know, Tom is saying -- and I  
7 think it is kind of the regulatory position that  
8 you've got to look at everything because anything that  
9 can prevent this safe shutdown pathway is a potential  
10 problem. But you used it for the inspector to give  
11 him guidance on what is risk important and not in the  
12 area.

13 Couldn't you have done the same to provide  
14 generic guidance on this is how far you have to go in  
15 this process of looking at multiple spurious  
16 actuations.

17 MR. FRUMKIN: Bob, let me -- I'll be  
18 candid. We tried very hard to read 3(g)(ii) as a --  
19 to be risk informed in the way you describe. And with  
20 help from our lawyers, we were unable to get there for  
21 those pre-`79 plants. And then there is also the  
22 Agency or the Commission has approved a risk-informed  
23 rule.

24 And although it is more comprehensive,  
25 that is out there. And we considered the possibility

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1 of a risk-informed changed to this rule, to the  
2 current 3(g)(ii), and there is currently a rule that  
3 has been promulgated by the Commission. So that did  
4 not seem like a credible approach.

5 CHAIRMAN WALLIS: Well, could I follow up  
6 on that? And I looked at this risk informed approach.  
7 It seems to be just advice on vendors --

8 MR. FRUMKIN: Yes?

9 CHAIRMAN WALLIS: -- to focus on certain  
10 configurations. Well, that's okay. Focus on what  
11 matters. But then how does this inspector decide to  
12 reach some sort of a finding that something is not  
13 adequate? Or is not in compliance. That would get  
14 closer to tying these things together because the  
15 whole question here is what do they have to do in  
16 order to be in compliance.

17 MR. FRUMKIN: That is correct.

18 CHAIRMAN WALLIS: And how does the  
19 inspector know when they are in compliance or not?  
20 Well, he has just chose to focus on these things. How  
21 does he then decide when he is focused whether or not  
22 they are in compliance?

23 MR. FRUMKIN: And the answer to that is  
24 they pull up the licensing basis and if the licensing  
25 basis, if they do not have -- are not licensed for

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1 single spurious, that are considered to be -- required  
2 to look for multiple spurious.

3 CHAIRMAN WALLIS: Well then what are they  
4 supposed to do?

5 MR. FRUMKIN: Then that would be -- that  
6 could be -- that would be a finding would be run  
7 through the risk analysis of this STP. It would be  
8 cited. And the licensee would have to resolve a  
9 finding in the normal manner.

10 MEMBER DENNING: Incidentally, I think  
11 your last statement about their legal interpretation  
12 of pre-`79 is very important as far as our  
13 considerations are concerned because I mean it could  
14 be indeed that we are in a box in terms of whether you  
15 can risk inform the current regulation or whether you  
16 would need to change a rule which is obviously a huge  
17 undertaking.

18 CHAIRMAN WALLIS: Well, I'm really  
19 wondering, you made an initial statement that we  
20 should have had a subcommittee meeting. We seem to be  
21 at the level of behaving like a subcommittee so trying  
22 to determine whether or not you are ready to go to the  
23 full Committee because there seems to be so many  
24 questions here. And yet we are here as a full  
25 Committee.

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1                   MEMBER DENNING: That is why we have three  
2 whole hours.

3                   CHAIRMAN WALLIS: You know subcommittees  
4 sometimes have the option of saying you guys aren't  
5 ready. You shouldn't go to the full Committee. But  
6 they are here.

7                   MEMBER DENNING: The full Committee has  
8 that same option, doesn't it?

9                   MR. WOLFGANG: To continue, in 2004, staff  
10 held a public meeting in Atlanta to discuss the staff  
11 positions and solicit stakeholder feedback. We worked  
12 with NEI to finalize an acceptable industry guidance  
13 document for circuit analysis. And that was NEI 0001.

14                   Staff issued RIS 2005-30 to clarify  
15 regulatory requirements for a circuit analysis. And  
16 that RIS addressed the terms associated circuits, any  
17 and all, and emergency control stations.

18                   And this draft generic letter was issued  
19 for public comment in October 2005. We held a public  
20 meeting in March of this year. And the pertinent  
21 public comments were incorporated into the final draft  
22 of the generic letter. And we also received CRGR  
23 approval to issue the generic letter.

24                   The basis for the generic letter -- the  
25 bulleted review of NRC regulations, generic

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1 communications, correspondence related to this issue.  
2 And we have references identified in the generic  
3 letter. The results of the 2001 NEI EPRI cable fire  
4 test program, prior to the cable fire test, there was  
5 very little information available regarding circuit  
6 failure during a fire which made enforcement of the  
7 regulations in this area difficult. And also input  
8 from inspectors on issues that needed to be addressed.

9 The issue clarified in the generic letter  
10 is multiple spurious actuations. As Dan said earlier,  
11 some licensees claim that only a single spurious  
12 actuation had to be assumed in their circuit analysis.  
13 This was based on a misinterpretation of Generic  
14 Letter 86-10 in response to question 5.3.10.

15 And also some licensees claimed multiple  
16 spurious actuation occur with sufficient time in  
17 between them to take mitigating actions.

18 CHAIRMAN WALLIS: Now this  
19 misinterpretation has been going on for how long?  
20 D.L. 86 is 9/86?

21 MR. WOLFGANG: Yes.

22 CHAIRMAN WALLIS: Over 20 years they have  
23 been under some misapprehension about the regulations?

24 MR. WOLFGANG: That is my understanding.

25 MR. FRUMKIN: In this section of the

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1 generic letter, it refers to the 3(g)(iii) associated  
2 circuits I believe. So it took 3(g)(iii) alternate  
3 shutdown -- I'm sorry -- it took this 3(g)(iii)  
4 assumption and applied it to 3(g)(ii) areas. And that  
5 is what this misinterpretation is describing.

6 MEMBER APOSTOLAKIS: Let me understand it  
7 a little bit the second bullet here. Suppose there is  
8 sufficient time between actuations? Okay, so you have  
9 the first one. You really don't know what the second  
10 one is going to be, right? It could be anything.

11 MR. WOLFGANG: Second.

12 MEMBER APOSTOLAKIS: Oh, let's say there  
13 are two --

14 MR. WOLFGANG: Actuations?

15 MEMBER APOSTOLAKIS: -- spurious -- yes.

16 MR. WOLFGANG: Yes, based on these tests,  
17 they could occur --

18 MEMBER APOSTOLAKIS: No, I understand  
19 that, that it is a very short time.

20 MR. WOLFGANG: Right.

21 MEMBER APOSTOLAKIS: But let's assume for  
22 a moment that there is sufficient time, there is long  
23 time between them.

24 MEMBER DENNING: And there may be, George.  
25 There is a contention that --

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1 MEMBER APOSTOLAKIS: Okay.

2 MEMBER DENNING: Yes, right.

3 MEMBER APOSTOLAKIS: But you still don't  
4 know what the second one is going to be.

5 MEMBER DENNING: Is going to be, right.

6 MEMBER APOSTOLAKIS: So you can really  
7 take mitigations actions without know what the second  
8 will be?

9 MEMBER DENNING: Well, now wait a second.  
10 If you have mitigated the first one --

11 MEMBER APOSTOLAKIS: Yes.

12 MEMBER DENNING: -- then it is as if you  
13 now just have one.

14 MEMBER APOSTOLAKIS: Oh, so now you are  
15 going to get together and wait.

16 MR. WOLFGANG: And when the second one  
17 occurs and you have time to mitigate that one.

18 MEMBER APOSTOLAKIS: And this is doable?  
19 I mean has anybody looked into the details of this?  
20 It comes back to this issue of open endedness. You  
21 really don't know what is going to happen next. So I  
22 don't understand this particular -- I mean have they  
23 submitted details, you know, if you have sufficient  
24 time, you will protect the plant?

25 MEMBER DENNING: You know what I think

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1 would help us is we had some better feeling as to how  
2 do they really mitigate these actuations?

3 MEMBER APOSTOLAKIS: Yes, exactly,  
4 exactly.

5 MEMBER DENNING: What is a typical -- and  
6 I know there are constraints on manual --

7 MR. WOLFGANG: Yes, in 3(g)(ii), they  
8 can't use manual actions.

9 MR. KLEIN: Licensees have commonly used  
10 operator manual actions to mitigate that spurious  
11 actuation. They may send an operator out in a plant  
12 to close a valve or some such action like that. And  
13 then they wait for the next actuation and they say,  
14 okay, I've got plenty of time available to have taken  
15 that first action. And now they wait for the second  
16 action. And when that occurs, they send the operator  
17 out.

18 So I think that second bullet there is to  
19 just simply indicate to the Committee that that is the  
20 claim that some licensees have made. That is not  
21 necessarily a position that the staff agrees with.

22 MEMBER APOSTOLAKIS: No, I understand  
23 that.

24 MR. WOLFGANG: Yes.

25 MEMBER APOSTOLAKIS: But I'm trying to

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1 understand the position.

2 MEMBER DENNING: Now suppose you had --  
3 suppose it takes 30 minutes to have them get out there  
4 and close the valve, now obviously -- more than, you  
5 know, and then something else happens say before he  
6 closes that valve, then the real question is there a  
7 compounding effect?

8 MR. WOLFGANG: And I guess like --

9 MEMBER DENNING: As far as you don't have  
10 enough operators that you can send out to do all these  
11 --

12 MEMBER APOSTOLAKIS: The real question is  
13 is the length of time the critical variable here. And  
14 it doesn't seem to me to be.

15 MR. FRUMKIN: I mean we'll give you an  
16 example, for example if you have a -- you going to  
17 drain two valves in series that would drain the RWST  
18 and you also damage a number of other equipment. They  
19 fail. They short out and become unavailable.

20 Well, if you have -- if you lose the  
21 indication on the RWST and you open up the valve and  
22 you say you have plenty of time to -- you have  
23 indication the valve opened spuriously, you can go  
24 down and close the valve and then when the next valve  
25 opens, it has no effect.

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1 I think that would be an example of where  
2 they feel they would have sufficient time. Let's say  
3 the circuits are in cable trays -- you know, 20, you  
4 know, six cable trays above. There is going to be a  
5 good deal of time before the first cable tray is  
6 damaged and the next -- the first cable is damaged and  
7 then the next cable.

8 So -- and from a risk standpoint, you  
9 might be able to argue yes, we will have adequate  
10 indication that the valve opened and we have adequate  
11 time. And then that could be a risk-informed type  
12 analysis.

13 But if they are in the same cable, then  
14 they both could open simultaneously.

15 MEMBER MAYNARD: If there is time and  
16 there are a number of things they can do, when you  
17 have a fire in an area, you typically know what cables  
18 and what other things could be potentially effected in  
19 that and the manual actions going out either manually  
20 isolating valves, pulling breakers, a number of things  
21 you can do. But it is based on what is in that area  
22 or what could be effected with those in that area.

23 MEMBER APOSTOLAKIS: I remember when I was  
24 reading the analysis of the Browns Ferry fire a long  
25 time ago. They did have spurious actuations there did

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1 they not?

2 MR. WOLFGANG: Yes.

3 MEMBER APOSTOLAKIS: Within 20 minutes I  
4 believe they had all sorts of signals and so on. And  
5 then things started going dead. How does that  
6 experience fit into this?

7 MR. FRUMKIN: I think that experience is  
8 "the long-held staff position" that multiple  
9 simultaneous spurious actuations occur. I think when  
10 you want to point your finger to where we come up with  
11 that, it comes from 1975. It comes from the very  
12 beginning of fire protection regulation is that these  
13 spurious actuations occur.

14 And I think that -- unfortunately the  
15 statements of consideration for Appendix R are short.  
16 You know we have, you know, dozens of pages for a  
17 short NFPA-805 and there may be a dozen pages and a  
18 page maximum for 3(g)(iii) -- for 3(g) of Appendix R.  
19 So we really can't go back in time and pull out the  
20 basis for that. But we have Mark Sallies here, he  
21 might be able to shed some light on that.

22 But I believe that that is the long-held  
23 staff position is the Appendix R fire and these  
24 multiple spurious and rapid succession starting pumps  
25 giving incorrect indication, doing all sorts of

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1 unpleasant things to the plant.

2 CHAIRMAN WALLIS: The incorrect indication  
3 is a big problem. Something has happened and yet you  
4 don't know quite what has happened. That is another  
5 variable altogether from the time. I mean it is the  
6 uncertainty of knowing what is going on which might  
7 lead the operator to do the wrong thing.

8 MEMBER-AT-LARGE SIEBER: Yes, on the other  
9 hand, indications usually either go full scale or to  
10 zero.

11 MEMBER MAYNARD: A lot of times you've got  
12 multiple indications. And that is something they are  
13 trained on quite a bit is on instrument failures.  
14 That said, it is not uncommon to have an instrument  
15 failure without a fire. So they are trained on how to  
16 handle that.

17 MR. FRUMKIN: Right. One of the failure  
18 though they can also get -- and, again, there's  
19 multiple indications, but they could get an indication  
20 of a pump starting when it didn't start. Or a pump in  
21 a start and stop position and then that's going to  
22 take time for them to troubleshoot and whether it was  
23 started or stopped could it be adversely effecting  
24 overfilling the plant or not.

25 There are a number of timing issues that

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1 I'm sure they are trained on. But they can be  
2 potentially challenging.

3 MEMBER DENNING: Continue.

4 MR. WOLFGANG: The NRC letter from Sam  
5 Collins to NEI in 1997 stated that multiple spurious  
6 actuations caused by fire-induced hot shorts must be  
7 considered and evaluated. As I stated earlier, Byron  
8 and Braidwood have SCRs approving the assumption of a  
9 single spurious actuation for a fire event. So if the  
10 staff position is applied to them, it would be  
11 considered compliance backfit.

12 The generic letter --

13 MEMBER-AT-LARGE SIEBER: That's a unique  
14 case, those two plants.

15 MR. WOLFGANG: Yes, correct. The generic  
16 --

17 MEMBER APOSTOLAKIS: But what does that  
18 mean now?

19 MR. WOLFGANG: They are in compliance by  
20 definition.

21 MEMBER APOSTOLAKIS: You would say the SCR  
22 was not correct or what?

23 MR. WOLFGANG: They are in compliance by  
24 definition, right.

25 MEMBER APOSTOLAKIS: But I don't

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1 understand this compliance backfit.

2 CHAIRMAN WALLIS: Compliance by mistake is  
3 what I heard earlier.

4 MR. WOLFGANG: Well, by regulatory  
5 approval.

6 MEMBER APOSTOLAKIS: Can you explain the  
7 parenthesis? If stop position is applied to them, it  
8 would be a compliance backfit. You mean the current  
9 position?

10 MR. WOLFGANG: If they comply with their  
11 SER, the SER is approved even though it was a mistake,  
12 it would be a compliance backfit if we made them  
13 change.

14 MEMBER APOSTOLAKIS: So you would have to  
15 admit then that the SER was not correct?

16 MR. WOLFGANG: We have already admitted  
17 that.

18 MEMBER APOSTOLAKIS: Okay.

19 MEMBER MAYNARD: It is a matter of what  
20 regulatory process is used to actually do it. A lot  
21 fo people think backfit is a bad thing. I think it is  
22 a process that should be used a little bit more rather  
23 than trying to go around a lot of these things. Just  
24 say hey look, we've changed or this is a new  
25 requirement. Here's the regulatory burden. Here is

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1 the increased safety benefit. We are imposing this as  
2 the new requirement for you. It's not necessarily a  
3 bad thing. Just what regulatory burden --

4 MEMBER APOSTOLAKIS: But this doesn't  
5 happen too often, right? I mean --

6 MEMBER DENNING: What? Regulatory  
7 mistakes?

8 MEMBER APOSTOLAKIS: Yes.

9 MEMBER DENNING: Right.

10 CHAIRMAN WALLIS: Well, this last bullet,  
11 I have a lot of problem with. And they must be  
12 considered and evaluated. But it seemed to be very  
13 unclear about to what depth and by what methods these  
14 things must be considered and evaluated. That seems  
15 to be so open-ended that the licensee must be  
16 uncertain what he has to do.

17 MEMBER DENNING: RIS provides more detail  
18 than the generic letter does, right. The 2005 RIS.

19 MR. WOLFGANG: 2005-30?

20 MEMBER DENNING: Yes.

21 MR. WOLFGANG: Not on multiple spurious  
22 actuations, no.

23 MEMBER DENNING: No?

24 MR. WOLFGANG: It doesn't address that.

25 We didn't put that in there because we thought

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1 multiple spurious actuations because of this Byron and  
2 Braidwood SCR could be considered possibly a change in  
3 staff position. So that's why we didn't want to put  
4 it in a RIS.

5 CHAIRMAN WALLIS: There is no regulatory  
6 guide that says how to evaluate multiple spurious  
7 actuations?

8 MR. KLEIN: I think if I could respond to  
9 that question, I'll ask Dan also to pipe in. Is on  
10 page 7 of the generic letter where we do talk about,  
11 you know, ways that licensees can bring themselves  
12 into compliance, there is a discussion in there about  
13 the deterministic methodology or NEI-0001.

14 We do talk about the guidance in there in  
15 Chapter 3. We do say that for post-fire safe-shutdown  
16 circuits in conjunction with the guidance provided in  
17 this generic letter that NEI-0001 is one of the  
18 acceptable approaches to achieve regulatory compliance  
19 with the fire protection requirements for multiple  
20 spurious actuations.

21 So that's one example. And Dan can  
22 correct me if I've overstated this.

23 MR. WOLFGANG: And we say in conjunction  
24 with the guidance provided in this generic letter to  
25 mean consider multiple spurious actuation. I believe

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1 NEI-0001 says to consider two spurious actuations.

2 CHAIRMAN WALLIS: That doesn't mean  
3 anything to me. It could simply mean to say well I  
4 considered it and I think it is irrelevant or  
5 something. I mean what does consider mean? But what  
6 depth? By what methods?

7 MEMBER APOSTOLAKIS: To the depth required  
8 to convince the staff.

9 MEMBER BONACA: That is called open ended.  
10 We could fix it here but it seems to me that, you  
11 know, we do have a problem. And we are trying to  
12 figure out what is the best regulatory process to  
13 solve it. But the problem is there.

14 CHAIRMAN WALLIS: Well, I think we agree  
15 there is a problem. It is just whether or not there  
16 is a mature enough process in place to make something  
17 that is workable happen.

18 MEMBER BONACA: I understand.

19 MEMBER-AT-LARGE SIEBER: Well, this work  
20 has already been done once. The only thing that  
21 changed is the disqualification of certain fire  
22 barriers. All the licensees have done this. And it  
23 should be part of their licensing basis. There should  
24 be plant records as to how they did it the first time.

25 MEMBER DENNING: Really, Jack? I mean

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1 isn't there an issue here of the number of licensees  
2 who thought that they were really dealing with one  
3 spurious actuation requirement? Or one at a time?

4 MEMBER-AT-LARGE SIEBER: I can only speak  
5 to one licensee or about one licensee. And that was  
6 not the assumption.

7 MEMBER DENNING: That was not your  
8 assumption.

9 MEMBER-AT-LARGE SIEBER: No.

10 MEMBER DENNING: No. But there are  
11 licensees out there --

12 MEMBER-AT-LARGE SIEBER: Otto, was that  
13 yours? It is sort of obvious from Browns Ferry that  
14 you get more than one.

15 MEMBER MAYNARD: I'm trying to recall  
16 because the only place where we had different trains  
17 mixing was in the control room so it was primarily a  
18 control room-related issue.

19 MEMBER KRESS: But that is one purpose of  
20 the generic letter to find out the status.

21 MEMBER-AT-LARGE SIEBER: The only time the  
22 number of faults becomes an issue is when you are  
23 trying to solve the problem with operator manual  
24 actions. So now you've got too many things for too  
25 few people to do.

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1           But if you have train separation and the  
2 train separation is effective, you are going to get  
3 some spurious actuations which are going to be  
4 upsetting but not fatal. And you are still going to  
5 maintain a full set of safety equipment that  
6 functions. And that is the object of the fire  
7 protection regulation.

8           MR. KLEIN: I would strongly agree with  
9 what Dr. Sieber just indicated in that the focus here  
10 is on 3(g)(ii) compliance and that is where you've got  
11 the redundant trains in the same fire area as Dan had  
12 indicated. And Dan had indicated some of the history  
13 that, you know, led us up to this.

14           And that had to do with the resolution  
15 that some licensees used to address the thermal lag  
16 issue where they removed some of these fire barriers  
17 and in lieu of meeting the separation requirements of  
18 3(g)(ii), elected to put in place the use of operator  
19 manual actions.

20           And I think that is a very important thing  
21 to kind of keep in mind.

22           MEMBER-AT-LARGE SIEBER: But other  
23 licensees pulled no cable.

24           MR. KLEIN: That is correct. I'm not --

25           MEMBER-AT-LARGE SIEBER: They moved

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1 circuits out of the same fire area.

2 MR. KLEIN: Yes, I'm not suggesting that  
3 all licensees implemented unapproved operator manual  
4 actions in lieu of the requirements of 3(g)(ii).

5 There are other licensees who did plant modifications,  
6 did re-analysis, did re-wraps, pulled cables, what  
7 have you to bring themselves back into compliance with  
8 3(g)(ii).

9 MEMBER-AT-LARGE SIEBER: And some of them  
10 didn't use thermal lag to begin with.

11 MR. KLEIN: That is correct.

12 CHAIRMAN WALLIS: Well, I don't really  
13 have a good understanding of what kind of spurious  
14 actions we are talking about, what kind of operator  
15 actions in response we're talking about, and whether  
16 redundant trains solve the spurious action problem.

17 If I have a fire scenario and it switches  
18 on my high pressure injection, I've got a pump that  
19 runs and it is pouring water into the system, right?  
20 For one thing, I have to know -- I have to diagnose  
21 what is happening. Do I have to send somebody  
22 somewhere to shut a valve? And does that factor have  
23 some redundant train help me at all when something has  
24 been activated spuriously? I mean it is not clear to  
25 me what the range of kind of scenarios is that you are

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1 talking about here.

2 And whether redundant trains always help  
3 you or don't. Maybe they don't help you at all  
4 sometimes. And maybe the operator action sometimes is  
5 so severe that it is very difficult to take.

6 MEMBER MAYNARD: I think in most cases,  
7 there are things they can do. But there are some --  
8 and I think the power operator relief valve is one  
9 that if you have a system where you can't operate the  
10 block valve or the PRE, if it opens you basically have  
11 given yourself a small break.

12 CHAIRMAN WALLIS: That's what I think.  
13 When you think about TMR, they had a false indication  
14 because there was a light which said it was closed  
15 when it was open.

16 MEMBER MAYNARD: But most times you are  
17 still covered by -- I mean you are still analyzed for  
18 a small break LOCA or for the other events. A pump  
19 coming on, there are multiple ways to turn pumps off.  
20 And you are not going to be injecting water at such a  
21 rate that you have, you know -- I'm kind of talking  
22 more PWR than I am BWN here so I --

23 MEMBER DENNING: But it is those things  
24 though -- it is the multiplicity of those things that  
25 boggles my mind. You know rather than train

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1 separation and train protection which you talked  
2 about, it just seems like there is such a multiplicity  
3 of potential things and trying to analyze all those  
4 things seems almost open ended.

5 MEMBER-AT-LARGE SIEBER: There aren't --  
6 in sheer numbers, there aren't all that many safety  
7 circuits. And if you go underneath the control room  
8 into the faucet rafter, you'll find loads of jumpers  
9 and knife switches and things like that where you can  
10 de-energize control circuits.

11 Now one of the problems is that it  
12 actually, in a lot of circuit breakers, it takes power  
13 to trip it, you know. The trip coil requires  
14 energization so pulling a knife switch doesn't  
15 guarantee that it will run forever. And so the  
16 operator really has to understand how the control  
17 system is set up to be able to do that.

18 But there are ways to overcome these  
19 problems that don't require excursions all over the  
20 plant. And on the other hand, the plant is designed  
21 to be safe provided that you have a functional safety  
22 train. Separation criteria, if rigidly applied,  
23 provides that independent safety train.

24 MEMBER DENNING: We are going to now take  
25 our break until 20 after 10. And then we will have to

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1 move surprisingly quickly after that.

2 CHAIRMAN WALLIS: Okay. So we're going to  
3 take a break until 20 past 10.

4 (Whereupon, the foregoing matter went off  
5 the record at 10:09 a.m. and went back on the record  
6 at 10:23 a.m.)

7 CHAIRMAN WALLIS: Rich, would you resume  
8 the management of the meeting, please?

9 MEMBER DENNING: Please proceed.

10 MR. WOLFGANG: Okay. The last issue,  
11 clarifying the generic letter, the point we have here  
12 is the staff position on multiple spurious actuations  
13 presented in the generic letter is consistent with  
14 section 9.5.1 of the standard review plan.

15 Public comments. The significant public  
16 comment was that the generic letter constituted a  
17 backfit to licensees. And we addressed this comment.  
18 We obtained CRGR approval to issue this generic  
19 letter. And, as I said earlier, only for Byron and  
20 Braidwood, who have approved SERs that we know of,  
21 would this constitute a backfit.

22 Basically, this generic letter is just a  
23 request for information.

24 MEMBER MAYNARD: I would challenge that.

25 MR. WOLFGANG: Yes. I think --

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1                   MEMBER MAYNARD: That's all right. We'll  
2 comment on that.

3                   CHAIRMAN WALLIS: It isn't just a request  
4 for information. It asks them to do a lot of things.

5                   MEMBER MAYNARD: Yes. That is what I  
6 challenge, that statement. Yes. We've talked about  
7 it.

8                   CHAIRMAN WALLIS: That was what I was  
9 uncertain about.

10                  MEMBER DENNING: Why don't you go ahead  
11 and summarize, even though we're going to have a  
12 couple of other things? Why don't you go ahead and  
13 summarize? Then there are a couple of other things we  
14 would like you to -- we have more than started. We're  
15 almost done.

16                  MR. WOLFGANG: A summary. The generic  
17 letter, as I said before, is a request for information  
18 from licensees. The industry cable fire test program  
19 reaffirmed the staff interpretation of the regulatory  
20 requirements concerning multiple spurious actuations  
21 must be considered in the circuits analysis. The  
22 generic letter is necessary to ensure that all  
23 risk-significant circuit situations are identified and  
24 addressed.

25                  CHAIRMAN WALLIS: Could you go back a bit

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1 and say something about why this came about? I mean,  
2 wasn't this something to do with this thermal lag  
3 business? All of these installations, like Hemmicks  
4 and Eastern, every time we look at them --

5 MR. WOLFGANG: Yes.

6 CHAIRMAN WALLIS: Well, isn't that the  
7 solution would be to have a proper barrier around  
8 these things?

9 MR. WOLFGANG: That's one solution, yes.

10 MEMBER DENNING: I don't see that as a  
11 total solution. I don't --

12 MR. WOLFGANG: That is one solution.  
13 Another solution is a separation, 20-foot separation.

14 CHAIRMAN WALLIS: But in the past, when we  
15 believed that this thermal lag worked, there wasn't a  
16 problem. Is that right?

17 MEMBER MAYNARD: No. I think the problem  
18 was still there then. This has been bounced around  
19 since I know at least the early '80s as an issue. I  
20 think the thermal lag, it helped in some cases where  
21 you could show separation in the trains, but it  
22 doesn't necessarily take care of you if you've got  
23 cables in the same area that are --

24 MEMBER DENNING: Right. They can still  
25 give you spurious actuation, regardless.

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1 MEMBER MAYNARD: Right.

2 MEMBER DENNING: Now, it may be -- do you  
3 have any comments on that?

4 MR. FRUMKIN: Yes. If you have the  
5 separation, you can still get spurious actuations.  
6 And that's a box that we're not in with the rule. The  
7 rule does not require that those be protected. So all  
8 plants have the flexibility for the unprotected train  
9 to mitigate through feasible and reliable manual  
10 actions those types of spurious actuations.

11 Now, if you were to get a spurious  
12 actuation that were to give you all incorrect  
13 indication and was not recoverable, then that would  
14 still have to be resolved because it would be a  
15 potential safety issue. But for the minor ones that  
16 we have been talking about that would be fairly easy  
17 to resolve through a manual operator action or there  
18 are procedural controls or something of that nature,  
19 that would not be a compliance issue per se.

20 MEMBER DENNING: Help me with that because  
21 I still don't quite understand it. So if you have a  
22 protected train and you get a spurious actuation from  
23 an unprotected train, then you have to analyze all  
24 combinations of spurious actuations still, don't you,  
25 that are possible in that unprotected train?

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1 MR. FRUMKIN: Alex, do you want to?

2 MR. KLEIN: Yes, I believe you do because  
3 the over-arching requirement of appendix R is to be  
4 able to safely bring your plant to safe shutdown. And  
5 if you don't know what's occurring in your plant, then  
6 you can't meet that over-arching high-level goal of  
7 achieving and maintaining safe shutdown of your plant.

8 MR. FRUMKIN: And I will just say that  
9 once you have your protective train, your protected  
10 train, your unprotected train has a very limited set  
11 of things that could hurt you.

12 Now, we're talking we have plenty of  
13 water. We have plenty of indication. We have plenty  
14 of everything. But now we might open, we might cause  
15 a drain letdown path to open or we might cause a pump  
16 to start, but we should be getting clear indication of  
17 that in the control room. And in the normal  
18 procedure, process, you'll be getting indication of  
19 these things happening. And they should be able to  
20 mitigate them fairly effectively.

21 Now, there may be some things that would  
22 be difficult to mitigate. And, as Alex says, they  
23 have to find those and find a way to mitigate them.

24 MEMBER DENNING: So you have lots of  
25 things you have to analyze, but the mitigation of it

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1 is probably not too severe for the plant, and the  
2 plant is allowed to do manual action on it.

3 Now, there is another set here. So what  
4 is the other set? Aren't you always required to have  
5 a protected train?

6 MR. FRUMKIN: Yes. And these plants don't  
7 have that protected train. In effect, all circuit and  
8 manual action findings or potential violations are  
9 lack of protection, lack of circuit protection.

10 MEMBER DENNING: Circuit separation.

11 MR. FRUMKIN: So when --

12 MEMBER DENNING: Separation of the --

13 MR. FRUMKIN: Right. So when a finding  
14 comes in, let's say we have that hypothetical finding,  
15 which opens up and drains down the RWST. The citation  
16 is going to be against 3G2, lack of separation and  
17 lack of protection.

18 Now, we don't require one protection  
19 method over another, but they didn't put a protection  
20 method in there to protect the -- well, RWST is a bad  
21 example because it is not a necessarily one-train  
22 system.

23 But let's say you have both trains being  
24 affected by a fire. And here this is probably what is  
25 the more likely scenario. One train is just going to

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1 be damaged by the fire and not work, and then the  
2 other train is going to have the spurious actuation.

3 We don't necessarily need both trains to  
4 have spurious actuations. So that's the situation.  
5 It doesn't have to be multiple spurious on multiple  
6 trains.

7 MEMBER APOSTOLAKIS: Have we agreed that  
8 the first bullet is not quite correct? We're asking  
9 for more than just information?

10 MR. FRUMKIN: It's clear.

11 MEMBER APOSTOLAKIS: Yes.

12 MEMBER DENNING: It just takes them a lot  
13 of work to do it. I think we all recognize that it's  
14 a request for information, but in order to produce  
15 that information, you have to do a lot of work.

16 MEMBER APOSTOLAKIS: Right. It sounds to  
17 me like the priest saying, you know, "I know you're a  
18 sinner, George. Now, you go away and think of all the  
19 ways in which you could be a sinner and come back and  
20 tell me what they are." I have thought about it.

21 CHAIRMAN WALLIS: It's already been  
22 analyzed.

23 MEMBER APOSTOLAKIS: I protected myself.

24 MEMBER DENNING: Let's go on. And I would  
25 like to hear the conservative risk analysis. And so

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1 would you give us a little presentation on the  
2 conservative risk analysis?

3 MR. FRUMKIN: Are you done with all of  
4 your slides?

5 MEMBER DENNING: Yes.

6 MR. WOLFGANG: Yes. I just want to say  
7 one thing. If we don't issue a generic letter, we'll  
8 have to use the inspection process behind these  
9 problems.

10 It will take longer. We estimate three  
11 triennials, nine years. And some risk-significant  
12 items may be missed. We don't know because the burden  
13 is put on us, instead of the licensee. I just want to  
14 bring it up.

15 MEMBER DENNING: Thank you.

16 MEMBER BONACA: Is it with regard to the  
17 90 days with the responses? I mean, how did you come  
18 up with the 90 days, recognizing that you have to go  
19 to award to provide these responses? Was there an  
20 evaluation that you performed?

21 MR. WOLFGANG: No.

22 MEMBER BONACA: I mean, can it be changed?

23 MR. WOLFGANG: It can be changed. It was  
24 an arbitrary period that we thought was --

25 MEMBER APOSTOLAKIS: Or you can reduce the

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1 requirement.

2 MR. WOLFGANG: Yes, or we can --

3 MEMBER APOSTOLAKIS: So we don't have  
4 these?

5 MR. FRUMKIN: No, you don't have these  
6 slides. We will be making them available.

7 MR. KLEIN: Just as a reminder, if I can  
8 just follow up on the 90-day issue and the comments in  
9 regard to that, we do have a bullet in there that, for  
10 licensees who can't meet that 90-day requirement, that  
11 within the 30 days, they come in and request an  
12 extension.

13 MEMBER MAYNARD: Yes. And I saw that in  
14 the generic letter. If it's a situation where you  
15 know 90 percent of the industry is not going to be  
16 able to do it, you might as well be able to pick a  
17 date where everybody is not having to do it. I'll be  
18 interested in hearing from the industry as to whether  
19 they think that is a burden or not. I think I am  
20 assuming it is, but it may not be. So I don't know.

21 MR. FRUMKIN: This is a bounding risk  
22 analysis for multiple spurious actuations. It was  
23 developed for this meeting by Ray Gallucci, Dr. Ray  
24 Gallucci, who is in the Fire Protection Section. And  
25 it's been presented as a paper for the American

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1 Nuclear Society presentation. I think this winter  
2 they're having a meeting.

3 I am the third string presenter of this  
4 document. Ray is the first string. Dr. Weerakkody is  
5 the second string. And I'm presenting out of  
6 necessity.

7 MEMBER DENNING: Is Ray here to get beaten  
8 upon if he --

9 MR. FRUMKIN: No. Ray is on inspection at  
10 Browns Ferry. So we have --

11 MEMBER APOSTOLAKIS: Last time he was here  
12 he --

13 MEMBER DENNING: No wonder he's at Browns  
14 Ferry.

15 MR. KLEIN: Let me clarify. He's on a  
16 program review at Browns Ferry. He's not on an  
17 inspection.

18 MR. FRUMKIN: Okay. I'm sorry. These  
19 slides will be made available. My understanding of  
20 this analysis is using an older plant PRA that Ray was  
21 involved in, he pulled out some of the important  
22 measures for some hot shorts. And he recombined them  
23 into multiple hot shots and, using a simplification  
24 process, determined a bounding risk analysis for those  
25 based on those important measures for one plant's PSA.

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1           So this is the typical older nuclear power  
2 plant, has a fire CDF of  $3.3^{-5}$ . And they used a hot  
3 short probability of .1. They had modeled 24 of the  
4 basic events. And that contributed about 5 percent to  
5 the fire CDF or  $1.8D^{-6}$ .

6           And then there were some systematically  
7 symmetric redundant train components that were chosen  
8 because I think they had more of a larger impact on  
9 the plant risk if they were to fail together. And  
10 that was a contribution of .03 to the fire CDF, those  
11 10 items.

12           MEMBER DENNING: Let's go slowly so we --

13           MEMBER APOSTOLAKIS: Yes.

14           MEMBER DENNING: -- understand what we  
15 have here.

16           MR. FRUMKIN: Okay.

17           MEMBER APOSTOLAKIS: Twenty-four hot short  
18 basic events above truncation. What does that mean?

19           MR. FRUMKIN: That in the model, the ones  
20 that had remained as important remained having  
21 importance measures in the model, that there were only  
22 24 hot shorts that remained there.

23           MEMBER APOSTOLAKIS: The core damage  
24 frequency due to hot shorts is  $1.8 \cdot 10^{-6}$  per year, it  
25 says.

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1 MR. FRUMKIN: Correct, assuming a hot  
2 short probability of .1.

3 MEMBER APOSTOLAKIS: Which was low.

4 MR. FRUMKIN: Which is low based on  
5 current data.

6 MEMBER KRESS: Okay. So one, it would be  
7 1.8 times  $10^{-5}$ .

8 MR. FRUMKIN: If you said 1.0, correct.

9 MEMBER DENNING: Now, you said that that's  
10 low, but don't forget here that now we're talking  
11 supposedly real nuclear power plants with fires where  
12 you would take into account the fact that the fire may  
13 not damage any cables, you know.

14 MR. FRUMKIN: Right. Well, this is from  
15 an --

16 MEMBER DENNING: Oh, this is --

17 MR. FRUMKIN: -- old fire PSA. So this  
18 does consider --

19 MEMBER DENNING: Yes, it does.

20 MR. FRUMKIN: -- many of those factors.

21 MEMBER DENNING: But saying that the  
22 probability of your hot short is .1 and saying, "Well,  
23 that is low," I think because we saw those other  
24 things where people say, "Well, it could be .6 or .2  
25 or something like that," --

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1 MR. FRUMKIN: Right.

2 MEMBER DENNING: -- and, therefore, this  
3 is low, that doesn't necessarily follow.

4 MR. FRUMKIN: I think this is the  
5 conditional hot short probability based on cable  
6 damage.

7 CHAIRMAN WALLIS: How about multiple  
8 shorts come into this?

9 MR. FRUMKIN: That is what we are going to  
10 be talking about.

11 CHAIRMAN WALLIS: This doesn't address  
12 that?

13 MR. FRUMKIN: No, no. Right. This is  
14 what this analysis is. So assuming that the  
15 components within each pair -- these are those ten  
16 items that have been paired -- have similar failure  
17 characteristics and locations, including their cable  
18 runs, again, this is a conservative assumption and  
19 that these comprise the full set of candidates for  
20 multiple spurious actuations that are not specifically  
21 modeled in the traditional IPEEEs as --

22 MEMBER APOSTOLAKIS: The number you showed  
23 us earlier assumes that these happen independently?

24 MR. FRUMKIN: Yes.

25 MEMBER DENNING: You know, I still don't

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1 understand the pairing. What is going on here? Is it  
2 ten corresponding to --

3 MEMBER APOSTOLAKIS: Ten of these?

4 MEMBER DENNING: Five paired components.

5 That means that there is a --

6 MEMBER APOSTOLAKIS: Redundant elements.

7 MEMBER DENNING: They're redundant  
8 elements.

9 MEMBER APOSTOLAKIS: Yes.

10 MR. FRUMKIN: I believe what they did is  
11 of these 24, they took out 10 of them that could when  
12 combined have an issue.

13 MEMBER APOSTOLAKIS: They are still  
14 located in the --

15 MEMBER DENNING: It could lead to  
16 problems.

17 MR. FRUMKIN: On this slide, they're  
18 independent.

19 MEMBER APOSTOLAKIS: Yes.

20 MR. FRUMKIN: But I think what we're going  
21 to do is we're going to try to take out that and look  
22 at them as pairs. So this is what we're going to do,  
23 form a bounding analysis to estimate the potential  
24 maximum CDF due to multiple spurious actuations for  
25 this typical older MPP, which I think is what the

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1 target, the goal is here.

2 And now we start getting into some  
3 formulas. Per pair, one hot short corresponds to  
4 train A and the other to train B. So that's how they  
5 were paired. And they appear in symmetrically paired  
6 cut sets.

7 So one cut set, the CDF of A -- and  
8 there's the formula for that -- and the CDF of B,  
9 which is the fire initiator, and then the hot short or  
10 random failure of one of the paired components and  
11 then the summation of the B. Okay?

12 CHAIRMAN WALLIS: And where do the  
13 multiple shorts come in?

14 MR. FRUMKIN: This is the formula for --

15 CHAIRMAN WALLIS: It's between two trains,  
16 but it's not multiple shorts in the same cable.

17 MR. FRUMKIN: That's correct, not in the  
18 same cable.

19 CHAIRMAN WALLIS: It's still independent.  
20 And this formula that you have here, the cut sets, are  
21 still assuming that the --

22 MR. FRUMKIN: I think so. They're not  
23 going to be independent of the same fire and the same  
24 damage time, but they're going to be independent  
25 failures affected by the same fire.

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1 MEMBER APOSTOLAKIS: Conditional on the  
2 fire.

3 MR. FRUMKIN: Conditional on the fire.

4 MEMBER SIEBER: Which assumes the fire  
5 covers both things.

6 MR. FRUMKIN: Right, which is a  
7 conservative assumption in this analysis.

8 MEMBER SIEBER: Truly conservative.

9 MR. FRUMKIN: Yes.

10 MEMBER SIEBER: Improbable.

11 MR. FRUMKIN: Well, it depends on the  
12 design of the plant, but yes, it's --

13 MEMBER APOSTOLAKIS: So if I want to  
14 couple them, then, I will assume that Fa and Fb are  
15 just F, one fire. Is that correct? And then I will  
16 have --

17 MEMBER DENNING: A is --

18 MEMBER APOSTOLAKIS: Otherwise they are  
19 still independent. I mean, the fire initiator must be  
20 the same.

21 MR. FRUMKIN: Well, let's just hope that  
22 your answer --

23 MEMBER APOSTOLAKIS: We assume two  
24 different fires.

25 MEMBER DENNING: We'll go to the next

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1 slide. And maybe it will become clear.

2 MEMBER SIEBER: It's a lot clearer in  
3 here.

4 MR. FRUMKIN: Okay. So, again, we have --

5 MEMBER APOSTOLAKIS: This .1 comes from?

6 MR. FRUMKIN: The .1 was the  
7 state-of-the-art when they did this PSA of --

8 MEMBER APOSTOLAKIS: I'll tell you where  
9 it comes from.

10 MR. FRUMKIN: Okay.

11 MEMBER APOSTOLAKIS: That's 20 years or so  
12 ago.

13 MEMBER DENNING: You're responsible for  
14 .1?

15 MEMBER APOSTOLAKIS: I saw it, and I said,  
16 "Well, gee. How did you come up with that?"

17 So they said, "Well, call this guy"  
18 somewhere in California.

19 I called this guy. He says, "Well, you  
20 know Sandia told us that."

21 "What Sandia?"

22 "This person."

23 So I called this person in Sandia. He  
24 says, "Well, I really don't know. It's this other  
25 guy."

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1           So I called this other guy. And he says,  
2 "You told us that."

3           (Laughter.)

4           MEMBER DENNING: So we're going to accept  
5 the .1.

6           MEMBER APOSTOLAKIS: It wasn't followed up  
7 at all. I mean, that was the funniest thing.

8           MR. FRUMKIN: The IPEEE assumed this hot  
9 short probability of .1. And then I believe we're  
10 doing a simplification of these factors here. And it  
11 actually gets very simple on the next slide, but if  
12 anyone really wants me to read through this, I can  
13 try.

14           MEMBER DENNING: You know what we'll do?  
15 Let's go to the bottom line.

16           MR. FRUMKIN: The bottom line.

17           MEMBER DENNING: And we'll have copies of  
18 this.

19           MR. FRUMKIN: Okay. Yes.

20           MEMBER DENNING: And we'll --

21           MR. FRUMKIN: Okay. This is, I believe --  
22 well, let's see.

23           MEMBER APOSTOLAKIS: No. This is --

24           MR. FRUMKIN: This is the bottom line  
25 here.

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1 MEMBER APOSTOLAKIS: Go back a little bit.

2 MR. FRUMKIN: I think --

3 MEMBER APOSTOLAKIS: This Fa plus Fb I  
4 don't understand. I thought it was going to be 1.5.

5 CHAIRMAN WALLIS: That's two fires, isn't  
6 it?

7 MEMBER APOSTOLAKIS: This is one or the  
8 other, yes, one or the other.

9 MR. FRUMKIN: Yes.

10 MEMBER APOSTOLAKIS: It doesn't really --  
11 I mean, he should have assumed one fire as far as I  
12 can tell. But, again, the --

13 MEMBER DENNING: We will look at it  
14 carefully.

15 MEMBER APOSTOLAKIS: -- connection is  
16 nothing, I mean, right?

17 MEMBER DENNING: We will look at it  
18 carefully later.

19 MR. FRUMKIN: Right. That would be a  
20 small difference.

21 MEMBER DENNING: And Ray's bottom line  
22 again is?

23 MR. FRUMKIN: Okay. Well, what he does  
24 here is he's taking out the  $1.1E^{-6}$ . And he's putting  
25 in this value or coming up with this value of .011,

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1 which is his surrogate simplification for all of the  
2 fires and his X factor, which is his fire and his  
3 failure factor.

4 MEMBER APOSTOLAKIS: He's bounding the  
5 random failures, right, by assuming a  $10^{-3}$ , right?

6 MR. FRUMKIN: I believe so.

7 MEMBER APOSTOLAKIS: Yes.

8 MR. FRUMKIN: Typical, right.

9 MEMBER APOSTOLAKIS: But he doesn't know  
10 how many -- oh, this is a bound on all random failures  
11 that are required.

12 MR. FRUMKIN: Yes.

13 MEMBER DENNING: Continue. Let's see.

14 MR. FRUMKIN: Okay. And now he's talking  
15 about the dual failures. Any of the ten paired hot  
16 shorts would appear in the cut sets. And Fa is the S,  
17 which is your severity factor, which going to reduce  
18 your likelihood of more hot shorts, which is the  
19 likelihood of having a big fire that's going to cause  
20 this damage.

21 CHAIRMAN WALLIS: Which affects both  
22 trains?

23 MR. FRUMKIN: Right. And then your  
24 various factors, A hot, B hot short, and then your  
25 random factors.

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1 MEMBER APOSTOLAKIS: Why square? Why A  
2 hot times A hot? It still assumes that they're  
3 independent events, right?

4 CHAIRMAN WALLIS: Well, that is the A hot  
5 times B hot --

6 MEMBER DENNING: It is going to take us  
7 some time to really work through this. Rather than do  
8 this here, --

9 MR. FRUMKIN: Okay.

10 MEMBER DENNING: -- let's go see Ray's  
11 bottom line.

12 MR. FRUMKIN: Okay. The bottom line is  
13 here.

14 MEMBER APOSTOLAKIS: All right.

15 MR. FRUMKIN: So for his choice of fires,  
16 for severity factor, I think he used a .1 for this  
17 extreme fire, which is an S.

18 CHAIRMAN WALLIS: Why is .1 extreme? It  
19 could be .5.

20 MR. FRUMKIN: Oh, no, no, no. This is for  
21 the likelihood of a large fire.

22 CHAIRMAN WALLIS: Yes. But just asking  
23 George Apostolakis by telephone tag --

24 MR. FRUMKIN: Oh, no. This is not his .1.

25 CHAIRMAN WALLIS: I thought it was his .1.

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1 MR. FRUMKIN: It's somebody else's .1.

2 MEMBER APOSTOLAKIS: This is from one of  
3 my students.

4 MR. FRUMKIN: That's right. Right. This  
5 .1 is from very likely the fire protection STP, which  
6 says that severe fires happen or ten percent of all  
7 fires that happen are severe, which is, again, a  
8 conservative number based on the state-of-the-art,  
9 which is the 6850 analysis.

10 But that's what we're doing with -- I  
11 mean, this is no question about it. This is a  
12 bounding analysis.

13 CHAIRMAN WALLIS: The ones that cause hot  
14 shorts?

15 MR. FRUMKIN: No. Instead of using a  
16 severity factor of one, assuming that all fires will  
17 cause the damage, we're only assuming that ten percent  
18 of the fires will cause the damage to cause hot short.  
19 So there are many different ways of severity --

20 MEMBER APOSTOLAKIS: So this .011, .011,  
21 is the frequency of fire or, no, this is from the  
22 random failure?

23 MR. FRUMKIN: Right.

24 MEMBER APOSTOLAKIS: According to one is  
25 one?

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1 MR. FRUMKIN: That's the severity factor.

2 MEMBER APOSTOLAKIS: What is the frequency  
3 of fire?

4 MR. FRUMKIN: What I believe he has done  
5 is I believe he has back-calculated through his  
6 simplification that .1 that he used. And he's turned  
7 that, the whole -- all of his important measures into  
8 this .011.

9 MEMBER APOSTOLAKIS: So that includes the  
10 frequency of fire?

11 MR. FRUMKIN: I believe so.

12 MEMBER APOSTOLAKIS: That's a pretty high  
13 number.

14 MR. FRUMKIN: Yes.

15 MEMBER DENNING: We are going to look at  
16 this carefully, but his bottom line is saying, well,  
17 what this could do in this particular case is it could  
18 have increased by a factor of three the fire damage  
19 frequency.

20 MR. FRUMKIN: I think what he's trying to  
21 say here is that when he back-calculates from his  
22 importance measures and then he combines these pairs,  
23 that -- and this is the bottom line here -- he can  
24 have a maximum of  $10^{-4}$  per year due to these pairs of  
25 hot shorts.

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1 MEMBER DENNING: And without it, they had  
2 3 times  $10^{-5}$  is what this plant did.

3 MR. FRUMKIN: Yes. That's the whole fire  
4 risk for the plant, is 3 times  $10^{-5}$ . So this could be  
5 dominating.

6 MEMBER APOSTOLAKIS: But why couldn't you  
7 go to an actual PRA and fix, instead of whatever they  
8 had, and see what happens, rather than doing this  
9 undue analysis? I mean, there are detailed fire PRAs  
10 out there.

11 MR. FRUMKIN: We don't actually have one  
12 in the office. He did have this information available  
13 to him.

14 MEMBER DENNING: What I would like to do  
15 is we would definitely like copies. Don't go  
16 anywhere.

17 MR. FRUMKIN: Okay.

18 MEMBER DENNING: And I don't think you  
19 have to read that. What we would like -- I mean, you  
20 can actually --

21 MR. FRUMKIN: Well, here his last slide is  
22 at least for a typical older nuclear power plant, one  
23 cannot a priori dismiss multiple hot shorts of being  
24 of lower significance.

25 MEMBER DENNING: Okay.

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1 MEMBER APOSTOLAKIS: Well, I would like to  
2 see the paper, please. No, no. Give me a copy.

3 MEMBER DENNING: Right. Yes, if we may.  
4 What we would like to do now is we would like to hear  
5 now from NEI, if we could. Don't run away, Research.

6 MEMBER APOSTOLAKIS: Don't anybody go  
7 away.

8 MEMBER DENNING: Don't anybody leave town  
9 other than me, but I would definitely like to make  
10 sure we have plenty of time to hear from NEI.

11 MEMBER APOSTOLAKIS: That's what I call  
12 running and meeting with --

13 MEMBER DENNING: The policeman is asked to  
14 lock the doors.

15 MEMBER APOSTOLAKIS: We have a cop  
16 outside?

17 MEMBER DENNING: And, Alex, you don't have  
18 handouts, but we can make them. Is that a true  
19 statement?

20 MR. MARRION: No, I do not have handouts.  
21 I do have a couple of comments.

22 MEMBER DENNING: You have comments?

23 MR. MARRION: Yes.

24 MEMBER DENNING: But you don't have any  
25 papers?

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1 MR. MARRION: No.

2 MEMBER DENNING: Okay. Please proceed.

3 MR. MARRION: Good morning. My name is  
4 Alex Marrion. I am a Senior Director of Engineering  
5 at NEI, and I appreciate the opportunity to offer a  
6 couple of comments on our perspectives on what we  
7 heard this morning.

8 Before I begin, I want to point out that  
9 we have two utility representatives, one from Progress  
10 Energy and one from Duke Power, who represent the two  
11 pilot plants for the application of NFPA 805.

12 And if the Committee so desires, I think  
13 it may be useful for you to understand the  
14 implications of this generic letter on the NFPA 805  
15 risk-informed application process. And I'll defer to  
16 you to --

17 MEMBER DENNING: We so desire.

18 MR. MARRION: Okay. Very good. Now I'll  
19 ask them to step up when I finish my comments.

20 To get back to Dr. Apostolakis' --  
21 George's comment, --

22 (Laughter.)

23 MR. MARRION: -- the test protocol and the  
24 issue of having cables exposed in the flaming region,  
25 I don't have any direct knowledge of that discussion

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1 with the NRC staff at the time we developed the test  
2 protocol. This was the first I heard of it, but I'll  
3 look into it. And we'll try to get an answer to you  
4 at the end of the week.

5 I do want to make it clear that we believe  
6 the multiple spurious actuation is a new regulatory  
7 position that results in significant impact on utility  
8 licensees, not only on the Appendix R, the NUREG 0800  
9 plants but also on the NFPA 805 plants.

10 The impact is significant in that it  
11 changes the methodologies that the utilities have  
12 credited in their licensing basis over the last 20  
13 years. So the licensing basis has to change.

14 Now, with that, it's perfectly appropriate  
15 for the NRC to say, "There's new information that has  
16 been brought to bear on this topic. And we have a new  
17 position." That's fine. But the NRC must bear the  
18 burden of demonstrating the safety impact of that new  
19 position and do a regulatory analysis to substantiate  
20 it because of the significant implications on the  
21 utility licensee design basis.

22 That's straightforward, but one thing that  
23 this position does not take into account is the  
24 fundamental elements of defense-in-depth relative to  
25 fire protection. What I'm talking about is the

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1 actions that are taken by licensees in preventing  
2 fires from occurring and detecting a fire when it does  
3 occur, having systems and personnel to respond to the  
4 fire to mitigate the consequences of the fire,  
5 suppression and detection systems, and then ultimately  
6 recovering the plant to assure that you can get into  
7 a safe condition.

8 We understand there is value to looking at  
9 risk-informed approaches and changes and assumptions  
10 and evaluating them accordingly, but I would recommend  
11 that we not lose sight of the defense-in-depth  
12 concepts as we go through this process going forward.

13 This generic letter is another example of  
14 what is fundamentally flawed with fire protection  
15 regulations and has been a problem with fire  
16 protection regulations and the associated regulatory  
17 process over the last 25 or 35 years.

18 And by that, I mean we have a continuous  
19 evolution of NRC positions and expectations that are  
20 addressed in a somewhat informal manner. And by that,  
21 I mean use of generic communications to articulate  
22 regulatory positions is, quite frankly, inappropriate.

23 New regulatory positions should be  
24 evaluated in terms of safety impact or clearly  
25 demonstrating the compliance issue associated with

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1 that new position. Then that has to be made publicly  
2 available so that the licensees can understand what  
3 these new positions are and what the basis for the  
4 positions are.

5 Historically in fire protection, it's been  
6 a plant-specific fire protection engineer from the  
7 licensee to an NRC inspector agreement of what the  
8 understanding is relative to an interpretation. And  
9 that is the problem that we're trying to fix. That's  
10 why we are so firm in our comments going forward,  
11 because fundamentally, gentlemen, if we don't address  
12 or we don't identify resolution to the spurious  
13 actuation issue today, it will be an issue for the  
14 NFPA 805 plants.

15 Going to 805 does not provide a resolution  
16 to this issue today because there is no understood  
17 methodology that can address the staff's position. I  
18 want to make that very clear.

19 MEMBER APOSTOLAKIS: Is this the  
20 open-ended issue that we discussed earlier?

21 MR. MARRION: Yes, yes. The comments made  
22 about CRGR approval of this generic letter, as an  
23 external stakeholder, that essentially is meaningless  
24 to us, reason being we are not privy to any kind of  
25 disciplined process that is used by CRGR or anyone

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1 within the NRC that clearly demonstrates this is the  
2 basis for the safety concern or this is the basis for  
3 the compliance concern.

4 What we have seen over the years -- and  
5 this is another example -- where the preferred route  
6 appears to be, well, let's make it a compliance  
7 concern because we as a regulatory agency, the NRC,  
8 can interpret the regulations. We have the right to  
9 interpret the regulations, et cetera, which is fine,  
10 but let's put the interpretation on paper. Let's  
11 identify resolution path so we have a common  
12 understanding going forward. We don't have that today  
13 on this particular issue.

14 Lastly, I would like to say that there  
15 isn't a generic letter that is simply a request for  
16 information. It should be clear from the discussion  
17 this morning that this generic letter basically  
18 imposes a new regulatory requirement that has  
19 significant impact on the licensing basis of current  
20 plants. That is not a request for information.

21 Those are the comments that I wanted to  
22 make this morning. I don't know if you have any  
23 questions on anything I said.

24 MEMBER DENNING: Yes, we do have some.  
25 One of them has to do with the timing, the 90 days,

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1 and the timing required to do the kind of analysis  
2 that's being requested there. Do you have a feeling  
3 as to what an appropriate time would be?

4 I mean, there's a timing that says, are  
5 you in compliance with this, which, regardless of this  
6 question, whether it's a new regulation or an old,  
7 there's no question the plant can determine that  
8 fairly quickly. But doing the entire analysis and  
9 determining what affected SSCs are, do you have any  
10 indication from the plants as to how much time that  
11 might take and what an appropriate time frame would be  
12 for a response like --

13 MR. MARRION: I don't have the information  
14 to answer the question, but I would submit that the  
15 next two individuals may be able --

16 MEMBER DENNING: May be of help on it?

17 MR. MARRION: -- to give you their  
18 perspectives.

19 MEMBER DENNING: Okay. Good.

20 MEMBER MAYNARD: Could I just --

21 MEMBER DENNING: Yes?

22 MEMBER MAYNARD: Your perspective comment  
23 was made that if the generic letter is not issued,  
24 then it would just have to be dealt with in inspection  
25 space. Do you have any comment on that?

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1 MR. MARRION: It is being dealt with in  
2 inspection space. Now, what we don't have is an  
3 external stakeholder. When I mention "we," I'm  
4 speaking of NEI and the industry. What is the safety  
5 case or what is the compliance case? And we haven't  
6 seen evidence of that clearly demonstrated that NRC  
7 action in this particular area is necessary in an  
8 expedited manner.

9 VICE CHAIRMAN SHACK: Just to address your  
10 methodology question, apparently you can deal with  
11 multiple actions if they come sequentially. So you  
12 have a methodology for that. And you're arguing that  
13 there isn't a methodology.

14 So it isn't necessarily the open-endedness  
15 of it that's the problem?

16 MR. MARRION: There isn't a methodology  
17 for addressing all spurious actuations in a given  
18 fire. Utilities had --

19 VICE CHAIRMAN SHACK: You can address them  
20 one at a time.

21 MR. MARRION: You can address them one at  
22 a time. And I would ask that the two utility  
23 representatives explain their methodology for circuit  
24 analysis. I think we would find that very insightful.

25 MEMBER DENNING: Good.

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1 MR. MARRION: But it's changed. And then  
2 what I would like to do is ask Dave Miskiewicz from  
3 Progress Energy and Harry Barrett from Duke Power.

4 CHAIRMAN WALLIS: I would bring up the  
5 point before you leave --

6 MR. MARRION: Yes?

7 CHAIRMAN WALLIS: You talked about the  
8 role of a generic letter and whether it just requests  
9 information. We have another generic letter on sumps,  
10 which you may be aware of, right?

11 MR. MARRION: I am generally aware of that  
12 one.

13 CHAIRMAN WALLIS: It not only requested  
14 information. It requested analysis, and it requested  
15 plans. And, in fact, it's resulted in large changes  
16 in the plant by a result of a generic letter.

17 MR. MARRION: Yes.

18 CHAIRMAN WALLIS: So it's not as if this  
19 is a unique generic letter, which is actually asking  
20 plants to do much more than just supply information.

21 MR. MARRION: My only point is a request  
22 for information as this generic letter is  
23 characterized as a mischaracterization of what its  
24 impact is.

25 CHAIRMAN WALLIS: Well, it clearly isn't

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1 that. I mean, it says a request for information and  
2 taking additional actions. I mean, the sentence asks  
3 for more than just information.

4 MR. MARRION: Okay?

5 MEMBER DENNING: Okay. Let's have our  
6 visitors come up.

7 MR. FRUMKIN: If I could add? This is Dan  
8 Frumkin. Just one point. The inspections started  
9 again in January of 2005, but there is still currently  
10 enforcement discretion for all circuit findings. And  
11 so there may be a perception that this has not turned  
12 into an issue yet because of a lack of enforcement in  
13 this area.

14 So starting in September 2006, enforcement  
15 will proceed for plants that do not have enforcement  
16 discretion under NFPA 805. So I just want to put that  
17 out there that currently there are no enforcement  
18 actions in this area for plants that take compensatory  
19 measures and have correction action plans.

20 MEMBER DENNING: Introduce yourselves,  
21 please.

22 MR. BARRETT: Good morning. My name is  
23 Harry Barrett. I work at Duke Power. I'm the  
24 three-site lead for NFPA 805 transition for all three  
25 of these sites in Duke Power's nuclear fleets. I just

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1 wanted to say a few words about the multiple spurious  
2 issue as it affects 805.

3           Although 805 is a risk-informed,  
4 performance-based rule, it is based on your current  
5 licensing basis going forward. And if that is  
6 questionable, then your regulatory foundation that  
7 you're billing it on would be questionable in 805,  
8 which ends up leading to a lot more effort and a lot  
9 more analysis required for that.

10           So this multiple spurious issue is adding  
11 a significant amount of paperwork and analysis to 805  
12 transition. The original concept was you would take  
13 your fire protection licensing basis, map it over to  
14 the 805 requirements, and it was pretty much just a  
15 paper transition.

16           With this new multiple spurious and the  
17 complications that that adds to the fire PRA, we're  
18 looking at a significant amount of engineering effort  
19 that goes into that.

20           It's going to take us over two years to do  
21 the transition for Oconee, which is the first plant.  
22 And a lot of that, most of that, is the PRA in the  
23 multiple spurious issue.

24           MEMBER APOSTOLAKIS: Do you agree that it  
25 is an issue?

1 MR. BARRETT: I agree that it needs to be  
2 looked at. I have not seen a multiple spurious  
3 scenario that is risk-significant yet.

4 MEMBER APOSTOLAKIS: Do any of your plant  
5 have a detailed fire PRA?

6 MR. BARRETT: We have a fire PRA. We have  
7 --

8 MEMBER APOSTOLAKIS: Not IPEEE, though?

9 MR. BARRETT: We had an early '80s vintage  
10 fire PRA, but we are putting together a NUREG 6850,  
11 the new version of it.

12 MEMBER APOSTOLAKIS: Okay. So --

13 MR. BARRETT: We're doing that now.

14 MEMBER APOSTOLAKIS: It would be, then,  
15 possible for you to go back to that PRA and see what  
16 happens if you assume multiple --

17 MR. BARRETT: It assumed multiple in the  
18 original analysis. To use the core melt, we needed to  
19 use multiples for that particular analysis. So it  
20 included --

21 MEMBER APOSTOLAKIS: The number came out  
22 okay?

23 MR. BARRETT: It came out relatively high.  
24 I don't remember the exact number, but fire was a  
25 fairly significant contributor to risk in the --

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1 MEMBER APOSTOLAKIS: Not fire overall,  
2 but, I mean, this particular mode with --

3 MR. BARRETT: Spurious?

4 MEMBER APOSTOLAKIS: Yes.

5 MR. BARRETT: If I remember right, many of  
6 the combinations that we analyzed were within the  
7 bounds of the Appendix R analysis originally for  
8 control room evacuation. The main fire area that we  
9 got into trouble with the IPEEE or the fire PRA, the  
10 original one, was in our cable shaft going up to the  
11 control room, where we had just about every cable in  
12 the plant going through one area. And so --

13 MEMBER APOSTOLAKIS: It seems to me that  
14 --

15 CHAIRMAN WALLIS: Did you assume multiple  
16 spurious actuations, simultaneous, and all of this?

17 MR. BARRETT: In that particular PRA, we  
18 ended up having to go to multiple spurious actuations  
19 in order to get the core damage.

20 CHAIRMAN WALLIS: Okay. Including  
21 simultaneous actuations.

22 MEMBER APOSTOLAKIS: So it would be  
23 interesting, then, to compare your numbers and  
24 analysis with the bounding analysis that the NRC staff  
25 has done to see which one makes sense.

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1 I mean, it seems that we do have a body of  
2 knowledge there that at least I as a member of this  
3 Committee don't seem to have access to. I don't know  
4 whether the rest of the members are familiar with it,  
5 but I doubt it.

6 So, I mean, it would be nice to see that,  
7 especially since you have done it already, I mean.

8 MR. BARRETT: Yes. The original analysis  
9 was nowhere the rigor that 6850 requires now.

10 MEMBER APOSTOLAKIS: I understand that.  
11 I mean, you --

12 MEMBER SIEBER: It is just one plant. So  
13 it's not clear to me how you can extend that to some  
14 --

15 MEMBER APOSTOLAKIS: Yes. But it provides  
16 a basis for judging what Ray Gallucci did.

17 MEMBER SIEBER: It gives you an idea.

18 MEMBER APOSTOLAKIS: Yes. And also what  
19 kind of effort it takes to do it because under NFPA  
20 805, it seems to me that if you find -- as I recall.  
21 Maybe I'm wrong. As I recall, you're right. You're  
22 supposed to meet the regulations, but if you don't  
23 meet some of them, then you can argue in risk space.

24 MR. BARRETT: Right.

25 MEMBER APOSTOLAKIS: Right?

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1 MR. BARRETT: Right.

2 MEMBER SIEBER: You don't need to.

3 MEMBER APOSTOLAKIS: But you don't need to  
4 go back and comply. So, I mean, there is a way out of  
5 it depending on the quality of the risk assessment.

6 MEMBER SIEBER: That would be a basis for  
7 an exemption, but you can't just sit there and do  
8 nothing.

9 MEMBER APOSTOLAKIS: But is that  
10 consistent with a statement that it does a lot of  
11 work, paperwork? I mean, if you already have the PRA,  
12 why does it add a lot of work? But you just said  
13 that, right?

14 I'm sorry. I don't remember your name.

15 MR. BARRETT: Harry.

16 MEMBER SIEBER: The PRA is not  
17 state-of-the-art.

18 MR. BARRETT: Right. The original PRA is  
19 not state-of-the-art.

20 MEMBER SIEBER: They have to do the work.

21 MR. BARRETT: The one that they are doing  
22 now is state-of-the-art. They're using 6850 and --

23 MEMBER APOSTOLAKIS: When do you expect it  
24 to be completed?

25 MR. BARRETT: It should be complete by

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1 probably June of next year.

2 VICE CHAIRMAN SHACK: When you do your  
3 state-of-the-art PRA, you're going to consider  
4 multiple actuations, right?

5 MR. BARRETT: Yes.

6 MEMBER APOSTOLAKIS: Yes. So, I mean, is  
7 it clear to everyone? I mean --

8 MR. BARRETT: We are taking significant  
9 efforts to make sure we get our best chance at finding  
10 those multiple spurious risk --

11 VICE CHAIRMAN SHACK: But it seems to me  
12 that anybody doing a fire PRA is going to have to  
13 consider multiple --

14 MEMBER DENNING: Do they have to consider  
15 them as comprehensively as here? Because they will  
16 have screening criteria. And I guess can you tell me  
17 if you weren't -- you know, suppose you were not  
18 heading towards that.

19 If you are sitting there and you had to do  
20 this analysis, how long would it take you to do this  
21 analysis? And how difficult would it be to -- would  
22 you have to modify the plant to be able to accommodate  
23 it?

24 MR. BARRETT: I am not sure about that.  
25 What we would probably end up doing is using the

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1 guidance in NEI-0001, chapter 4, which is the risk  
2 analysis piece of that, which is, in essence, doing a  
3 mini PRA for the --

4 MEMBER DENNING: But you're not allowed to  
5 use that. I mean, by this generic letter, you're only  
6 allowed to do that if you're then going to look for  
7 exemptions.

8 MR. BARRETT: Right, yes. You're not  
9 doing 805. That's your only other --

10 MEMBER DENNING: Yes.

11 MR. BARRETT: I mean, you need to modify  
12 the plant or you --

13 MEMBER DENNING: Modify the plant. How  
14 long would it take you to do that analysis in --

15 MR. BARRETT: Guessing, I would say  
16 probably a year.

17 MEMBER DENNING: Probably a year. I mean,  
18 what is in here says 90 days.

19 MR. BARRETT: No way.

20 MEMBER DENNING: There's no way?

21 MR. BARRETT: No way.

22 MEMBER DENNING: You would think that --

23 MEMBER SIEBER: Well, you can tell in 90  
24 days roughly how long you think it's going to take you  
25 to do it.

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1 MEMBER DENNING: Absolutely.

2 MEMBER SIEBER: But that's not what  
3 they're asking.

4 MEMBER DENNING: But that's not what  
5 they're asking.

6 MR. BARRETT: I mean, your choices are to  
7 take your safe shutdown analysis and just say that  
8 everything in a given fire areas fails immediately.

9 MEMBER SIEBER: That is the way you used  
10 to do it.

11 MR. BARRETT: And you can't do it.

12 MEMBER SIEBER: No.

13 MR. BARRETT: I mean, with the acceptance  
14 criteria you have in Appendix R, having water level go  
15 out of the pressurizer, you can do that with just a  
16 couple of spurious actuations. If you do all of them,  
17 you're never going to make it. So I don't know how  
18 you do that in 90 days.

19 MR. WOLFGANG: This is Bob Wolfgang with  
20 again --

21 MEMBER DENNING: Go ahead, Bob.

22 MR. WOLFGANG: The 90 days, what we have  
23 currently in the generic letter is for functionality  
24 assessment. To submit any exemption requests,  
25 amendment requests, that's the six-month period.

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1 MEMBER DENNING: Yes, but what I am  
2 missing is to do the functionality assessment, don't  
3 you have to do basically the analysis?

4 MR. BARRETT: Yes. That is essentially an  
5 operability assessment. Are components operable? In  
6 order to know that, you have to do the analysis to  
7 know what gets damaged and when. There's no way  
8 you're going to do that in a short time, no way.

9 MEMBER DENNING: Dave, did you want to  
10 make some comments?

11 MEMBER SIEBER: Before we switch, one  
12 thing that you said that I think is important is you  
13 really can't get the core damage unless you have  
14 multiple spurious actuations.

15 MR. BARRETT: We have some singles that  
16 get us in trouble, and we're going to have to fix  
17 those. But as far as getting into the core damage,  
18 I'm not even sure --

19 MEMBER SIEBER: This would be opposing  
20 trains, too, right?

21 MR. BARRETT: Well --

22 MEMBER SIEBER: Train A, train B pairs.

23 MR. BARRETT: By the fire PRA methodology,  
24 you're really not even worrying about 3G2 or 3G3  
25 anymore. You're looking at fires anywhere and damage

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1 to all of the circuits.

2 MEMBER SIEBER: Right.

3 MR. BARRETT: So you're really looking at  
4 controlling fires and cable room fires and all of  
5 that. And, you know --

6 MEMBER SIEBER: But if you were to make  
7 the assumption that you only have one spurious  
8 actuation, you wouldn't get the core damage. And you  
9 could just say, "I don't need to do anything," right?

10 MEMBER APOSTOLAKIS: Well, it depends on  
11 what else fails.

12 MR. BARRETT: Yes. I think it depends  
13 largely on --

14 MEMBER SIEBER: It would be an on-fire --

15 MR. BARRETT: -- what other failures --

16 MEMBER SIEBER: -- a non-fire-induced  
17 failure, right?

18 MEMBER DENNING: There has to be a core  
19 damage frequency, though. I mean, when you said you  
20 wouldn't get core damage frequency with a single  
21 failure, you have to because you have other unrelated,  
22 but it's just very low.

23 MR. BARRETT: Also we are talking hot  
24 shorts here, but you also have fire-related damage,  
25 which takes the component out of service, which is not

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1 included in that spurious operation probability.

2 So it's a much more complicated things to  
3 get your arms around as far as loss of all electrical  
4 power, loss of indication, and all of that. It's more  
5 than that.

6 MEMBER DENNING: Yes?

7 MEMBER SIEBER: Thanks.

8 MEMBER DENNING: Dave?

9 MR. WOLFGANG: Excuse me.

10 MEMBER DENNING: Yes?

11 MR. WOLFGANG: This is Bob Wolfgang again.

12 So Duke's response to this generic letter  
13 would be we're addressing it. We're transition to  
14 NFPA 805. And we're going to address multiple  
15 spurious actuations in that transition.

16 MR. BARRETT: Yes, sir.

17 MR. WOLFGANG: And that is the total  
18 response we're looking for from --

19 MR. BARRETT: We will give you a schedule  
20 of when we think that will be done, yes.

21 MEMBER DENNING: Okay. If that is what  
22 you are asking for, you're going to have to change the  
23 generic letter.

24 MR. BARRETT: No.

25 MEMBER DENNING: My interpretation. Well,

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1 we'll look at that.

2 Dave, why don't you go ahead and say a few  
3 words?

4 MR. MISKIEWICZ: Okay. My name is Dave  
5 Miskiewicz. I'm from Progress Energy. I'm the lead  
6 PRA supporting the transition to 805 at all of our  
7 units.

8 MEMBER APOSTOLAKIS: PRA?

9 MR. MISKIEWICZ: I'm the lead PRA engineer  
10 supporting our transition.

11 MEMBER APOSTOLAKIS: I thought you said  
12 "elite."

13 (Laughter.)

14 MR. MISKIEWICZ: That does sound good.

15 A lot of the discussion I'm hearing, my  
16 perspective is probably a little bit different than  
17 the normal compliance.

18 MEMBER APOSTOLAKIS: That's why we want  
19 it.

20 MR. MISKIEWICZ: You know, there is  
21 uncertainty. And I am used to dealing with the  
22 uncertainty as how much probability I can assign to  
23 something, can I take credit for these actions and all  
24 the various things on there.

25 One of the things that strikes me is when

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1 I look at the bounding analysis and it seems like  
2 we're trying to get the best of both worlds. We want  
3 to address everything in totality and also assure that  
4 we don't have that risk.

5 You know, when I deal with traditional  
6 design basis, we are allowed one single failure. And  
7 we assume no off-site power. And we give an  
8 initiating event that happens, and that is a given.

9 PRA, we will look at multiple failures.  
10 And we may find things that are more vulnerable that  
11 weren't even addressed under compliance. And I see  
12 kind of a similar thing here except for instead of  
13 saying, "Address a single failure," we're looking at  
14 "You've got to find them all."

15 And that just seems like an impossible  
16 task. Even in the PRA world, we can model a lot of  
17 stuff, but we're still not going to get them all. But  
18 we try to find the significant things. We're trying  
19 to gear down to get the significant issues.

20 As far as the workload goes that I see on  
21 the generic letter, I think it would be significant.  
22 I'm not the circuit analysis person but when I start  
23 throwing in non-currently credited equipment into that  
24 list that I want circuits routed for and cables routed  
25 for, it is a big workload for the electrical guys who

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1 are going to be doing that work. And I would see that  
2 as a resource drain on the overall transition effort  
3 for me.

4 In fact, if I saw them, you know, all of  
5 a sudden, focusing on one area and not another area,  
6 I'm not even sure how they would be able to get all of  
7 them without doing the PRA perspective.

8 MEMBER APOSTOLAKIS: I am a little bit --  
9 I don't know what the right word is, but we keep  
10 talking about the workload. It seems to me we should  
11 be talking about the real issue.

12 Is there a real issue here? Is there a  
13 contributor to risk that we have not handled in the  
14 past or managed well? I mean, the workload I'm sure  
15 you will agree, too, it's a major contributor to risk.  
16 We have to do something about it.

17 MR. MISKIEWICZ: I agree.

18 MEMBER APOSTOLAKIS: And, you know, the  
19 thing that made me happy with Duke is that they are  
20 doing the PRA. They will consider the multiple hot  
21 shorts or spurious situations. Is your company doing  
22 something similar or --

23 MR. MISKIEWICZ: We are doing the PRA.  
24 And we're going to in the PRA model the hot shorts,  
25 the spurious actuations.

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1 MEMBER APOSTOLAKIS: According to the  
2 latest information we have and everything?

3 MR. MISKIEWICZ: When we say important,  
4 too, it's almost, you know --

5 MEMBER APOSTOLAKIS: You're not going to  
6 use .1? You're going to use .6, for example?

7 MR. MISKIEWICZ: We'll use whatever the  
8 methodology recommends.

9 MEMBER BONACA: You can go to Professor  
10 Apostolakis if you remember.

11 MEMBER APOSTOLAKIS: Give me a call. I'll  
12 tell you.

13 (Laughter.)

14 MR. MISKIEWICZ: It's .1. And we're  
15 working through those issues, but even doing that is  
16 going to be limited somewhat. You know, there are  
17 screening techniques and things used that we're going  
18 to work our way through as to which circuits really  
19 need to be evaluated.

20 MEMBER DENNING: Do you think the approach  
21 is clearly defined as to how you come up with a  
22 probability for these actuations?

23 MR. MISKIEWICZ: Right.

24 MEMBER DENNING: There is some randomness  
25 that one assumes in terms of which circuits can

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1 connect with which other circuits to --

2 MR. MISKIEWICZ: I think what we know now  
3 is better than what we knew ten years ago when we were  
4 dealing with this.

5 MEMBER DENNING: Yes. But it isn't  
6 obvious to me even what the best approach is to doing  
7 that within the fire PRA, let alone deterministically.

8 MEMBER APOSTOLAKIS: So the position,  
9 then, of at least you two gentlemen and maybe the  
10 industry is that this generic letter is unnecessary,  
11 that you are handling the issue of multiple spurious  
12 actuations via the PRA and as you transition to it --  
13 are you transitioning to 805?

14 MR. MISKIEWICZ: Yes, we are.

15 MEMBER APOSTOLAKIS: As you transition to  
16 805, you may have to come back to the NRC and, using  
17 risk arguments, request an exemption of some sort. Is  
18 that your position?

19 MEMBER BONACA: Well, I heard it  
20 differently.

21 MEMBER APOSTOLAKIS: What?

22 MEMBER BONACA: I heard it differently.  
23 I heard simply that the burden should be on the NRC to  
24 perform. Okay.

25 MEMBER APOSTOLAKIS: But they are handling

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1 it already.

2 MEMBER BONACA: Yes.

3 MR. BARRETT: We are handling multiple  
4 spurious in the PRA as part of the 805 transition.

5 MEMBER APOSTOLAKIS: And then what?

6 MR. BARRETT: And then we're going to  
7 follow the industry guidance and the regulatory  
8 guidance provided by the NRC. And depending upon  
9 where the thresholds fall in relation to the  
10 self-approval thresholds, if it's less than the  
11 self-approval threshold, then we'll end up  
12 self-approving an exemption in accordance with the NRC  
13 rules for 805 implementation.

14 MEMBER APOSTOLAKIS: Right, right.

15 MR. BARRETT: If it's over that threshold,  
16 then we'll end up having to --

17 MEMBER APOSTOLAKIS: Come back.

18 MR. BARRETT: -- contact the staff and  
19 work out whether we have to modify or whether we can  
20 leave the situation as is.

21 MEMBER APOSTOLAKIS: The conclusion one  
22 can draw from this is that you believe that this  
23 generic letter is unnecessary because there is already  
24 a process in place. Is that correct?

25 MR. BARRETT: For 805, for their plants.

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1 Not everyone is --

2 MEMBER APOSTOLAKIS: Why wouldn't another  
3 plant apply the same thing?

4 MEMBER SIEBER: It is an optional process.  
5 Some plants --

6 MEMBER APOSTOLAKIS: Oh, they don't --

7 MEMBER SIEBER: -- may decide not to do  
8 anything at all.

9 MEMBER APOSTOLAKIS: If they don't  
10 transition to 805, you mean?

11 MEMBER SIEBER: Yes.

12 MR. MARRION: If I may, Dr. Apostolakis,  
13 there are 40 plants that have submitted letters of  
14 intent to the NRC. The resolution of this issue for  
15 the 805 plans has yet to be determined. The approach  
16 is the use of the PRA, do the modeling -- all right?  
17 -- and then define that.

18 But that would be applicable to those 40  
19 plants. The other plants, the balance of the  
20 industry, have used any combination of the single  
21 failure to three or four failures.

22 You heard mention of NEI-001 that has the  
23 methodology, both -- two methodologies: deterministic  
24 and risk-informed. We piloted that at two plants.

25 And so we can't take credit for that

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1 anymore because of this new position with the generic  
2 letter. But I suspect that the solution will be had  
3 with the pilot exercise over the next several months  
4 to a year possibly and that that's the solution that  
5 needs to be evaluated for applicability to the non-805  
6 plants because, absent that, I don't see anyone coming  
7 up with a generic solution for the non-805 plants  
8 today. And it is going to be based upon PRA.

9 MR. MISKIEWICZ: Even in 805, though, when  
10 we do a fire PRA, there will be some iterative  
11 process. You know, we're dependent on the circuit  
12 analysis people giving us the information that we need  
13 to model. And so we're going to try to get risk to  
14 make sure we're modeling the right areas.

15 MEMBER SIEBER: Just the basic methodology  
16 of PRAs causes you to consider multiple spurious --

17 MR. MISKIEWICZ: If you model all of your  
18 singles and multiples from singles --

19 MEMBER SIEBER: That's the way it is.

20 MEMBER APOSTOLAKIS: But in the old days,  
21 in the first PRAs, I don't think we considered that.

22 MR. MISKIEWICZ: You modeled your singles.  
23 And they would combine in your results to give you  
24 multiples.

25 MEMBER SIEBER: Part of the process.

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1 MR. MISKIEWICZ: Yes. But you would still  
2 have to model the spurious event was a failure mode  
3 for that specific piece of equipment, --

4 MEMBER SIEBER: Right.

5 MR. MISKIEWICZ: -- which depends on the  
6 circuit analysis people telling you where that --

7 MEMBER SIEBER: So the philosophical  
8 discussion as to what the assumptions ought to be is  
9 sort of moot because the process of the PRA itself  
10 takes care of that if it's done thoroughly and done  
11 right.

12 MEMBER APOSTOLAKIS: One of the things  
13 that we don't do at this Committee is have  
14 presentations or briefings on the actual analysis that  
15 the industry is doing.

16 MEMBER SIEBER: Right.

17 MEMBER APOSTOLAKIS: I think that would be  
18 extremely beneficial to us if somehow we found a way  
19 to have the industry come and present a detailed PRA,  
20 fire PRA in this case. Anyway, that's a separate  
21 issue.

22 MEMBER DENNING: I think what we would  
23 like to do at this point is thank you gentlemen. And  
24 we may still ask you in the few minutes that we have  
25 left if we have some additional questions. We have

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1 the potential to hear about additional experimental  
2 work that could potentially change some perspectives,  
3 but I don't think we'll do that.

4 I think what we ought to do now is we  
5 would have some discussion while we still have the  
6 staff here and the industry here, we have some  
7 discussion? Would you agree, Graham, that we'll have  
8 some discussion here, see just kind of where we are  
9 sitting on this?

10 CHAIRMAN WALLIS: I was thinking about  
11 that. I think we certainly need discussion.

12 MEMBER SIEBER: Yes.

13 CHAIRMAN WALLIS: I think some of it needs  
14 to be in our working session, --

15 MEMBER DENNING: Yes.

16 CHAIRMAN WALLIS: -- rather than open  
17 session, but I think we can do some of it now. What  
18 little bit we can do now to clarify the situation  
19 certainly we should do now.

20 MEMBER ARMIJO: I have a question that may  
21 not be a discussion. Just in reading the staff's  
22 response to a lot of the comments received on the  
23 draft, there was reference to a lot of -- where is  
24 this thing, the screening tool, a risk screening tool,  
25 that the licensees develop a risk screening tool to be

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1 reviewed and approved by the staff.

2 This is a tool that would evaluate a  
3 variety of different multiple spurious actuations and  
4 sort them out and say, "These are the ones to worry  
5 about. And the rest we don't have to worry about."

6 What is your view? Does such a tool  
7 exist? Do you use such tools, both parties?

8 MR. MISKIEWICZ: We haven't kind of gotten  
9 to that step yet. I'm not exactly sure what the  
10 paragraph is you are referring to.

11 MEMBER ARMIJO: Yes. It's --

12 MR. MISKIEWICZ: But we can do  
13 sensitivities and say, "If I just fail the system, you  
14 know, a functional type of thing, if it's not  
15 significant, then I don't have to go down deeper and  
16 model all the individual spurious. I can screen it by  
17 saying it's not going to matter without doing the  
18 detailed modeling," you know.

19 MEMBER APOSTOLAKIS: The screening depends  
20 on a number of factors, this being one, but the other  
21 is the amount of fuel you have in your area, whether  
22 you can have a fire to begin with, the fire PRA.

23 MEMBER ARMIJO: I thought it was here is  
24 a large number of conductors that can cause spurious  
25 actuations of a large number of systems. And nobody

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1 has defined what scenarios are worrisome. It seems to  
2 me like it's a large number of mind-boggling barriers.  
3 And how do you sort those all?

4 MR. BARRETT: Let me address that.

5 MEMBER ARMIJO: Yes.

6 MR. BARRETT: One of the things that Duke  
7 has done -- and I think Progress is going to follow  
8 suit when they actually do their PRA -- is we have  
9 attempted to put our arms around the most significant  
10 multiples that we could think of by putting together  
11 an expert panel of people who know the plant, know the  
12 Appendix R design, no fire protection, and postulate  
13 these in an organized fashion, like going through  
14 PNIDs and plant design records to say, "All right.  
15 What are the real multiple spurious combinations that  
16 would really hurt me?" and capture those in scenarios  
17 so that they can be analyzed in detail in the fire PRA  
18 so that we can really look at the risk.

19 We're looking at it taking a three-pronged  
20 approach. We have the Appendix R analysis that says,  
21 "Here is all the safe shutdown stuff that I've got to  
22 have. Here are the cables and where they go in the  
23 plant. And then here is what gets damaged in each  
24 fire area."

25 And we take the expert panel. And we say,

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1 "Well, is there anything we missed? You know, is  
2 there something out there that because you end up  
3 flushing the toilet over here and you end up turning  
4 that light bulb on, the combination of things gets you  
5 something you didn't expect?" The expert panel is  
6 supposed to deal with that.

7 And then we also look at the PRA and true  
8 up all AOVs, true up all MOVs, and see if those kinds  
9 of things give us surprises that we didn't expect.  
10 Between the three of those, we think we're going to  
11 end up probably having 95 percent of the  
12 risk-significant scenarios.

13 MEMBER DENNING: For all of your plants,  
14 do you know where your cables are by tray?

15 MR. BARRETT: We didn't. We ended up  
16 having to pay to have that analysis done for us. I  
17 think it was originally determined in the '80s but was  
18 not captured in a database or anything. And we had to  
19 go back and --

20 MEMBER DENNING: But you had that for all  
21 your plants, do you?

22 MR. MISKIEWICZ: I wouldn't say all of the  
23 plants. That's a lot of work. In a lot of cases it's  
24 limited to the set of equipment that met the rule for  
25 the Appendix R compliance --

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1 MEMBER DENNING: It seems to say that --

2 MR. MISKIEWICZ: -- or our equipment that  
3 we want to credit from PRA perspective because there  
4 is risk-significant equipment in mitigation that is  
5 not within the scope of Appendix R right now. And  
6 that we'll add to the list. And some of those still  
7 need to be routed.

8 MEMBER DENNING: You do have additional  
9 cable routing that you would have to determine;  
10 whereas, you feel that you have already done the --

11 MR. BARRETT: There were some things in  
12 the PRA that we had not addressed in safe shutdown,  
13 and we're going to have to have --

14 MEMBER DENNING: Well, PRA is one thing.  
15 What about with this requirement? Does that change?  
16 Would you have to -- if this was imposed on you, do  
17 you think you have to do more cable tracing?

18 MR. BARRETT: What I'm talking about is  
19 our attempt to try to get our arms around all of the  
20 risk-significant scenarios.

21 MEMBER DENNING: Scenarios? Okay.

22 MR. BARRETT: So that's why we did the  
23 expert panel and all of that, to try to get our arms  
24 around things that we would have otherwise missed.

25 MEMBER DENNING: You keep saying

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1 "risk-significant." And we're in a space here where  
2 we're not necessarily risk-significant. It's broader  
3 than that.

4 MR. BARRETT: I think if you take all of  
5 the cables and you just fail them all and you say they  
6 all happen immediately, you're done.

7 MEMBER DENNING: You can't survive.

8 MR. BARRETT: Some of these areas you  
9 can't survive it.

10 MEMBER DENNING: Okay.

11 MEMBER SIEBER: On the other hand, from a  
12 risk standpoint, the set of cables that you have to  
13 know what the routing is becomes larger than the  
14 Appendix R set.

15 MR. BARRETT: Yes.

16 MEMBER SIEBER: But it is certainly not  
17 all of the cables. So there is going to be some  
18 physical work that has to be done if you don't have  
19 pull ticket. If you don't have the database, you  
20 can't --

21 VICE CHAIRMAN SHACK: In the NEI-001  
22 guidance, where, as I understand it, you do up to four  
23 failures, how do you select those four?

24 MR. BARRETT: A similar process with the  
25 expert panel and using Appendix R analysis, a similar

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1 process.

2 MR. FRUMKIN: This is Dan Frumkin from the  
3 staff.

4 One of the things that we have discovered  
5 about defining a failure is a lot of the analyses  
6 assume once spurious actuation, once spurious  
7 actuation, what the NEI or at least the risk, 2,403 --  
8 and I think NEI-001. They talk about multiple hot  
9 shorts.

10 Now, one pair of conductors coming  
11 together could cause numerous different spurious  
12 actuations. So I think that the staff and the --  
13 well, the staff has come out with 2,403 and has put it  
14 on the table.

15 We are looking for this hot short. That  
16 could cause whatever it could cause. We're not  
17 counting spurious actuations anymore. We're taking  
18 that hot short and saying, "Well, what could it  
19 cause?"

20 I think there was a situation where there  
21 was one cable or just a number, just a few conductors,  
22 or maybe it was even two conductors that could give an  
23 indication which could open all of 16 SRVs at one  
24 plant.

25 Now, a long time ago that might have been

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1 16 separate spurious actuations. And today we're  
2 looking at that as one pair of conductors coming  
3 together. And I think everybody is pretty much on the  
4 same page that yes, obviously if the circuits can  
5 cause all of those spurious actuations, we consider  
6 that.

7 MEMBER DENNING: Well, I guess a comment  
8 that I would have on generally what I have heard is  
9 that I think it's very clear that there are timing  
10 issues. If we go forward with the generic letter,  
11 then, at least in my interpretation of the generic  
12 letter, there are timing requirements that are not  
13 doable by the industry and that one would have to do  
14 some relaxation of that. And I don't see where just  
15 having the 30-day, where they can say, "It's going to  
16 take me longer as appropriate."

17 Now, it could be that maybe this should be  
18 more of an information-gathering generic letter,  
19 rather than one that is quite forcing the NRC's  
20 position about the need for multiple spurious  
21 actuations without a more relaxed position like NEI's.

22 I guess what I'm looking for are general  
23 comments as to people, where they are seemingly  
24 falling on this generic letter.

25 MEMBER MAYNARD: Well, I would agree with

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1 most of your comments there. First of all, I do  
2 believe that it clearly constitutes a backfit. We  
3 will get into some other things later on that, but we  
4 don't have to change regulations to be changing  
5 requirements. A change in staff position on what is  
6 acceptable for meeting a regulation, changing those  
7 position, also constitutes a backfit.

8 With that said, I would also like to say  
9 that this issue needs to be resolved. I think playing  
10 around too long about what is the right regulatory  
11 process isn't going to serve everybody's best interest  
12 either.

13 I think it is important. This issue has  
14 been around for 25 years. It needs to get resolved in  
15 an approach going forward as to what is it going to  
16 take to either make it go away as an issue or to  
17 actually fix it.

18 I think the 90 days, I think basically if  
19 it goes out the way it is, basically you're going to  
20 end up with everybody coming in with time request  
21 extensions. And so I don't think that's really the  
22 right thing to do there.

23 If it goes out the way it is, I think it  
24 needs to extend that time. I think it might be better  
25 to go out with what is truly an information request,

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1 to gather information to then be able to determine  
2 what the next steps are.

3 But, again, I don't think process should  
4 drag out for another 5 or 10 or 15, 20 years.  
5 Something needs to be done to put it on a resolution  
6 path.

7 VICE CHAIRMAN SHACK: Let me just come  
8 back to that for a second. I mean, we know what you  
9 expect from the 40 plants that are going for NFPA 805.  
10 What do you expect from the others?

11 MR. WOLFGANG: This is Bob Wolfgang again.

12 I think a number of them are going to come  
13 back and say, "We meet our licensing basis, and thank  
14 you very much. And good-bye."

15 MEMBER DENNING: Will they really say  
16 that? I mean, your --

17 MR. WOLFGANG: That is one thing.

18 VICE CHAIRMAN SHACK: Will you accept that  
19 answer?

20 MEMBER SIEBER: Send it over to  
21 enforcement.

22 MR. WOLFGANG: No. No, we won't. What we  
23 will hear from others is --

24 VICE CHAIRMAN SHACK: What would you  
25 consider an acceptable response from the others?

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1 MR. WOLFGANG: Well, "We don't address  
2 multiple spurious actuations. Here is our plan to  
3 address it to do" X, Y, Z. I don't know. "Do  
4 physical mods."

5 MEMBER DENNING: That's a six months'  
6 answer.

7 MR. WOLFGANG: Yes. That will be the  
8 six-month answer. But initially, yes, either you meet  
9 it or you don't meet it. We don't think we meet it.  
10 We think we meet it.

11 For the first round, that's all I think  
12 we're going to get.

13 MEMBER DENNING: Getting back to this  
14 backfit question, I'm not sure that ACRS is the  
15 appropriate one to answer that. Obviously it makes it  
16 easier for the regulatory staff if it's not a backfit  
17 question.

18 MEMBER BONACA: Yes. One thing that  
19 troubles me a little bit is, you know, is it a  
20 significant issue or is it not a significant issue?  
21 That's a plant-specific answer. And so we're not  
22 going to find out an answer to the question.

23 And I think that if we had to perform a  
24 generic evaluation to justify a backfit, I'm not sure  
25 that it could be done because, I mean, it's so

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1 specific to the plant, the age, to whatever the  
2 situation may be.

3 MEMBER DENNING: But this question of a  
4 specific issue, I think you can do a reduced analysis  
5 to determine. I think you can screen out stuff a  
6 priori --

7 MEMBER BONACA: I think so, too.

8 MEMBER DENNING: -- you know, so that it  
9 isn't such an onerous job to determine what's  
10 important and what's a potentially significant risk  
11 contributor here.

12 MEMBER BONACA: Clearly, I mean, something  
13 has to be done. I mean, we have new evidence in front  
14 of us. And I completely agree with you, Otto, that it  
15 can't wait. They have to be dealt with.

16 I think that, however, the industry needs  
17 more time to deal with this. They don't have a  
18 ready-made process by which they can screen this out  
19 and address it. So the issue is more the time.

20 Now, the next statement again, as reported  
21 to you, is the fact that we are not really the best  
22 charges of what is the most appropriate regulatory  
23 process to follow to go ahead with this.

24 MEMBER APOSTOLAKIS: Our job here is to  
25 judge the generic letter as presented to us.

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1 MEMBER BONACA: Yes.

2 CHAIRMAN WALLIS: I am just wondering how  
3 we add value to this. If we were a subcommittee, we  
4 might well say, "Look, we now know what the issues  
5 are. We think there must be a better way than having  
6 the agency send out this generic letter asking for  
7 things which may be impractical for some plants," but,  
8 then, there should be some way to work with the plants  
9 to figure out what is the right solution to this  
10 technical problem. I'm not sure.

11 We're also sort of a facilitator between  
12 industry and the agency, and that's not really our  
13 job, though, is it?

14 MEMBER SIEBER: Well, the other thing that  
15 is not our job is to try to figure out whether it's a  
16 backfit or not. That's a legal question.

17 CHAIRMAN WALLIS: Well, we don't even know  
18 how important it is because we don't have these proper  
19 risk analyses.

20 MEMBER DENNING: Well, having resolved  
21 these questions, I now turn it back to you, Mr.  
22 Chairman.

23 (Laughter.)

24 CHAIRMAN WALLIS: I can make a very  
25 decision, which is to take a break for lunch. We are

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1 going to be ethics-trained at 12:15. And then we go  
2 to work again at 1:30. Thank you very much for your  
3 presentations.

4 We'll take a break, and as a Committee,  
5 we're going to be back here, not on the transcripts or  
6 anything, for ethics training at 12:15. We'll start  
7 the official proceedings again at 1:30.

8 (Whereupon, a luncheon recess was taken  
9 at 11:33 a.m.)

A-F-T-E-R-N-O-O-N S-E-S-S-I-O-N

(1:33 p.m.)

CHAIRMAN WALLIS: Back into session. The next item on the agenda is another generic letter; first of all, underground cable failures that disable accident mitigation systems.

Our cognizant member is Mario Bonaca. I will hand over the meeting to him. Please go ahead, Mario.

MEMBER BONACA: Thank you, Mr. Chairman.

3) DRAFT FINAL GENERIC LETTER 2006-XX,

"INACCESSIBLE OR UNDERGROUND CABLE FAILURES THAT  
DISABLE ACCIDENT MITIGATION SYSTEMS"

3.1) REMARKS BY THE SUBCOMMITTEE CHAIRMAN

MEMBER BONACA: We have a presentation from the staff. They are proposing to issue a generic letter on inaccessible underground cable failures that disable accident mitigation systems.

We have recently become conversant with this issue through license renewal. You may remember that the GALL report requires for license renewal the existence of two programs: one, a program to detect the presence of water and the watering actions; and the other one is a program to test the cables and essentially-- so we are aware of the concern here.

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1 And the staff is now addressing this issue in the  
2 current licensing area.

3 And so, with that, I will turn to the  
4 staff. Mr. Mayfield?

5 3.2) BRIEFING BY AND DISCUSSIONS WITH  
6 REPRESENTATIVES OF THE NRC STAFF

7 MR. MAYFIELD: Good afternoon. I'm Mike  
8 Mayfield, the Director of the Division of Engineering.  
9 And my division is sponsoring this generic letter.

10 We're here this afternoon to seek ACRS  
11 endorsement to publish the generic letter. The  
12 generic letter, as Mr. Koshy will describe, provides  
13 some information to licensees on the significance of  
14 these potential failures, and seeks some information  
15 from licensees regarding the monitoring of these  
16 cables.

17 Tom Koshy from the Electrical Engineering  
18 Branch will make the presentation.

19 MR. KOSHY: Thank you, Mike.

20 As Dr. Bonaca mentioned to you, this was  
21 first brought to your attention as a problem during  
22 the license renewal hearing at the ACRS. The question  
23 was, is dewatering every ten years going to prevent  
24 the problem?

25 At that time, in light of the failures

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1 that we had noticed at the time, we thought of taking  
2 it as an operating reactor issue under Part 50. And  
3 we did some serious looking into see how big the  
4 problems are.

5 The safety concerns identified at the time  
6 were some of these underground and inaccessible cables  
7 supply power to some safety-related components. Using  
8 some examples here, the off-site power, the cable that  
9 brings the off-site power, to the safety buses.

10 The second would be the emergency diesel  
11 generator feeder. This is critical in those cases  
12 where the emergency diesel generator to building is  
13 physical apart from the main building so that the  
14 underground cables bring into power; and then the  
15 emergency service water pumps, these cases where the  
16 pump house is located again, you know, physically away  
17 from the plant so that the power supply to the service  
18 water pump has to go through underground cables.

19 And failure of one of these cables could  
20 affect multiple systems in these sense there could be  
21 a train, cooling off of safety systems, collectively  
22 influencing more than just one isolated system.

23 Most of these failures that we came across  
24 did not have any direct reference to having a  
25 qualification for this cable to withstand the moisture

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1 environment or, essentially, you know, in duct banks,  
2 if it is immersed in water, you know, can it  
3 withstand. That type of qualification had not been in  
4 existence for these cables that we came across.

5 MEMBER BONACA: Let me understand now,  
6 however. These are cables in safety-related  
7 applications?

8 MR. KOSHY: Yes.

9 MEMBER BONACA: Okay. So evidently on day  
10 one, when the plant was built, there was no  
11 expectation that the cable would be wetted?

12 MR. KOSHY: Yes. In fact, they thought it  
13 would stay relatively dry, but as duct banks develop  
14 cracks, you know, there would be traffic about it.  
15 And eventually these things crack. And depending on  
16 the water table, you know, it could be immersed for a  
17 long time or maybe a short time.

18 MEMBER BONACA: Well, in many cases, these  
19 cables are buried --

20 MR. KOSHY: Yes.

21 MEMBER BONACA: -- in the ground. So from  
22 day one, there was an expectation that they would see  
23 humidity and why we are not environmentally qualified.

24 MR. KOSHY: Either it was not specified at  
25 the time or they thought that, you know, the existing

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1 material at the time could withstand some level of  
2 moisture. For some reason, they did not specifically  
3 seek out.

4 The reason I stated that is, you know,  
5 much in the later period, now we have cables that can  
6 withstand such highly moist environment. In fact, I  
7 know of a case where they have run the cable to the  
8 river. That's for a --

9 CHAIRMAN WALLIS: But not forever.

10 MR. KOSHY: Excuse me?

11 CHAIRMAN WALLIS: Just because they are  
12 qualified doesn't mean they will survive forever in  
13 this environment.

14 MR. KOSHY: You are right, yes. Yes.  
15 They may not survive forever, but at least, you know,  
16 they have some demonstrated capability for a certain  
17 period that it can be even immersed in water and still  
18 do its function.

19 But all of that addresses, you know, the  
20 possibility that you need to know the condition of the  
21 insulation so that you have that confidence that it  
22 can do its function for the foreseeable future.

23 We went back into the history of the LERs  
24 that we have on record. We saw failure at 17 sites  
25 and cable replacements at 100 or so. And most of the

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1 faulty cables were not discovered until there was an  
2 operational failure.

3 Again, these are based on LERs, where the  
4 system has a redundant system or some reason, because  
5 of a plant trip or the failure was serious enough it  
6 prompted an LER.

7 MEMBER ARMIJO: What is your definition of  
8 a medium cable?

9 MR. KOSHY: 5 kV.

10 MEMBER ARMIJO: And above?

11 MR. KOSHY: 5 kV. Well, in the sense of  
12 when you go into 13 kV, you know, some people label it  
13 as medium also.

14 MEMBER ARMIJO: Okay.

15 CHAIRMAN WALLIS: High tension.

16 MEMBER SIEBER: Four-eighty volts to --

17 MR. KOSHY: Four-eighty will be below  
18 that. Yes. We will not call that medium, yes.

19 MEMBER SIEBER: Four-eighty is --

20 MEMBER BONACA: But you include those?

21 MR. KOSHY: Excuse me?

22 MEMBER BONACA: But you include those in  
23 the --

24 MR. KOSHY: Yes, we are including those  
25 because there are certain plants where the emergency

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1 diesel generator generates voltage at 480 and  
2 emergency service water and safety pumps are at 480  
3 volts, some small plants and early vintage.

4 MEMBER BONACA: Okay.

5 MR. KOSHY: So we wanted to include that  
6 also. That's why we went more than just medium  
7 voltage.

8 The EPRI data indicated about 65 cable  
9 failures. And later the white paper which NEI has  
10 submitted indicated about 55 failures for about 15  
11 plants.

12 Most of the cable failures have what in  
13 common? It's about 12 years of age. And the cable  
14 was subjected to some type of, you know, moisture  
15 environment, probably for a longer duration or a  
16 shorter duration. And these things were essentially  
17 common factors.

18 The cables, again, that we are focusing on  
19 is about roughly about six to eight cables, you know,  
20 depending on the design uniqueness, the cables that  
21 can have the most, let's say, significant impact on  
22 the plant.

23 MEMBER MAYNARD: The cable was about 12  
24 years old? You're saying that all of these failures  
25 were about the same age or --

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1 MR. KOSHY: No. More than that. There  
2 are some 20-plus.

3 MEMBER MAYNARD: Okay. All right.

4 MR. KOSHY: Yes.

5 CHAIRMAN WALLIS: It was at least 12 years  
6 old. At least 12 years. I was trying to figure it  
7 out. If it's every 12 years, that's pretty severe.

8 MR. KOSHY: You're right. Twelve and  
9 above. So in this generic letter, what we are  
10 focusing on is power cables that are within the scope  
11 of the maintenance rule, including cables connected to  
12 off-site power, emergency service water, and the other  
13 examples that I stated before, and those routed  
14 through underground or inaccessible locations, such as  
15 buried conduits, cable troughs, above-ground and  
16 underground. And these are the things that we are  
17 considering to be within the scope of this generic  
18 letter.

19 The benefits of this program are gaining  
20 confidence in the capability of the cable to respond  
21 to design bases events. To give you an example, at  
22 Turkey Point after the hurricane, the diesel had to  
23 run for about a week continuously. And thereafter for  
24 a month's period, the diesel had to come back on for  
25 other spurious power outages.

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1           So if you are looking into an accident  
2 where it has to be on a LOOP condition where these  
3 cables may need to be relied on for a few weeks. So  
4 we are not looking at a few hours of operation. The  
5 confidence needs to be gained for a period much higher  
6 than a few hours, which is usually the subject of our  
7 maintenance and surveillance activities.

8           MEMBER BONACA: Do you have examples of  
9 failures in service that were not exhibited during  
10 functional testing?

11           MR. KOSHY: What we have, the reported  
12 failures are a combination of both. Some in-service  
13 failures certain plants appear to have more than  
14 others. And others, when you start for surveillance,  
15 you find out that, you know, after a couple of hours,  
16 it fails.

17           So the LERs that we recorded are those  
18 cases where the plant impact was significant, so in  
19 the sense either operational. And if it is purely  
20 during a surveillance, we will not get an LER report  
21 on it.

22           So that's some of the problem that we are  
23 facing. The LERs that we received are so limited in  
24 number because, you know, it had to either bring a  
25 plant down or give an easy access situation for us to

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1 plant an LER report.

2 So that's why we are focusing on getting  
3 a handle on the extent of failures so we can engage  
4 them and see what other actions would be necessary.

5 CHAIRMAN WALLIS: Could you explain  
6 something to me?

7 MR. KOSHY: Yes.

8 CHAIRMAN WALLIS: I can understand  
9 off-site power sort of coming in on the underground  
10 cable. Why is diesel generator? Why does the diesel  
11 generator have underground cables? Is it part of the  
12 plant?

13 MR. KOSHY: Yes. For example, in some  
14 plants, the building is a separate building.

15 CHAIRMAN WALLIS: It's in a separate  
16 building. It's in a separate building.

17 MR. KOSHY: Yes. For example --

18 CHAIRMAN WALLIS: Okay.

19 MR. KOSHY: -- they have separate  
20 building.

21 CHAIRMAN WALLIS: They might be in a  
22 separate building?

23 MR. KOSHY: Yes.

24 CHAIRMAN WALLIS: That's very different  
25 from, say, something that comes from off-site power,

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1 where the cable may be a long cable from --

2 MR. KOSHY: Yes. That will be  
3 significantly longer. That will be from the  
4 switchyard. In some cases, you will have a situation  
5 closer to the plant, where you bring down to 13 kV or  
6 so.

7 CHAIRMAN WALLIS: Okay. Thank you.

8 MR. KOSHY: The next benefit is we can  
9 prevent the unanticipated failures that cause plant  
10 transients by using the maintenance rule as the scope.  
11 We are also looking at challenges to the plant in the  
12 sense of what will give you a plant transient. So  
13 that is what is seen as the scope of this generic  
14 letter.

15 The next is you can use a convenient  
16 outage if you know the rate of degradation. Rather  
17 than taking, you know, unwarranted outages, you can  
18 schedule that cable replacement for a convenient  
19 refueling outage and do the replacement with minimum  
20 interruption.

21 CHAIRMAN WALLIS: Are these cables usually  
22 designed so they can easily be pulled through to  
23 repair them?

24 MR. KOSHY: No. It is very  
25 time-consuming, most of the --

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1 CHAIRMAN WALLIS: There's not a big duct  
2 in the cable and you just drag through a new cable?

3 MR. KOSHY: No.

4 CHAIRMAN WALLIS: No? You have to take it  
5 out? You have to dig it up?

6 MEMBER SIEBER: It's the whole thing. No.

7 MR. KOSHY: Well, pull-through is there,  
8 but the thing is it has a lot of staging. And you  
9 have energized equipment on both sides. So you need  
10 to essentially take some bus outages. So it is  
11 significantly time-consuming.

12 CHAIRMAN WALLIS: Yes, but you don't have  
13 to dig it out?

14 MR. KOSHY: Unless it is direct buried  
15 cable.

16 MEMBER BONACA: In fact, I mean, for  
17 example, yesterday during the review of Monticello,  
18 the majority of their underground cable, they're  
19 buried.

20 CHAIRMAN WALLIS: Those are usually  
21 utility duct or something, in other words.

22 VICE CHAIRMAN SHACK: This is direct  
23 buried.

24 CHAIRMAN WALLIS: Direct buried cable?

25 MR. KOSHY: Those are not exceptions.

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1 Usually you will have a duct bank with some sleeves in  
2 there so that you can pull through it.

3 MEMBER BONACA: And it depends on the age  
4 of the plant. I mean, Monticello is an older plant.  
5 They buried it, and that was it.

6 MR. KOSHY: So you have a wide variety on  
7 those?

8 MR. MORRIS: Tom, George Morris, EEEB.  
9 Some of the original cables that were pulled through  
10 duct bank, all of the original cables that were pulled  
11 through duct bank, were pulled through with the use of  
12 cable lubricant to reduce the friction. After they  
13 had been in there for a while, that lubricant has  
14 dried up.

15 MEMBER BONACA: It doesn't work.

16 MR. MORRIS: In some cases, it's almost  
17 like concrete.

18 MR. KOSHY: Okay. Moving on to some  
19 examples, Ocone is a success story where they found  
20 that two of the six cables had significant  
21 degradation. And they were able to monitor it and  
22 take the outage at a convenient time so that they can  
23 replace them.

24 Another example I am using here is Peach  
25 Bottom. When they experienced a failure, they decided

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1 to make a global replacement. You know, they didn't  
2 want to do any testing at all. And that's also a  
3 solution.

4 CHAIRMAN WALLIS: Now, is it always water  
5 that leads to degraded cables? It seems to me that  
6 you could have a cable and a duct which might just --  
7 you know, the insulation can over a period of time  
8 oxide or whatever it does. I mean, even in your house  
9 without water, you get cables that --

10 MR. KOSHY: Yes.

11 CHAIRMAN WALLIS: The insulation cracks  
12 and so on.

13 MR. KOSHY: This has some influence in the  
14 sense if it is a dry insulation and there is only  
15 cracks, chances are it will survive a little longer.

16 CHAIRMAN WALLIS: That's right, but it may  
17 --

18 MR. KOSHY: The presence of chemicals --

19 CHAIRMAN WALLIS: Makes it work.

20 MR. KOSHY: -- create default.

21 CHAIRMAN WALLIS: It's not essential that  
22 you have moisture, is it?

23 MR. KOSHY: Right. You're right. We are  
24 not trying to look at the root cause of what causes  
25 the failure. We are more interested in seeing,

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1       irrespective of the causes, let's have a program in  
2       place so that we can prevent such unanticipated  
3       failures and have a great confidence in the accident  
4       mitigation capability. So that's the focus we are  
5       trying to get because for --

6                   CHAIRMAN WALLIS: There is no routine  
7       measurement of, say, resistance of ground of a cable?  
8       There is no routine --

9                   MR. KOSHY: There is some technology  
10      developing that way, but online systems have not been  
11      doing that well. I think the industry is headed that  
12      way and there is some aggressive effort in the  
13      industry for coming up with something like that or,  
14      rather, building confidence in the systems that are  
15      now under development.

16                   Oyster Creek is an example where they  
17      replaced the cables and they had few repeated  
18      failures. This design is also unique. They  
19      essentially had this cable going about 200 feet away  
20      from the main plant as an extension of the safety bus.  
21      And this is remaining energized all the time. And  
22      that earlier had several failures.

23                   So the information that we are requesting  
24      is provide to us a history of the cable failures in  
25      the scope that I discussed just before and a

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1 description and frequency of the inspection, testing,  
2 and the monitoring programs in place. And if you do  
3 not have a monitoring program in place, explain to us  
4 why such a program is not necessary. So that is  
5 essentially what we are asking in --

6 CHAIRMAN WALLIS: So this is really  
7 information gathering. This isn't requiring an  
8 action?

9 MR. KOSHY: Right, right.

10 VICE CHAIRMAN SHACK: Now, are you  
11 distinguishing between a monitoring program and a  
12 functional testing program here?

13 MR. KOSHY: Okay. The explanation that we  
14 have given, in fact, I am addressing as a response to  
15 a public comment, what we are saying is the functional  
16 testing that you do that you energize for a short  
17 period doesn't give you any confidence that it will do  
18 it again.

19 VICE CHAIRMAN SHACK: Okay. So you're not  
20 counting that as a monitoring program?

21 MR. KOSHY: Yes. We are not.

22 MEMBER SIEBER: A surveillance test.

23 MR. KOSHY: These are the organizations  
24 that have given response to the first version that  
25 went out for public comments. And I will address the

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1 highlights of how we addressed those comments.

2 Cable failures are random. And,  
3 therefore, no NRC action is required.

4 CHAIRMAN WALLIS: It sounds like saying  
5 they're an act of God or something.

6 MR. KOSHY: Yes. We just explained the  
7 surveillance activity, which wouldn't give you  
8 confidence on its future performance. You need to in  
9 some way monitor the condition of that insulation so  
10 that we can build that confidence.

11 Again, you know, this is the small group  
12 of cable where you have this problem. Otherwise, the  
13 rest of the cable is in a dry environment. Next to  
14 selectable sealed-in concrete, you know, these cables  
15 should be the most reliable piece of equipment in a  
16 plant, you know, should not be failing for about 40  
17 years or, in fact, for 60 years, you know, if it is  
18 the environment and the conditions are right.

19 And I quickly explained before that the  
20 low-voltage cables are included because some of the  
21 early vintage plants have this 480-volt equipment for  
22 safety buses, diesel, and naturalized emergency  
23 service water, and service water equipment.

24 CHAIRMAN WALLIS: The original sentence is  
25 garbled. It doesn't matter. Essentially we have a

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1 period after impact, and that's all right. Scope is  
2 limited.

3 MR. KOSHY: Okay. Again, we just  
4 addressed this issue, why this basic surveillance  
5 tests of operating for a half an hour or two hours  
6 wouldn't be sufficient to gain that confidence for --

7 CHAIRMAN WALLIS: What you do is you put  
8 on them the voltage that they would have in operations  
9 and --

10 MR. KOSHY: No. You actually energize a  
11 --

12 CHAIRMAN WALLIS: Do you actually have to  
13 have current going? Do you have to current going  
14 through these cables to test them or does it have the  
15 voltage applied to them and see if there's a leakage?

16 MR. KOSHY: Yes. There are about eight or  
17 ten techniques in the industry.

18 CHAIRMAN WALLIS: There's a whole lot of  
19 techniques.

20 MR. KOSHY: Yes, yes. And the thing is  
21 the early technique was just apply very high voltage  
22 and make it fail. That was the most crude way of  
23 doing it.

24 MEMBER SIEBER: Meggering.

25 MR. KOSHY: Meggering is another method,

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1 but that has certain weaknesses, too.

2 MEMBER SIEBER: You have reflective  
3 techniques.

4 MR. KOSHY: Yes. Time domain reflects  
5 III, and about six or eight techniques are there. And  
6 there are still some under development. Collectively  
7 you have about two IEEE standards that go into details  
8 of the type of tests available and the level of  
9 confidence that you have based on the type of cable.

10 So depending on if you have a shield and  
11 what kind of shield and what type of rubber material  
12 is used, the level of confidence is different, you  
13 know, depending on the type of test that you do.

14 So there is some industry that two IEEE  
15 standards are available to address that and which one  
16 is better and which one is desired.

17 MEMBER SIEBER: You can get some pretty  
18 high voltages in these cables from switching  
19 transients.

20 MR. KOSHY: That's true.

21 MEMBER SIEBER: It will go well beyond the  
22 rating for a very brief period of time. And sometimes  
23 that's when the insulation fails.

24 MR. KOSHY: Yes.

25 MEMBER BONACA: By "surveillance test,"

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1 you mean surveillance of the equipment and this power  
2 by the cable?

3 MR. KOSHY: Right. You are giving normal  
4 voltage and normal function of a couple of hours, you  
5 know, like in the pump in service inspection or type  
6 of surveillance you will expect to run in for two or  
7 three hours, make sure it is for using the rate of  
8 flow and things like that. That's the type of test  
9 that will not give you a feeling of how good the  
10 insulation is. Will it last for the next two weeks of  
11 runoff?

12 The regulatory basis for our cable  
13 monitoring is we have added that what is seen in bold,  
14 that condition is something that we really did not  
15 have in the first version. And we are essentially  
16 saying that "assess the continuity of the systems and  
17 the condition of the components." So you need to know  
18 the condition of this insulation so that we can have  
19 that confidence on its performance.

20 MEMBER ARMIJO: Could you expand that?  
21 Condition based on electrical properties? Are you  
22 actually looking for physical condition? They're in  
23 accessible.

24 MR. KOSHY: These are inaccessible, but  
25 you do have state-of-the-art techniques available in

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1 electrical testing which will measure the testing of  
2 the insulation.

3 MEMBER ARMIJO: Okay.

4 MR. KOSHY: So if you can establish that  
5 the integrity of the insulation is reasonable, then  
6 you have that confidence that it will not fail in the  
7 most probable cases.

8 MEMBER ARMIJO: Thank you.

9 MR. KOSHY: The question was regarding  
10 multiple cable failures. The only example that we  
11 have collected in light of our efforts is a case where  
12 one insulation failure was in the circulating water  
13 pump, resulted in taking two other substations out  
14 with it.

15 The possibility that we are talking of is  
16 the fault itself causes a transient and sends some  
17 transient current. And if you have some near-failure  
18 equipment, that can be a cause for additional  
19 failures. You know, these are speculative problems.  
20 And this is the only example that we have on record  
21 for that.

22 Now, the modifications that we have done  
23 in light of the comments on this are editorial in  
24 nature, a good part. We revised the scope to include  
25 the above-ground and below-ground duct banks; removed

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1 the broadband spectroscopy because that's not a proven  
2 technique yet, but, again, that could be a technique  
3 available in the future; revised the requested  
4 information to include the type of service so that we  
5 will be able to know if there are repeated failures in  
6 a certain area. And we revised the data collection  
7 time to 60 hours.

8 CHAIRMAN WALLIS: So it would seem that  
9 there is still a gap between your view and the  
10 industry's view.

11 MR. KOSHY: Yes.

12 CHAIRMAN WALLIS: The industry had some  
13 pretty strong comments. And your modifications don't  
14 reflect large changes in response to their comments.

15 MEMBER SIEBER: Right.

16 CHAIRMAN WALLIS: So there would seem to  
17 be still a big gap between your view and the  
18 industry's view. Is that true?

19 MR. KOSHY: I will address that in the  
20 next slides along with the NEI white paper issues, in  
21 slides 16 and 17.

22 CHAIRMAN WALLIS: Okay.

23 MR. KOSHY: We presented this to CRGR.  
24 And CRGR asked us to do two improvements on the  
25 generic letter: to bring the focus on the power

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1 cables itself and also to add a safety-related example  
2 to show the significance of this failure on a plant.  
3 In the package that you have received, we have  
4 incorporated those changes.

5 We received the NEI white paper much after  
6 the comment period on May 1st. I have addressed the  
7 highlights in this coming couple of slides. One is a  
8 graded approach. Again, the number that you see on  
9 the top is the sections that correspond to the NEI  
10 white paper, 6.6.

11 The graded approach for monitoring and  
12 replacement of cables, the bullets are many cables do  
13 not power safety-related equipment; and the other one,  
14 graded approach to replacement and monitoring is best  
15 for safety and business reasons.

16 Our response is that we are only focusing  
17 on those that are significant. That's the very reason  
18 that we are using to bring the scope down to the  
19 maintenance rule. And we mentioned certain systems in  
20 there because to, let's say, overcome the variances  
21 and interpretations on that rule and also because  
22 those examples that we state there are the ones that  
23 have most impact on the plant in the sense affecting  
24 multiple systems.

25 Therefore, these are classified as most

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1 important because of these reasons. And, therefore,  
2 you know, it will be important to prevent the  
3 transients and also in supporting of mitigating the  
4 accident.

5 So that's how we have narrowed the scope  
6 and as to bringing down to only important cables and  
7 not all of the cables at large. And the numbers that  
8 you see in that white paper are some plants have like  
9 300-plus cables. And that won't be within the scope  
10 of maintenance rule.

11 The next one, the recommendations again in  
12 chapter 8, is provide dry environment, prepare for  
13 cable failures, and share failure resolutions.

14 Providing a dry environment -- again, you  
15 know, these are all installed cables. It's not quite  
16 practical. And pumping out would help. It will slow  
17 down the failure, but it cannot prevent the failure.  
18 It may take a little longer. And these cable failures  
19 could affect many systems. And the replacement of  
20 these cables is very time-consuming.

21 So if you have a valid accident mitigation  
22 method and at that time trying to make this cable  
23 replacement could be very difficult because the cables  
24 that run in the same duct banks could be helping the  
25 accident mitigation at that time. And your cable

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1 pulling and taking bus outages would not be desirable  
2 actions when you run into an accident environment or  
3 facing a LOOP or a station blackout.

4 And the technique is available there to  
5 have that reasonable confidence so that we can rely on  
6 these cables for continued operation.

7 That's all we have prepared for presenting  
8 to you. And if you have --

9 MEMBER BONACA: I have a question --

10 MR. KOSHY: Sure.

11 MEMBER BONACA: -- regarding in the  
12 generic letter, you talk about 23 LERs --

13 MR. KOSHY: Right.

14 MEMBER BONACA: -- and two monitor  
15 reports. Then the letter says that you believe that  
16 this is a very small fraction. That is the word used  
17 in the LER in the generic letter, a very small  
18 fraction of the actual failure to take place, which  
19 tells me that the number of failures that happen may  
20 be in the hundreds.

21 What is the projection? What does it mean  
22 that 25 in total is a very small fraction?

23 MR. KOSHY: It's very difficult to make  
24 such an estimate, but let me give a personal  
25 experience that I know of. I was at an AIT for a

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1 plant where they had such a cable failure. At that  
2 time they had six cable failures already when we had  
3 the AIT in the mid '80s. So that is repeated failures  
4 happening at one plant.

5 MEMBER BONACA: Okay.

6 MR. KOSHY: Again, I know of another  
7 Northeastern plant where they have all of these  
8 service water cable and emergency service water cables  
9 going through manholes. And they had splices in that  
10 also. And this manhole gets filled with water. And  
11 when the manhole cover knocks out, that's when you  
12 find out the splice failed. They had also quite  
13 repeated failures.

14 So certain plants may have a higher  
15 susceptibility because of groundwater and the design  
16 uniqueness. There may be some plants in absolutely  
17 dry environment, like WNP 2 in the middle of the  
18 desert. They may not have any cable problems because  
19 it's always dry. and if it all drains, it dries out  
20 so fast. So some plants may be fully exempt from this  
21 problem.

22 If the water table is a guide, those are  
23 the ones where you have high susceptibility and  
24 failures. And some plants are kind of glaringly  
25 different than others.

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1                   MEMBER BONACA: The information you are  
2 requesting is regarding all cables, right, not only  
3 those in a weather condition?

4                   MR. KOSHY: All cables and inaccessible.

5                   MEMBER BONACA: Inaccessible.

6                   MR. KOSHY: Yes.

7                   MEMBER BONACA: Exactly. Okay.

8                   MR. KOSHY: So plants where they did not  
9 have failures would not have anything to report. But  
10 if you had failures, we would like to know them --

11                   MEMBER BONACA: Yes.

12                   MR. KOSHY: -- so that we can kind of  
13 gauge, you know, are there repeated problems, what are  
14 the vulnerabilities, and based on that probably share  
15 the lessons and see if you have to take further  
16 action. Maybe it's down to a few plants. We do not  
17 know that because we lack the data to support that.

18                   And the NEI white paper data shows about  
19 15 plants having about 45 to 50 failures. That could  
20 be an indication because they focused on underground  
21 and medium voltage only.

22                   MEMBER BONACA: But your monitoring  
23 program that you're talking about doesn't deal only  
24 with cables that failed. It deals with cable aging  
25 that may be operable during functional testing that

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1 failed during demand, service.

2 So how are you going to gather information  
3 regarding these kind of cables?

4 MR. KOSHY: Okay. What we are saying is  
5 if those cables are within the scope of maintenance --

6 MEMBER BONACA: Yes.

7 MR. KOSHY: -- and they're underground and  
8 inaccessible, tell us if you have failures. And do  
9 you have a program when they have this susceptibility  
10 for failure to make sure that it wouldn't fail?

11 MEMBER BONACA: I understand.

12 MR. KOSHY: So you're not on the scope.  
13 Tell us what the failure is. And see how you monitor.

14 MEMBER BONACA: Right.

15 MEMBER ARMIJO: I have a question. How  
16 can you have a failure of above-ground inaccessible  
17 cable without water? Is it --

18 MR. KOSHY: Okay. What happens is, you  
19 know, even in some large conduit connections which go  
20 on the surface because of the variance, you get  
21 condensation built in there unless you have a way of  
22 venting it out.

23 MEMBER ARMIJO: Well, it could be a  
24 significant amount of water.

25 MR. KOSHY: You could collect all the

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1 time.

2 CHAIRMAN WALLIS: You get a humid day and  
3 a cold night.

4 MR. KOSHY: For the condensation and --

5 MEMBER SIEBER: You can get cable failures  
6 from things other than water.

7 MR. KOSHY: Yes, other chemicals and other  
8 leeching, yes.

9 MEMBER SIEBER: Chemicals, overheating.  
10 You know, that degrades insulation or defect in  
11 splices, for example, if --

12 MR. KOSHY: Yes. Splices is another  
13 vulnerable point.

14 MEMBER SIEBER: It's handmade.

15 MEMBER MAYNARD: A couple of questions.  
16 On the provided inscription of the frequency of all  
17 inspection testing, monitoring, are you talking about  
18 what is currently in place or are you asking the  
19 licensee to go back to day one for all of what testing  
20 has been done?

21 MR. KOSHY: We are asking for what you  
22 have in place now so that you can put in place such  
23 unanticipated failures.

24 MEMBER MAYNARD: Okay. And the other  
25 thing is, is the staff coordinating in any way? This

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1 is requesting this information to be within 90 days.

2 MR. KOSHY: Right.

3 MEMBER MAYNARD: And it would appear to me  
4 that if the other generic letter on the spurious  
5 actuation gets issued, a lot of the same resources  
6 could be required or needed for a lot of these  
7 activities, both dealing with electrical circuits,  
8 just --

9 MEMBER SIEBER: This one is pretty --

10 MR. KOSHY: We will work with the Generic  
11 Communications Division so that we would be sensitive  
12 to that.

13 CHAIRMAN WALLIS: So what are you going  
14 with the information when you get it?

15 MR. KOSHY: What we are hoping is that  
16 depending on, let's say, the breadth and depth of the  
17 problem as to why widespread, we may have to think of  
18 NRC action if that warrants it. We have --

19 CHAIRMAN WALLIS: You think that there  
20 might be some problem. You have this sort of you  
21 almost call it a fishing expedition, where you get all  
22 of this information. And then you look at it and say,  
23 "Aha. Now we have to do something or not." You're  
24 not quite sure what you are going to find.

25 MR. KOSHY: Okay. We know it is a

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1 significant problem in the light of what I explained  
2 to you.

3 CHAIRMAN WALLIS: There have been events,  
4 right.

5 MR. KOSHY: Yes. We have been having  
6 events, which either the plant is out or disabled  
7 safety systems. And those things kind of give you a  
8 flavor of significance.

9 CHAIRMAN WALLIS: But the result of all of  
10 this information gathering might be that you decide  
11 everything is okay as it is now.

12 MR. KOSHY: If the industry has, let's  
13 say, commitments to prevent such failures, yes. But  
14 if you are seeing failures and repeated failures, we  
15 have to rethink what we should be doing. Okay? We  
16 are not there yet. We need to --

17 MR. MAYFIELD: Professor Wallis, this is  
18 Mike Mayfield from the staff. As we assess the  
19 results we get back from this, we would have to make  
20 a decision whether generic action is warranted or is  
21 there some plant-specific action that is warranted or  
22 things are being managed appropriately as it is. And  
23 we just don't know until we get the results back. We  
24 have enough indicators to make us believe that we need  
25 to go --

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1 CHAIRMAN WALLIS: I think the industry  
2 response to the public comments was everything is  
3 fine, we're doing the right thing now. You just want  
4 the assurance that it really is so.

5 MR. MAYFIELD: That might be the outcome.  
6 And we'll have to see what actually comes in.

7 MEMBER SIEBER: The third question sort of  
8 tips your hand as to what you want. And it says if a  
9 monitoring or surveillance program is not in place,  
10 explain why such a program is not necessary.

11 In other words, here's a plant with  
12 failures. And they're not testing anything.

13 MR. MAYFIELD: We might want to chat with  
14 them a bit.

15 MEMBER SIEBER: You gave them the hint.  
16 You ought to test something.

17 MEMBER BONACA: Or you may have a plant  
18 where there have been no failures and you have no  
19 significant power equipment. Then why should you even  
20 have a test? I mean, then you have a threshold for  
21 saying, "We don't need it."

22 MEMBER MAYNARD: I've got a feeling when  
23 you get all of this, the actual number of failures if  
24 you divide it by the number of plants and the number  
25 of operating years wouldn't look that great, but when

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1 you go to group them, there may be some areas where  
2 you --

3 MR. MAYFIELD: Exactly. And that is not  
4 an uncommon outcome from getting this kind of  
5 information.

6 MR. KOSHY: One thing you find out is the  
7 data that we have at this time is based on normal run  
8 and surveillances, not an extended use of like two,  
9 three weeks. So what we are trying to see is gain  
10 confidence that these cables can continue in service  
11 for two or three weeks if there is a station blackout  
12 or some reason and we can continue to rely on these  
13 cables for that safety function.

14 MEMBER BONACA: Yes. That is a very  
15 important issue, you know, the failure to run. So the  
16 equipment starts, but then it won't run for as long as  
17 it has to. And that's trickier because, I mean, the  
18 number of failures experienced to date doesn't give  
19 you a specific insight on these cables. And that's  
20 their function.

21 MR. KOSHY: Right.

22 MEMBER BONACA: Any additional questions?

23 (No response.)

24 MEMBER BONACA: If not, I thank you for  
25 the presentation.

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1 MR. KOSHY: Thank you.

2 MEMBER BONACA: I think Mr. Marrion of NEI

3 --

4 MR. MARRION: Yes.

5 MEMBER BONACA: -- would like to make a  
6 statement. NEI, of course, produced that white paper  
7 that is quite interesting on this issue.

8 MR. MARRION: Good afternoon. I'm Alex  
9 Marrion, the Senior Director of Engineering at NEI.

10 I do have a couple of comments I want to  
11 make about basically what we heard. We haven't seen  
12 the staff disposition of the public comments that have  
13 been submitted. Nor have we seen the current version  
14 of the proposed generic letter.

15 But I have to tell you I am confused. And  
16 the reason for that confusion is that a couple of  
17 years ago, I received a letter from the Electric  
18 Systems Branch Chief articulating concern with a  
19 potential common mode of medium voltage cables. And  
20 the common mode failure mechanism was water training.  
21 This was based upon a review of 20-some odd licensee  
22 event reports.

23 We had a public meeting with the staff to  
24 understand, get a little more of an understanding of,  
25 their concerns. And we looked into the licensee event

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1 reports, and they had -- I'm trying to remember. I  
2 think there was only one or two that had a potential  
3 for being related to the water-training phenomenon  
4 that the staff was concerned with.

5 But it became clear to us that we needed  
6 to develop a document that would be an educational  
7 piece, if you will, primarily focusing for the  
8 industry, but we also felt that the NRC could possibly  
9 benefit from it. And that was the basic objective for  
10 the white paper that we developed.

11 The purpose for the educational piece was  
12 to articulate a clear understanding of the  
13 water-training phenomenon to articulate our assessment  
14 of the licensee event reports that the staff was using  
15 as a basis --

16 CHAIRMAN WALLIS: You're talking about a  
17 water-training phenomenon?

18 MR. MARRION: Water training, yes.

19 CHAIRMAN WALLIS: Training. Oh, I'm  
20 sorry.

21 MR. MARRION: Yes, water training. I'm  
22 sorry. I've got a cold, and I'm a little congested.  
23 I apologize.

24 CHAIRMAN WALLIS: That's my  
25 misunderstanding. I'm sorry.

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1 MR. MARRION: -- and also provide us a  
2 technically based understanding of the application of  
3 that phenomenon to basic cable configurations and  
4 insulation systems that exist in the power plants  
5 today or not in the power plants but exist in these  
6 applications today.

7 We concluded that you can't make a general  
8 statement that water training is of concern because  
9 it's not applicable to every cable configuration and  
10 insulation system that's in the field today.

11 It appears that the staff is attempting to  
12 require a cable-monitoring program. I'm not familiar  
13 with the details of the maintenance rule, but I know  
14 that the equipment to which these cables are  
15 terminated are monitored in the maintenance rule.

16 And since the cables aren't active  
17 components, I'm not sure whether they should be  
18 included in the maintenance rule or not. But  
19 fundamentally if the staff expectations and basis in  
20 this generic letter are not clear, you have the  
21 potential of a generic letter basically undermining a  
22 regulation.

23 I don't know if the staff has done a  
24 review with the maintenance rule folks within NRR, but  
25 I would recommend that be done before this is

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1 submitted.

2 CHAIRMAN WALLIS: You're implying this,  
3 but, in fact, they just say they're gathering  
4 information. And it's not clear that they intend to  
5 do anything which would change the regulation in any  
6 way or interfere with regulation. You don't know what  
7 they're going to do.

8 MR. MARRION: And the licensee has to  
9 document a justification of why they don't have a  
10 cable-monitoring program. That is --

11 CHAIRMAN WALLIS: But you're implying that  
12 something downstream is going to require this. That's  
13 not actually a --

14 MR. MARRION: No. I'm implying there may  
15 be a conflict between what the generic letter is  
16 asking for and what is required by the --

17 CHAIRMAN WALLIS: You're asking for  
18 information, rather.

19 MR. MARRION: Well, okay. That's one way  
20 of looking at it. It is a request for information or  
21 an attempt to require a cable-monitoring program. And  
22 I'll let you folks decide how you want to do that if  
23 they want to interpret that.

24 I think that, you know, the staff has made  
25 some comments about, you know, what their concern is.

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1 And it's not clear to me. I have to tell you I'm  
2 confused. Maybe it's because of our involvement over  
3 the past several years, but I have yet to see any kind  
4 of risk analysis or any kind of statistical analysis  
5 conducted by the NRC to articulate some level of  
6 confidence that they find unsatisfactory relative to  
7 the performance of the cable or the equipment.

8 We have attempted to do some statistical  
9 work in our white paper based upon the survey that we  
10 had conducted. I'm not happy with the fact that we  
11 didn't get 100 percent of the utilities to respond,  
12 but we got on the order of 80 percent, I think, 79.  
13 something. That has some benefit.

14 My concern at this particular point is  
15 when the generic letter is finally issued, based upon  
16 what I heard this afternoon, we're going to have to  
17 request a meeting, a public meeting, and probably  
18 document further clarification of what the NRC is  
19 really interested in this information request as they  
20 go forward because it's not clear at this particular  
21 point in time. And that's all I have to say. I would  
22 be more than happy to answer any questions you may  
23 have.

24 (No response.)

25 MR. MARRION: Okay. Thank you.

1 CHAIRMAN WALLIS: You're welcome.

2 You were suspicious that if they gather  
3 this information, then they might use it to require  
4 something which they wouldn't be able to do if they  
5 didn't have the information?

6 MR. MARRION: No. It's not clear what  
7 concern is trying to be addressed by the request for  
8 information.

9 CHAIRMAN WALLIS: Well, the concern is  
10 that these cables will fail. It's a simple concern.

11 MR. MARRION: Well, where does that  
12 concern stop? Do you stop at these cables or do you  
13 continue that concern at the equipment, et cetera,  
14 that is under continuous surveillance programs and  
15 testing? I mean, where does it end?

16 And it's a concern about having possible  
17 unanticipated failures? Well, where do you stop  
18 asking that question now that you started on medium  
19 voltage cables and the small population of medium  
20 voltage cables, I suspect?

21 So there are some real issues that have to  
22 be addressed here because the utilities are going to  
23 want to be responsive to the generic letter. My job  
24 is to make sure that we understand it adequately so  
25 the utilities will be responsive, but right now I'm

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1 not sure we have that understanding.

2 MEMBER BONACA: Well, if I understand it,  
3 I mean, the issue has to do with two things. One is  
4 inaccessible equipment that cannot be visually or  
5 other means inspected -- so it's a very narrow family  
6 -- and then equipment that is really in accepted  
7 applications.

8 And clearly equipment is seeing a water  
9 condition or wetness that -- so it's a pretty unique  
10 and narrow population, but I think at least I am  
11 interested to know what kind of equipment is being  
12 powered by this kind of cable out there. And if it is  
13 something critical, a generic letter or whatever,  
14 connection to off-site power, you know, it's a unique  
15 concern.

16 I mean, we addressed it and discussed it  
17 during license renewal because it was significant.  
18 And the industry and the NRC worked together on a goal  
19 inspection program for those cables.

20 And where does the aging start? I mean,  
21 does it start with a theatre of operation or does it  
22 start before? Clearly there is degradation taking  
23 place at some point. I realize I don't know all there  
24 is necessary to know about that.

25 MR. MARRION: If I may just offer a couple

1 of comments?

2 MEMBER BONACA: Yes?

3 MR. MARRION: The aging phenomenon begins  
4 from the time that the cable is shipped from the  
5 manufacturer's facility.

6 MEMBER BONACA: That's right.

7 MR. MARRION: And it's exacerbated by  
8 environmental conditions as well as operational  
9 conditions that wind up stressing the cable insulation  
10 system. And a submerged, wetted environment for  
11 certain insulation systems has the potential of  
12 increasing the aging or the rate of aging degradation,  
13 et cetera. That is well-known.

14 The equipment that's affected here  
15 includes diesel generators at some plants at 4,000 or  
16 4,160 volts as well as other plants at 6.9 kV. I  
17 don't know about -- I think one of the staff was --  
18 Tom made a comment about some diesel generators  
19 operating in the 480 volts. If that's indeed the  
20 case, then that's indeed the case.

21 But mean voltage cable in the industry is  
22 characterized as 2,000 to 15,000 volts. So I'm hoping  
23 that the generic letter will be very clear of  
24 articulating the 480-volt applications. And is it  
25 only for that particular piece of equipment or is it

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1 for something else? That's one of the points of  
2 clarity that's needed.

3 We tried to capture in our white paper --  
4 and I hope you've read it; we've made it available to  
5 you -- the current state of understanding of cable  
6 insulation systems at this voltage level and  
7 underground applications and which insulation systems  
8 are susceptible to water damage over time.

9 We have encouraged the utilities to  
10 prepare for such failures because if you look at the  
11 age of the fleet, we are approaching the end of  
12 service life of a lot of these cables. It's typically  
13 30, 35, 40 years based upon normal environmental  
14 conditions.

15 And our recommendation to the industry was  
16 don't wait for a failure before you have to deal with  
17 this problem because this is not the kind of cable  
18 that you typically keep large quantities in inventory  
19 at the warehouse, et cetera. And if you're not  
20 prepared, you will have an extended outage should you  
21 have such a failure.

22 I don't know if the generic letter is  
23 going to speak to that, but I also know that there is  
24 not a cable-monitoring system that is applicable and  
25 effective and available to the utilities today.

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1           There are some testing techniques that are  
2 effective for certain kinds of insulation  
3 configurations. And our white paper speaks to that.  
4 But based upon the information I have gotten from  
5 EPRI, who is pursuing research in this area, et  
6 cetera, that there isn't one technique that would be  
7 useful. So okay?

8           MEMBER BONACA: Thank you.

9           MR. MARRION: Thank you.

10          MEMBER BONACA: Yes. I think we're  
11 scheduled for some closing remarks. Is there?

12          MR. MAYFIELD: Just very briefly. We  
13 believe we have articulated why we need the generic  
14 letter. If indeed there is substantive confusion or  
15 misunderstanding once we have published the generic  
16 letter, we would, as always, be more than willing to  
17 meet with the industry and make sure that there is a  
18 common understanding of what we're asking for.

19          This generic letter has been in process  
20 for a while. And we do believe we need to move  
21 forward to get the generic letter published and allow  
22 licensees the opportunity to engage with it. We will  
23 be mindful of any conflicts with other generic  
24 communications that are going forward where we may be  
25 imposing unreasonable time constraints and resource

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1 constraints on the licensees. That's something that  
2 we will pay attention to and go back and pulse with  
3 the generic communication staff and the other  
4 technical staff to make sure we're online there.

5 With that, unless the Committee has other  
6 questions for the staff, I believe we have presented  
7 to you the information that we wanted to present. And  
8 we look forward to receiving a letter from you. Thank  
9 you.

10 MEMBER BONACA: Any other questions for  
11 Mr. Mayfield?

12 MR. FALLON: I have a question. Mike  
13 Fallon with Constellation Energy.

14 For the license renewal applicants that  
15 have submitted under the GALL report, these cables are  
16 all in the scope of license renewal, have been  
17 addressed in their applications. Are they being asked  
18 to resubmit this information again?

19 MR. KOSHY: This is Thomas Koshy.

20 This generic letter will fall under the  
21 Part 50 program, in which case we are addressing,  
22 let's say, something more than what was addressed in  
23 the renewal program. So there is a need for making  
24 separate submittal to the NRC in response to this  
25 generic letter.

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1 MR. FALLON: All of the cables that you  
2 have addressed, all of the safety-related cables, are  
3 in the scope of license renewal. And whether they're  
4 480-volt or they're medium voltage, they're addressed  
5 in those applications.

6 MR. MAYFIELD: Okay. Let me comment.  
7 This is Mike Mayfield from the staff.

8 You raise a good point. It is something  
9 we will look at and make sure we're not asking you to  
10 unnecessarily duplicate information. But that is a  
11 fair question, something that we'll make sure that --

12 MEMBER BONACA: Well, I am not aware that  
13 license renewal applications have the summary of all  
14 of the failures that have taken place. We are going  
15 to get to the information.

16 MR. MAYFIELD: We don't think we are in  
17 conflict, but it's a fair question. And we'll look to  
18 make sure we are not asking an unreasonable question.

19 CHAIRMAN WALLIS: But you will be looking  
20 at plants which doesn't necessarily have license  
21 renewal in prospect.

22 Are we through with this item now or --

23 MEMBER BONACA: Are there additional  
24 questions for the staff, for industry, for us?

25 (No response.)

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1 MEMBER BONACA: If none, I think it's  
2 over.

3 CHAIRMAN WALLIS: Thank you.

4 MEMBER BONACA: And we open it up back to  
5 you, Mr. Chairman.

6 CHAIRMAN WALLIS: Now, I really am  
7 reluctant to take a break for an hour. I wonder if we  
8 couldn't work on -- is it okay, staff who is an expert  
9 on this? Can we work on Mario's letter on this issue  
10 right now on just a preliminary basis?

11 Let's go off the record and work on his  
12 letter for half an hour or an hour.

13 MEMBER SIEBER: We have to come back.

14 CHAIRMAN WALLIS: Can we do that? You're  
15 not ready? We do have a draft letter. Will the  
16 Committee agree to work on his letter? We can discuss  
17 it now, but I think we can go off the record and  
18 discuss our reaction to this generic letter and work  
19 on our letter until about 3:00 o'clock. Is that okay  
20 with the Committee?

21 So let's do that. We'll come off the  
22 record now, and we will work on this letter until  
23 about 3:00 o'clock. We'll have some discussion now  
24 off the record.

25 (Whereupon, the foregoing matter went off

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1 the record at 2:25 p.m. and went back on  
2 the record at 3:18 p.m.)

3 CHAIRMAN WALLIS: We will come back on the  
4 record, come back into session.

5 CHAIRMAN WALLIS: The next item on the  
6 agenda is, let's see now, interim staff guidance. Is  
7 that what it is?

8 MEMBER BONACA: Yes.

9 CHAIRMAN WALLIS: And I will again call on  
10 Mario Bonaca to lead us through this one.

11 MEMBER BONACA: Okay.

12 4) INTERIM STAFF GUIDANCE AGING MANAGEMENT PROGRAM

13 FOR INACCESSIBLE AREAS OF BOILING WATER REACTOR

14 (BWR) MARK I CONTAINMENT DRYWELL SHELL

15 4.1) REMARKS BY THE SUBCOMMITTEE CHAIRMAN

16 MEMBER BONACA: We have the staff here to  
17 provide us with an overview on the proposed license  
18 renewal interim staff guidance on steel containment of  
19 BWR Mark I containments.

20 We have reviewed a number of BWRs. And  
21 we have often asked the question on the status of the  
22 steel liner. And we have seen different proposals by  
23 licensees, some of them planned inspections, only  
24 metric inspections. Some of the others don't.

25 And the staff is using a successful

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1 process that has been successful in most of the  
2 license renewal applications to date, the ISG process,  
3 as a means of proposing an approach that they expect  
4 the licensees to follow regarding this particular  
5 item.

6 And so the staff has come here to give us  
7 an overview of this process and what they are  
8 proposing to do. And I will let the staff go ahead.  
9 I don't know if Mr. Gillespie or Mayfield --

10 MR. GILLESPIE: Yes. If I could, just  
11 some opening comments to put in context what Linh and  
12 Hans are going to go through. Not only did we do a  
13 couple already, but we've got something like seven  
14 Mark I's lined up in the queue. And we have a number  
15 of very controversial ones in New Jersey,  
16 Massachusetts, and Vermont, where there is actually a  
17 lot of public interest. And we had no position on the  
18 liner itself.

19 There are some caveats or I'm going to say  
20 some wiggle room in this position I'd like to  
21 highlight to the Committee by way of how the staff is  
22 approaching this because a question at the meeting  
23 yesterday at Monticello was, why is it different plant  
24 to plant if you're trying to apply a consistent  
25 approach.

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1           This is kind of an approach for the plant  
2           that's got almost like the optimum conditions, of  
3           which Monticello with their leakage control programs  
4           and some things they were doing was.

5           Browns Ferry, an earlier one, which  
6           committed to doing some other measurements, actually  
7           had an operating history of having leaks. And so they  
8           had moisture content in there. And so we actually  
9           have -- this is a minimum condition, as we would look  
10          at it.

11          And there are also some wiggle words,  
12          quite honestly, in this. And that's where it says  
13          first you have to establish a degradation rate,  
14          basically. And then if you get moisture, this  
15          basically treats moisture in the outside of the shell  
16          the same as visible accelerated corrosion on the  
17          inside.

18          And we're using the ASME code kind of  
19          enhanced inspection, but, instead of referencing the  
20          code, we described the enhanced inspection in it in  
21          case the code changes in the future.

22          So we're bringing definition to an  
23          equivalence to inside and outside indications. And  
24          there is still a lot of room on how you establish the  
25          rate and what is the credibility of the rate.

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1           And so if you have a history as a facility  
2 of having leakage and, therefore, moisture in there,  
3 then I think the Committee should expect the staff in  
4 establishing the rate in those wiggle rooms because it  
5 says if you have moisture, reestablish your rate again  
6 -- and the only way to factually reestablish the rate  
7 is likely do a UT measurement and then connect the  
8 dots again. Literally a simplistic way of looking at  
9 it is a regression line between the now additional  
10 point.

11           And so Hans in his efforts as a reviewer  
12 still has a lot of room in what are the uncertainties  
13 in establishing the rate. And it's those  
14 uncertainties which kind of differentiate one plant  
15 from another. How do you reduce those uncertainties  
16 given different operating histories?

17           And so that's really how come Monticello  
18 is different from Browns Ferry. It's strictly  
19 operating history and the uncertainty involved with  
20 known moisture leak on multiple occasions.

21           So, with that, let me turn it over to Linh  
22 because that's just kind of the context. Linh, take  
23 it away.

24           4.2) BRIEFING BY AND DISCUSSIONS WITH  
25           REPRESENTATIVES OF THE NRC STAFF

1 MS. TRAN: Good afternoon. My name is  
2 Linh Tran. And I'm the Project Manager with the  
3 Division of License Renewal. And this is Hans Ashar.  
4 He's a senior civil engineer with the Division of  
5 Engineering.

6 We are here this afternoon to present the  
7 proposed license renewal interim staff guidance for  
8 the inaccessible area of the BWR Mark I drywell  
9 containment shell.

10 The purpose of this ISG is to provide  
11 guidance to future applicants on the information that  
12 is needed to be included in the license renewal  
13 applications for addressing the inaccessible area of  
14 the drywell shell.

15 Now, the proposed ISG here does not impose  
16 any no new technical requirement. And in previous  
17 license renewal application review by the staff, we  
18 usually can obtain the information in the applications  
19 or through the request for additional information.  
20 And usually we will get the information from the  
21 applicant.

22 The information provided by the applicant  
23 is sufficient for the staff to make its determination.  
24 However, it is not the most efficient way because of  
25 the RAI back and forth. And in an effort to reduce

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1 the number of RAIs, this proposed ISG would identify  
2 the information up front, so for the future  
3 applicants, what they should include in the LRAs, I  
4 guess, to make the staff review more efficient,  
5 information such as inspection results or analysis  
6 that would help the staff make the determination  
7 whether the containment would perform its intended  
8 function for the period of extended operation.

9 Past operating experience in the Mark I  
10 steel containments indicate that when water is  
11 discovered in the bottom outside area of the drywell  
12 shell, the most likely cause could be the water  
13 seeping through the inaccessible area.

14 And in slide 10 in your handout, I have a  
15 picture of the drywell shell. It is an inverted light  
16 bulb. That indicates where the inaccessible area  
17 would be.

18 And this area is the area for the distance  
19 between the drywell shell -- did you do slide 10?;  
20 that's a picture there; yes -- where the surrounding  
21 concrete structure is too small for successful  
22 performance of visual inspection. That's the area  
23 right there. The gap is usually two inches, three  
24 inches.

25 CHAIRMAN WALLIS: You used the term

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1 "seeping." It's really any water that gets there from  
2 any reason whatsoever.

3 MS. TRAN: Correct.

4 CHAIRMAN WALLIS: And "seeping" is used as  
5 a general term.

6 MS. TRAN: Term, correct.

7 CHAIRMAN WALLIS: It may not seep. It may  
8 actually flow or --

9 MS. TRAN: Flow through, right.

10 MR. ASHAR: The area that we are  
11 concentrating on is between the shell, between the  
12 shell and the concrete in the back, in between the  
13 insulation --

14 MEMBER BONACA: No, no, no.

15 MR. ASHAR: Oh, I'm sorry. Wrong place.

16 MS. TRAN: Right. That's --

17 MEMBER APOSTOLAKIS: It is between what  
18 and what?

19 MR. ASHAR: Between the freestanding steel  
20 containment --

21 MEMBER BONACA: Between the light bulb and  
22 the --

23 CHAIRMAN WALLIS: There's a space right  
24 there.

25 MR. ASHAR: And mostly it is filled with

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1 insulation.

2 MEMBER APOSTOLAKIS: How does the water  
3 get there?

4 MR. ASHAR: Water gets into -- I'm going  
5 to explain. There are three basic sources of water  
6 that we have seen so far in the operating history.  
7 One can be called because of the -- we don't have any  
8 picture of the actual area.

9 MS. TRAN: No. This is it.

10 MR. ASHAR: This is it. In this area,  
11 there are bellows, bellows between the driver.

12 CHAIRMAN WALLIS: We saw them this  
13 morning.

14 MR. ASHAR: Yesterday you may have seen  
15 it, yes. And those bellows can crack. And then they  
16 can give a seepage into the trough, which collects the  
17 water.

18 Now, if the drain, which is supposed to  
19 drain out all the water from there, is full or is not  
20 working properly, the water can accumulate in the  
21 trough area, which has been kept just for that  
22 purpose. And it may all flow in coming to this area  
23 here.

24 CHAIRMAN WALLIS: It's lower.

25 MR. ASHAR: Because it is not showing

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1 better this particular detail, this is not good  
2 enough. Yesterday it was a very nice picture here.

3 CHAIRMAN WALLIS: But in order to refuel,  
4 you have to flood the upper region there.

5 MR. ASHAR: That is correct.

6 CHAIRMAN WALLIS: And some of that water  
7 can get down on the outside.

8 MEMBER APOSTOLAKIS: Okay. Thank you.

9 MS. TRAN: Now, in this --

10 VICE CHAIRMAN SHACK: Now, is that the  
11 only source of the water, I mean?

12 MR. ASHAR: No, no. There are two or  
13 three we found so far. Okay? One is a cracking of  
14 bellows. Second one is there is a refueling seal  
15 between the bottom of the trough, concrete trough.  
16 And there is a systematic way of draining it out  
17 through a drainage. But drain gets clogged. And the  
18 water comes through that area. It collects in the  
19 trough again and goes into between the concrete and  
20 the drywell shed.

21 Clog one is the reactor cavity wall. You  
22 have a stainless steel liner on it. And stainless  
23 steel liner gets -- they may do for any reason. And  
24 the water goes directly from concrete into that gap in  
25 between the two.

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1                   These are three reasons we have identified  
2                   so far.

3                   CHAIRMAN WALLIS:   So what clogs this  
4                   drain?  You said the drain gets clogged?

5                   MR. ASHAR:  It is because of negligence on  
6                   the part of the various --

7                   CHAIRMAN WALLIS:  Yes.

8                   MR. ASHAR:  -- not to monitor them  
9                   correctly.  Now they have come to their senses.  And  
10                  they started telling us they are monitoring, they are  
11                  doing this, they are doing that.

12                  MEMBER BONACA:  The drains are down from  
13                  the sand cushions, right?

14                  MR. ASHAR:  They are separate.  After the  
15                  water leakage, it is the sand cushion area.  Then  
16                  there are drains to -- actually, those drains were  
17                  meant for making sure the scent does not go away.  And  
18                  if it is, then they can collect them and put them back  
19                  the same.  That was the whole idea behind it.

20                  But it has been used nowadays as a  
21                  water-collecting/catching kind of a thing.  It is an  
22                  indirect function of that particular drain, but that  
23                  shows that water is coming in.  If the drains into  
24                  that room, if it shows any kind of water in the Torus  
25                  room, then it shows that there is a water leakage from

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1 somewhere up above that is getting into that area.

2 CHAIRMAN WALLIS: It drains into the room  
3 around the Torus? It just drips down the wall  
4 somehow?

5 MEMBER SIEBER: Yes.

6 MR. ASHAR: The water comes from here.

7 CHAIRMAN WALLIS: That is a four-inch  
8 drain pipe. It just drains down the wall?

9 MR. ASHAR: This is a sand pocket here.

10 CHAIRMAN WALLIS: Where does it go to when  
11 it drains out of that four-inch drain pipe?

12 MEMBER SIEBER: Onto the floor.

13 CHAIRMAN WALLIS: It just drains onto the  
14 floor?

15 MR. ASHAR: Unless they are collectors.  
16 Some people have started collecting them into some  
17 kind of a jar. But most of them, yes, it was going  
18 onto the floor.

19 MS. TRAN: It goes onto the floor, yes.

20 MR. ASHAR: There is where they find out.

21 MEMBER BONACA: Now, some licensees have  
22 the drainage and some don't. That depends on the --

23 MR. ASHAR: Well, some licensees have  
24 drains of the sand pocket area here.

25 MEMBER BONACA: Down at the low point.

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1 MR. ASHAR: Some people have drains at  
2 this area somewhere on the top of it.

3 MEMBER SIEBER: I think all of them --

4 MR. ASHAR: And if it is on the top of it,  
5 then there has to be sealing between --

6 MEMBER SIEBER: All of them have the top.

7 MR. ASHAR: -- the concrete and the --  
8 yesterday we saw in the Monticello case, it was a  
9 seal, which was a galvanized steel shield between the  
10 sand pocket area and the above area. So it prevents  
11 the water from getting in.

12 MEMBER BONACA: The had a few ounces of  
13 water, too, at some point.

14 MR. ASHAR: Yes, yes.

15 MEMBER BONACA: So they must have come  
16 also from the top.

17 MR. ASHAR: In the case of Monticello,  
18 there were no signs like that. We did not see.

19 MEMBER BONACA: There were only a few  
20 ounces of water, they said.

21 MEMBER MAYNARD: Yes, but they speculated  
22 that that water had actually come from another source  
23 because of the two or three-inch sand pipe there.

24 MEMBER BONACA: On the sand pipe there,  
25 yes.

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1 MR. ASHAR: They could explain when you  
2 ask that question.

3 CHAIRMAN WALLIS: Well, if it drains down  
4 that four-inch drain pipe, I would assume that the  
5 sand is full of water.

6 MEMBER SIEBER: Yes.

7 MEMBER MAYNARD: Right. That is not the  
8 low point.

9 CHAIRMAN WALLIS: There is a lot of water  
10 there before it drains down the pipe. The sand  
11 pocket, the sand --

12 MR. ASHAR: The sand pocket has to be  
13 sucked up completely.

14 CHAIRMAN WALLIS: The sand cushion is  
15 saturated with water first.

16 MR. ASHAR: Right.

17 MEMBER SIEBER: A number of plants have  
18 drains at the bottom of the sand --

19 MR. ASHAR: At the bottom --

20 MEMBER SIEBER: It would make more sense  
21 to --

22 MR. ASHAR: Some people have at the bottom  
23 of the sand pocket area drains with -- again,  
24 actually, it is to retain the sand inside. So that  
25 all flowing sand can be collected, but if they can use

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1 it at the --

2 MEMBER SIEBER: What is the purpose of the  
3 sand in the first place?

4 MR. ASHAR: Okay. See, this is the --

5 MEMBER SIEBER: Got a cushion?

6 MR. ASHAR: -- concrete area -- okay? --  
7 here. And this one when the shell expands under  
8 pressure --

9 MEMBER SIEBER: It is room to --

10 MR. ASHAR: -- it gives you some room to  
11 budge in.

12 MEMBER SIEBER: Expand? Okay. But the  
13 whole bottom of the shell sits on concrete? So you  
14 don't worry about corrosion below the sand?

15 MR. ASHAR: We do in some cases. We do to  
16 some extent, yes. If --

17 MEMBER SIEBER: How do you address that?  
18 You can't get to it because the top of it is concrete,  
19 too.

20 MR. ASHAR: If there is an appreciable  
21 collection of water in the sand bucket area, there is  
22 a chance that the water might have gone between the  
23 steel shell and the concrete.

24 MEMBER SIEBER: Right.

25 MR. ASHAR: But those cases, we have not

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1 found many so far except one, one case.

2 MEMBER SIEBER: You probably don't know --

3 MR. ASHAR: Yes, sir.

4 MEMBER SIEBER: -- you've got a concrete  
5 pad, a hemispherical pad, and then concrete above  
6 that.

7 MR. ASHAR: Right.

8 MEMBER SIEBER: And so there's no way to  
9 make a measurement.

10 MR. ASHAR: We know.

11 MS. TRAN: The interior.

12 MEMBER SIEBER: You can't get to the  
13 inside unless you cut the concrete out.

14 MR. ASHAR: Unless you cut the concrete or  
15 there are some new methods that have been developed in  
16 the NRC's research program, which have guided matters,  
17 but they are not yet being calibrated and haven't been  
18 used extensively by anybody.

19 So there are potential uses for those  
20 things under these examinations, but we have not seen  
21 them use it so far. We have just put one report from  
22 Oak Ridge National Lab in e-mail items so that people  
23 can look at that report and see if it is applicable  
24 for them.

25 CHAIRMAN WALLIS: Didn't someone yesterday

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1 say they actually made holes in that concrete in order  
2 to inspect?

3 MR. ASHAR: Yes.

4 MS. TRAN: Monticello.

5 MEMBER SIEBER: Next to the pedestal.

6 MR. ASHAR: Yes. They had to do that.

7 MEMBER SIEBER: But that is about as far  
8 as you can go because --

9 MR. ASHAR: That is as far as you can go  
10 right now, right.

11 MEMBER SIEBER: It's really thick in  
12 between.

13 MR. ASHAR: Yes. You can go up to here in  
14 the sand pocket area. Anything below that, if there  
15 is a --

16 MEMBER SIEBER: Of course, the sump is in  
17 there, too.

18 VICE CHAIRMAN SHACK: But typically,  
19 though, I mean, your experience is that there is no  
20 water there or that they all collect water?

21 MR. ASHAR: Typically the water has been  
22 very little. There has been water except in one case  
23 in the case of, I think it is, Dresden III, when they  
24 had to put firewater in here to extinguish a fire in  
25 the gravel area here --

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1 VICE CHAIRMAN SHACK: Well, that would do  
2 it.

3 MR. ASHAR: -- because of a summation  
4 fire. I don't know why.

5 MEMBER SIEBER: Good place to get a fire.

6 MR. ASHAR: But there was a fire there.  
7 They put a lot of water into it. And this whole area  
8 becomes soft here in the sand --

9 CHAIRMAN WALLIS: I'm interested to see  
10 when the sand gets full of water by some mechanism how  
11 it ever gets out. How does it ever get dry?

12 MR. ASHAR: With sand you --

13 CHAIRMAN WALLIS: If you had water access,  
14 suppose the bellows fails --

15 MR. ASHAR: Except the temperature --

16 CHAIRMAN WALLIS: -- water runs down.

17 MEMBER SIEBER: Aren't there drains at the  
18 bottom of this thing pushing it, right?

19 MR. ASHAR: Some have. This one is not  
20 shown here. There is a drain right here.

21 CHAIRMAN WALLIS: There is a drain there?

22 MR. ASHAR: There is a drain.

23 MEMBER SIEBER: Okay.

24 CHAIRMAN WALLIS: So that is how you draw  
25 out the sand? You just let it soak out?

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1 MEMBER SIEBER: It drips into where the --

2 MR. ASHAR: The temperature in the drywell  
3 in general in that area is close to about 130-140  
4 degrees. So it helps a little bit drying --

5 CHAIRMAN WALLIS: It evaporates the water?

6 MR. ASHAR: To some extent, not -- I mean,  
7 I have been given those explanations by various  
8 applicants, I know, what does this, but I do not  
9 believe everything they say. But --

10 CHAIRMAN WALLIS: Okay.

11 MS. TRAN: Slide five, please.

12 MEMBER SIEBER: You say the space between  
13 the concrete and the shell and the drywell is filled  
14 with insulation.

15 MR. ASHAR: Yes, there is insulation in  
16 there.

17 MEMBER SIEBER: What is it, some kind of  
18 fiber of some sort?

19 MR. ASHAR: I think so, yes. In one case  
20 we found that insulation was bad enough that it has  
21 chloride and all those contaminants. So when the  
22 water came in, it came with contaminated water. And  
23 that started accelerating the corrosion rate.

24 MEMBER SIEBER: That would do it. The  
25 insulation holds the water all up and down.

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1 MR. ASHAR: Up and down.

2 MR. GILLESPIE: Hans, I think it is  
3 important here that we're not talking in every case  
4 about any single containment.

5 MR. ASHAR: Right.

6 MR. GILLESPIE: What you have hit on is  
7 exactly what I tried to say in the beginning. The  
8 specific designs are so variant that we have really  
9 found out in doing these reviews that a Mark I  
10 containment is not a Mark I containment when you're  
11 looking at the drain details and the drain location.  
12 It's a function of the age, the AE. And, for example,  
13 Nine Mile actually put cameras up to ten-inch drains  
14 that they have and looked up in there, and it was  
15 dust.

16 And so before we assume that this thing is  
17 always full of water on everyone, there is a great  
18 variance between each unit. The design is different.  
19 And what licensees have done in the past to verify  
20 either the presence or absence of water is very  
21 different.

22 And so it's not like there is a universal  
23 answer to each one of these. Each one really is  
24 different.

25 VICE CHAIRMAN SHACK: Now, again, just on

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1 that, are all of the ones filled with insulation or  
2 are some of them actually air gaps?

3 MEMBER ARMIJO: I thought Monticello was  
4 an air gap based on yesterday's presentation.

5 MR. ASHAR: It is called air gap. I mean,  
6 in general, the terminology used is air gap.

7 VICE CHAIRMAN SHACK: But, I mean, is it  
8 typically filled with insulation?

9 MR. ASHAR: Typically it is a concrete  
10 General Electric design. It has the insulation in  
11 most cases. There might be a plant or two that may  
12 not have it available, but there might be some plants.

13 MEMBER SIEBER: You almost need it to be  
14 the form for pouring the concrete.

15 MR. ASHAR: Right, exactly.

16 MEMBER SIEBER: You need something in  
17 there to do that. Otherwise you don't have a gap at  
18 all. And one of the ways you get water down there is  
19 you have to take that refueling seal out after you  
20 refuel in order to put the drywell back together. And  
21 the process of doing that leaves a lip of water --

22 MR. ASHAR: Right.

23 MEMBER SIEBER: -- all around where the  
24 seal --

25 MR. ASHAR: Right.

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1 MEMBER SIEBER: -- used to be. It can  
2 only go down.

3 CHAIRMAN WALLIS: Now, we had a plant  
4 recently which had bulges in this realignment.

5 MR. ASHAR: I want to clarify two things.  
6 Okay?

7 CHAIRMAN WALLIS: It was Brunswick.

8 MR. ASHAR: There is a problem with the  
9 terminology. The first thing, when we talk about the  
10 drywell shell, it is a freestanding drywell steel  
11 shell. And when we talk about the liner, it is  
12 attached to concrete with some kind of anchorages.

13 And that is where we use the word "liner."  
14 But I have seen people using very loosely "drywell  
15 liner" here. It is not true. Okay? We are going to  
16 clarify the terminology in the next -- there is no --

17 MEMBER SIEBER: The one plant that has the  
18 liner, the shell, the structural member is the  
19 concrete, the subject of the code.

20 CHAIRMAN WALLIS: Yes, that's right.

21 MEMBER SIEBER: So you can tolerate some  
22 amount of corrosion as long as you --

23 CHAIRMAN WALLIS: So the liner just sits  
24 on the --

25 MEMBER SIEBER: -- maintain tightness.

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1 CHAIRMAN WALLIS: Okay. So the liner sits  
2 on the concrete, which is why it bulges.

3 MEMBER SIEBER: Just in that one plant.

4 CHAIRMAN WALLIS: This one is  
5 freestanding, this one.

6 MEMBER SIEBER: Yes.

7 MR. ASHAR: The one we are showing is a  
8 freestanding shell plus the liner.

9 MS. TRAN: Okay. Slide five. For some  
10 applications, just the information provided was  
11 included in the various sections of the LRA. And for  
12 other applications, the information was obtained to  
13 request for additional information.

14 As a result, the proposed ISG recommended  
15 that future applicants provide a plant-specific aging  
16 management program that would address the loss of  
17 material for the accessible area of the drywell shell.

18 So the recommendations that the applicant  
19 should be included in there, in the aging management  
20 program to develop a corrosion rate that is really  
21 inferred from past UT examination or establish a  
22 corrosion rate using representative samples in similar  
23 operating condition.

24 CHAIRMAN WALLIS: I would think the  
25 corrosion rate was so low that it would be difficult

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1 to measure. Really, you could say that it's less than  
2 a certain amount.

3 MS. TRAN: Less than, then. No minimum  
4 design.

5 CHAIRMAN WALLIS: That's good enough. You  
6 don't actually want them to determine what it is  
7 because you might be so low that you can't measure it.  
8 But if it's less than a certain amount, that would be  
9 acceptable, wouldn't it?

10 MR. ASHAR: In general, subsection IWE of  
11 the ASME code allows close to about ten percent  
12 allowance --

13 CHAIRMAN WALLIS: I know, but --

14 MR. ASHAR: -- some localized corrosion.

15 CHAIRMAN WALLIS: But if there is no water  
16 there, the corrosion rate may be essentially zero.

17 MS. TRAN: Correct.

18 CHAIRMAN WALLIS: And so establishing a  
19 zero thing is very difficult to do.

20 MEMBER SIEBER: Really, what you are  
21 trying to do is to determine how close you are to  
22 min wall.

23 MR. ASHAR: The min wall, right, minimum  
24 wall.

25 MEMBER SIEBER: And by plotting the

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1 reduction in thickness, you can determine when you are  
2 going to hit min wall. At that point you no longer  
3 meet the code for that pressure vessel.

4 VICE CHAIRMAN SHACK: How do I do this?  
5 Do I have to have multiple UT readings from that  
6 inaccessible portion of the shell? Can I demonstrate  
7 that mine is always dry?

8 MEMBER MAYNARD: You could develop a way  
9 that you had data from the --

10 MR. ASHAR: Two in the same location.

11 MEMBER MAYNARD: If an applicant comes in  
12 and they don't have previous data, I'm not sure how  
13 they develop a rate.

14 MS. TRAN: This is what we learned in  
15 putting this together. They will have one point at  
16 the beginning, you know, the design of the fabrication  
17 point. And then as a result of generic letter 87-05,  
18 most applicants, I mean, yes, have another data point.  
19 So when using that, they could develop some kind of --

20 VICE CHAIRMAN SHACK: Again, that is very  
21 specific. How many data points did they take when  
22 they made those UT measurements? How many locations?

23 MS. TRAN: Eighty-seven? Do you know?

24 MR. ASHAR: Yes. Generally in response to  
25 87-05, a number of -- now I have to say licensees, not

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1 applicants -- licensees have taken that kind of  
2 approach that they will look at four points in four  
3 sectors --

4 VICE CHAIRMAN SHACK: Four quadrants.

5 MR. ASHAR: -- because they don't remove  
6 the sand. They just have the sand. It's not like  
7 Oyster Creek. So what they do is they chip out the  
8 concrete in certain areas and then take the  
9 measurements and in response to 87-05.

10 And the second reading they take is two  
11 years or so after. That gives them a closer rate at  
12 the same location. It isn't delicate science that,  
13 hey, something is going on. Then they do more work.

14 VICE CHAIRMAN SHACK: Now, again, from  
15 Monticello, they don't seem to have maintained those  
16 as access ports.

17 MEMBER SIEBER: No.

18 MR. ASHAR: No, they don't. I mean, they  
19 can get to it if they have to, but they don't maintain  
20 them because they --

21 MEMBER SIEBER: That becomes another  
22 pocket for corrosion --

23 MR. ASHAR: Yes, right. It becomes --

24 MEMBER SIEBER: -- because there is  
25 moisture inside the containment.

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1 MR. ASHAR: Right.

2 MEMBER SIEBER: In the sump is actually  
3 that floor there. The sump is built into the floor.  
4 And so every loose water, amount of water, ends up in  
5 that space where the drywell liner and the concrete  
6 meet.

7 So they have to fill it up. They have to  
8 do something. Otherwise you would have a pocket of  
9 water sitting there.

10 CHAIRMAN WALLIS: I am still a little  
11 puzzled. I would think that the corrosion rate is so  
12 low that it's within the uncertainty in the ultrasound  
13 measurements.

14 MR. ASHAR: If it is low, they will report  
15 as low.

16 MS. TRAN: At least we will have --

17 MEMBER SIEBER: Carbon steel water and --

18 CHAIRMAN WALLIS: There's no water there.

19 MR. GILLESPIE: As it happens with real  
20 applicants, we're looking at corrosion rates like 17,  
21 18 ml a year in some cases.

22 CHAIRMAN WALLIS: There is water there.

23 MR. GILLESPIE: Well, yes. And people are  
24 seeing some evidence of corrosion. In another case,  
25 Nine Mile case, they did these measurements. And then

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1 they have a high-corrosion area on mild carbon steel  
2 at the water line in the Torus.

3 And what they did was they took that rate  
4 as a conservative estimate, where they know water is,  
5 and applied it to their liner and say, "Okay. We've  
6 got 38 years to go here."

7 And so people actually have come up with  
8 ways given these points and other representative  
9 carbon steel areas within their area that they do  
10 measure because they're in harsher environments and  
11 applied that as a representation to this in order to  
12 show that they could make it past the renewal period  
13 or at least until the next measurement that they might  
14 commit to take.

15 And so so far each licensee that we have  
16 had an opportunity to both finish our review or  
17 interface with so far has actually been extremely  
18 consistent with this position. And so they have  
19 actually figured out how to do it.

20 And there is other carbon steel in the  
21 Torus, actually in a wet environment, which gives you  
22 a noticeable rate, as it happens, particularly where  
23 some of the liners have blistered and bubbled, which  
24 is a whole other issue, that they can apply to this.

25 It's a conservative application. You

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1 know, if it doesn't work, then they have to do  
2 something else to convince us that the rate is okay.

3 So when we talk the nebulous philosophy,  
4 it gets harder, but I think when you get to specific  
5 plant situations, pardon the pun, but it's concrete.  
6 And so they have kind of come up with ways to use the  
7 generic point, the generic letter issue points.

8 In fact, in Vermont Yankee's case, they  
9 actually had leakage and did extra measurements  
10 consistent with the ISP, which wasn't issued when they  
11 did this some years ago. And so they have preserved  
12 those extra points.

13 And so it just happens that these plants  
14 actually have this information sitting there. They  
15 just haven't used it in this application before. And  
16 this is clarifying. We expect you to use it in this  
17 application.

18 Go ahead, Linh.

19 MS. TRAN: I guess now where degradation  
20 has been identified in accessible area of the drywell,  
21 meaning in the interior area of the drywell, the  
22 applicant should provide an evaluation that would  
23 address the condition of the inaccessible area of a  
24 similar condition or find something in the interior  
25 area. They should have an evaluation for that.

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1 Now, to assure --

2 MEMBER APOSTOLAKIS: How does one do that?

3 MR. ASHAR: Let me. The actual, this is  
4 just what we have seen.

5 MEMBER APOSTOLAKIS: That's okay. You  
6 don't have to show it.

7 MR. ASHAR: Okay. This is the requirement  
8 we set in after when we endorsed IWE, IWL into  
9 50.55(a) in the rule, that if they find something in  
10 the accessible area, they ought to go and look in the  
11 surrounding inaccessible area to see if there is  
12 anything going on.

13 A lot of PWR licensees, for example, have  
14 found that at the junction of the steel liner of the  
15 concrete containment and the concrete floor, they have  
16 moisture barriers generally. And their moisture  
17 barrier gets damaged. The borated water many times go  
18 in. And it starts corroding the inside area. It  
19 shows up a little bit on the upper side.

20 So they would do examination and find out  
21 what is going on. And they find the moisture barrier  
22 could be the culprit. They have to change the  
23 culprit. They ought to go inside. They ought to take  
24 out the corrosion.

25 So that's the reason this problem has been

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1 in about the inaccessible. In accessible area you  
2 have corrosion. You would look into the joining  
3 inaccessible area to find every --

4 MEMBER APOSTOLAKIS: You will look into  
5 the inaccessible area. That helps make it accessible  
6 or not?

7 MR. ASHAR: No. If you see some rusting  
8 or something on the --

9 MEMBER APOSTOLAKIS: You can look at it.  
10 Why isn't it accessible?

11 MR. ASHAR: No, no. The whole area is  
12 that you see something in an accessible area. And  
13 they investigate as to what is going on underneath  
14 that particular area. The basic focus in the room was  
15 the PWR containments. That is where it was found in  
16 so many of them. And still we are finding it.

17 MEMBER ARMIJO: But it is possible you  
18 could have damage occurring in an inaccessible area  
19 and have nothing in the accessible.

20 MR. ASHAR: That's quite right.

21 MEMBER SIEBER: Possible.

22 MR. ASHAR: That is why this type of --

23 MEMBER ARMIJO: Very possible. I mean,  
24 it's --

25 MS. TRAN: That is why we use accessible

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1 area as the indication for the accessible area for the  
2 augmented inspection. They have to do visual in the  
3 surface. And then if the surface area is accessible  
4 only from one side and they have to protect the wall  
5 thing by using ultrasonic --

6 MEMBER ARMIJO: I don't worry about the  
7 accessible. I just worry about the inaccessible and  
8 having no way of knowing just by looking at the  
9 accessible area. It's not a good --

10 MR. ASHAR: That is where this ISG kicks  
11 in because this ISG is focused on inaccessible area.  
12 This is one of the pointers, that if there is  
13 something going on in the accessible area, which you  
14 can see right away, then there is something going on  
15 and you will look at it.

16 MEMBER ARMIJO: That is the easy part.

17 MR. ASHAR: The ISG concentration, focus  
18 of this ISG, is the inaccessible areas.

19 MEMBER APOSTOLAKIS: But how does one  
20 suspect?

21 CHAIRMAN WALLIS: Yes, that's right. How  
22 does one suspect?

23 MEMBER APOSTOLAKIS: How do you suspect?

24 MS. TRAN: You find water or leakage on  
25 your --

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1 MEMBER APOSTOLAKIS: That is getting back  
2 to what Dr. Armijo is saying. That's not our worry.  
3 What if you don't find water? You still make some  
4 problem in the inaccessible area. Is that correct?

5 MEMBER ARMIJO: Yes, you could.

6 MEMBER APOSTOLAKIS: So how does one  
7 suspect that something is going on in the inaccessible  
8 area?

9 MEMBER BONACA: No. She says water.

10 MS. TRAN: Water is one. If you find  
11 water in the drain lines, water in the drain line, in  
12 the --

13 MEMBER BONACA: For example, if the seals  
14 -- I guess you are focusing on the seals and on the  
15 bellows, right?

16 MR. ASHAR: Right.

17 MEMBER SIEBER: The only way you can get  
18 water into the inaccessible area is to have it flow  
19 through the accessible area. So if you make a  
20 measurement in the accessible area --

21 MEMBER APOSTOLAKIS: Okay. That is a  
22 different --

23 MEMBER SIEBER: -- that gives you some  
24 kind of justification to extrapolate to the area you  
25 get.

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1 MEMBER APOSTOLAKIS: But that doesn't help  
2 much because it could have run down --

3 VICE CHAIRMAN SHACK: The water runs down  
4 and collects at the --

5 MEMBER SIEBER: Right.

6 VICE CHAIRMAN SHACK: It doesn't stay on  
7 the side of the --

8 MEMBER BONACA: That is why the real focus  
9 is the last bullet. And that's what they attempted to  
10 do, you know, to put in the seals and the bellows in  
11 the scope of license renewal. And this has been kind  
12 of debated with the industry.

13 CHAIRMAN WALLIS: This is a very weak  
14 statement, "if moisture is suspected." That's a very  
15 subjective --

16 MS. TRAN: Or detected.

17 CHAIRMAN WALLIS: If you have a suspicious  
18 nature, you would suspect it all the time.

19 MR. ASHAR: Subsection IWE in its  
20 IWE-1240, there's a number of items. This is the  
21 abbreviated form. A number of places where this could  
22 occur is very vividly described in there, IWE-1240 in  
23 the ASME code. And that is what we are invoking, but  
24 we did not write everything that is written in the  
25 IWE-1240.

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1 MEMBER APOSTOLAKIS: Now, you are really  
2 including SSCs that are identified as source of  
3 moisture and scope, source of moisture?

4 MR. ASHAR: Yes. For example, cracking of  
5 bellows.

6 MEMBER SIEBER: The refueling seal.

7 MR. ASHAR: I explained to you earlier.

8 MEMBER APOSTOLAKIS: Okay. That's what --

9 MS. TRAN: The refueling seal is not.

10 MR. ASHAR: Refueling seal.

11 MS. TRAN: So they have to put that in the  
12 scope of license renewal.

13 MR. ASHAR: This is what we are --

14 MEMBER APOSTOLAKIS: Okay.

15 CHAIRMAN WALLIS: Why don't they just  
16 require that they check the bellows for cracks  
17 routinely?

18 MR. ASHAR: It is not very easy to get to  
19 it. They can do tests. That's what they do most --

20 MEMBER SIEBER: It not the only place it  
21 can leak.

22 MR. ASHAR: Yes. And I say --

23 MEMBER SIEBER: They can leak along the  
24 edge.

25 MR. ASHAR: Yes. And this is what we want

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1 to have them in the scope of license renewal, so they  
2 maintain them in a condition where it is not leaking.

3 MEMBER MAYNARD: Well, by "suspected"  
4 here, don't you really mean if there has been some  
5 previous evidence that moisture has been there? You  
6 know, I suspect. I have a hard time dealing with what  
7 I might suspect, but I can deal with whether I have  
8 had any indications or evidence.

9 MS. TRAN: Yes. This is "suspect" or  
10 "detected" through your drain lines.

11 CHAIRMAN WALLIS: Well, if moisture is  
12 detected, now, that makes sense.

13 MEMBER MAYNARD: Yes.

14 MS. TRAN: It should be "detected,"  
15 instead of "suspected."

16 VICE CHAIRMAN SHACK: So if moisture has  
17 been detected any time in the life of this plant up  
18 until license renewal included? Is that what it says?

19 MEMBER APOSTOLAKIS: It is not really  
20 detected. Go ahead. You answered my question.

21 CHAIRMAN WALLIS: Well, just take out the  
22 "if" clause and say, "include."

23 VICE CHAIRMAN SHACK: Yes. Why not just  
24 include them?

25 MEMBER APOSTOLAKIS: I think "suspected"

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1 is broader because would that include a situation  
2 where you have seen moisture or water in a similar  
3 facility and you suspect it may happen in yours, even  
4 though you hadn't seen it? "Suspected" is broader.

5 MEMBER MAYNARD: Well, yes, but I think  
6 from a regulatory standpoint and from dealing with  
7 licensees, I think you need a little bit better  
8 definition rather than it just being somebody's  
9 opinion sitting there saying, "Well, I suspect there  
10 might be something there."

11 CHAIRMAN WALLIS: Suspected by whom?  
12 Inspector or is it --

13 MEMBER MAYNARD: Well, I like the  
14 "detected" or --

15 MS. TRAN: Detected. I think --

16 MEMBER BONACA: We had a discussion  
17 yesterday at Monticello that shows how difficult the  
18 issue is. I mean, we rely very much on subjective  
19 judgments and say, "Well, we don't think we ever had  
20 water."

21 CHAIRMAN WALLIS: You could simply say  
22 that "The ACRS suspects that there may always be water  
23 there. Therefore."

24 MEMBER APOSTOLAKIS: You guys must have  
25 had a hell of a meeting yesterday.

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1 VICE CHAIRMAN SHACK: In Monticello's  
2 case, they see no evidence of corrosion in '87, which  
3 was a fairly substantial operating period for them.

4 MEMBER APOSTOLAKIS: That's right.

5 MS. TRAN: Identified.

6 MEMBER ARMIJO: If they have good records,  
7 they have a good sound --

8 VICE CHAIRMAN SHACK: One data point.

9 MR. ASHAR: We have to draw things --

10 MEMBER ARMIJO: They don't have to do it.

11 MS. TRAN: So just to get back on --

12 CHAIRMAN WALLIS: You really fixed this  
13 up.

14 VICE CHAIRMAN SHACK: Why not just put  
15 these seals in scope and be done with it?

16 MR. ASHAR: This is what we tried to do  
17 earlier. And there is so much resistance from a  
18 number of applicants. I mean, I had to go to three or  
19 four RAIs over and above a lot of teleconferences to  
20 convince them to put this in the scope of license  
21 renewal. And so many people denied.

22 CHAIRMAN WALLIS: So now you have to  
23 convince them to suspect something?

24 MR. ASHAR: No. Now, with this ISG, if  
25 they have suspected sites, areas, then --

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1 CHAIRMAN WALLIS: But they don't want to  
2 do it anyway. They'll never suspect anything.

3 MEMBER APOSTOLAKIS: No. Presumably there  
4 will be some guidance what suspicion means.

5 MR. ASHAR: There is a guidance.

6 MEMBER APOSTOLAKIS: Yes.

7 MR. ASHAR: There is.

8 CHAIRMAN WALLIS: There must be.

9 MEMBER APOSTOLAKIS: It just doesn't say  
10 it in bullets.

11 MS. TRAN: Yes.

12 MR. ASHAR: I was looking for IWE-1240  
13 here. I don't have one.

14 CHAIRMAN WALLIS: Okay.

15 MR. ASHAR: But that is where it is fully  
16 described as to -- this is what we are invoking here  
17 basically.

18 CHAIRMAN WALLIS: You want to say  
19 something, "if there are indications of moisture" or  
20 something like that.

21 MR. KUO: If I may, Part 54 rule in the  
22 rule language in the SOC discussed this, saying if a  
23 component is in an environment that could have aging  
24 effect, say in the operating experience, anywhere in  
25 the industry or your specific plant, that there is

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1 such a degradation mechanism, degradation mechanism  
2 that could cause an aging effect, then an aging  
3 management program should be provided. That's what  
4 the Part 54 rule requires.

5 In other words, if this is a possible  
6 aging effect from the operating experience, then that  
7 is suspected. You would use the word "suspect." That  
8 happened before. We should not talk about the  
9 hypothetical aging effect, but it is an aging effect  
10 that we have seen before.

11 VICE CHAIRMAN SHACK: Right. That is why  
12 I can't understand why you can't just put the seals in  
13 scope. I mean, it's not a hypothetical event.

14 MR. KUO: Like Hans said, some people  
15 don't want to include the seal in the scope.

16 CHAIRMAN WALLIS: There are often people  
17 who don't want to do things, but you can say, "Do it."

18 MEMBER BONACA: What you want and what you  
19 get are two different things.

20 MR. GILLESPIE: I think you will find as  
21 a result of this ISG, fundamentally seals are in  
22 scope. Remember, seals and the refueling stuff are  
23 not safety basically. And so what we're doing is  
24 because of the effect of non-safety components on a  
25 safety component, we're bringing them into scope. So

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1 it's a bit indirect.

2 And so it shouldn't be a surprise that  
3 utilities don't want extra requirement on things that  
4 don't have any requirements on them now.

5 MEMBER BONACA: But, you know, one thing  
6 that we are learning from this license renewal process  
7 as we converge, it seems to me that the central issues  
8 are becoming the inaccessible or buried components  
9 that you can't look at, that you cannot measure. And  
10 that's natural because, I mean, these plants are going  
11 beyond some original design in certain components of  
12 the -- and I think that it is important that we focus  
13 on these inaccessible components and ask our  
14 questions, you know, how long can this live and what  
15 is the source of the problem. And here -- anyway --

16 MS. TRAN: Hans wanted me to read the  
17 IWE-1241, the examination surfaces, "Surface area for  
18 the typical location," "Typical location of such areas  
19 of those exposed to stand-in water, repeated wetting  
20 and drying, persistent leakage, and those with  
21 geometries that permit water accumulations,  
22 condensation, and biologicals attack." I mean, it is  
23 in the -- it tells the applicant the area.

24 Now, let's say if moisture is detected as  
25 suspected or identified --

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1 (Laughter.)

2 MS. TRAN: Now, we will agree that they  
3 found water. Okay? So they should include the  
4 component, the source of it, in the scope of license  
5 renewal. In addition, we need to identify the surface  
6 area.

7 Next slide. By implementing and  
8 augmenting inspection for the period of extended  
9 operation in accordance with the ASME section 11,  
10 subsection IWE and also for the examination shall be  
11 in accordance with section 11, subsection IWE-2500.  
12 And I did go over that a little bit earlier.

13 That means that surface area accessible  
14 from both sides should be visually examined and  
15 surface area that is only accessible from one side  
16 should be examined for wall thinning and using sonic  
17 thickness measurement method.

18 Now, after all of that, after all of the  
19 augmented inspection, the applicant should demonstrate  
20 that either corrosion is not occurring by performing  
21 those examinations or analysis to do analysis on the  
22 result or that corrosion is progressing so slowly that  
23 the age-related degradation will not jeopardize the  
24 intended function of the drywell to the period of  
25 extended operation.

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1 VICE CHAIRMAN SHACK: Just how thick is  
2 this light bulb again?

3 MR. ASHAR: The light bulb? It varies.  
4 From the top, it is thinner, very thin, right around  
5 half-inch to three-quarter-inch. As you go down near  
6 the knuckle area between the sphere and the upper  
7 part, it is spherical area. It is close to about .7,  
8 .6 inches. Then it again goes down up to six inches.  
9 And then at the bottom area is about one to one and a  
10 half inches in between the sand pocket area --

11 VICE CHAIRMAN SHACK: No. But, I mean,  
12 it's 17 ml a year.

13 MR. ASHAR: Oh, yes.

14 VICE CHAIRMAN SHACK: You're going to chew  
15 that at a pretty good clip.

16 MEMBER BONACA: If you find a hole in the  
17 liner, I mean, would you suspect some moisture there?  
18 I mean, what is --

19 CHAIRMAN WALLIS: Even my chassis of my  
20 car, which is soaked in salt, doesn't corrode at 17 ml  
21 per year, does it? It's really bad conditions if  
22 you've got --

23 MR. GILLESPIE: Yes. That actually is the  
24 two worst points that a particular --

25 CHAIRMAN WALLIS: Yes, very bad --

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1 MR. GILLESPIE: -- that they reported to  
2 us. What it does do, though, is say there is  
3 operating history out there in this utility  
4 environment, that we cannot take for granted that it  
5 can't happen.

6 CHAIRMAN WALLIS: Right.

7 MR. GILLESPIE: And that's the reason for  
8 the ISG. We are not going to make the assumption  
9 because we have operating history that says it's not  
10 necessarily a valid assumption in all cases that it's  
11 going to go slow. There has been evidence of this  
12 going faster than people would have originally  
13 anticipated in the designs.

14 MEMBER BONACA: But in some cases where we  
15 have questioned the bellows, particularly the seals,  
16 if you're in seals, then the answer is always, well,  
17 we have good drainage. So you are in a quandary. I  
18 mean, what leads you --

19 MR. ASHAR: There are a number of things  
20 that tells us. The first thing, the drains are not  
21 clogged any time in the past. The second thing,  
22 visual examinations performed in the areas, it was  
23 shown there are no telltale signs of water for a  
24 number of inspections there performed. Then they had  
25 to show us at the bottom in the drain line there was

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1 no water coming out anywhere.

2 So there are so many things that they  
3 would tell us before they convince us that there is  
4 nothing going on.

5 MR. GILLESPIE: Mario, I would also say  
6 that I think this came up in Monticello's case  
7 yesterday, --

8 MR. ASHAR: Right.

9 MR. GILLESPIE: -- where they didn't take  
10 credit for it, but they actually had a primer sprayed  
11 on the outside of the inaccessible area. And other  
12 licensees have different applications of codings on it  
13 also.

14 And so it's not one thing.

15 MEMBER BONACA: Yes, I know, but --

16 MR. GILLESPIE: Aging management is  
17 accumulation of codings, time of exposure, amount of  
18 water.

19 MEMBER BONACA: And the spray on the  
20 surface was 65 or 40 years ago practically, 1965. So,  
21 you know, right. I understand.

22 MR. GILLESPIE: But the environment is not  
23 such that there is anything in there to actually cause  
24 the paint to peel off either. So there's no one issue  
25 here.

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1 MEMBER BONACA: Yes. I understand.

2 MR. GILLESPIE: It's different pieces to  
3 try to give you reasonable assurance.

4 MEMBER BONACA: In fact, yesterday at the  
5 end of the conversation, it was the lady who was  
6 performing the inspections felt confident with that.  
7 I'm sure that if you go physically and look at it and  
8 get information, you know, you can build a credible  
9 case that there is no concern with moisture. So I  
10 accepted that yesterday.

11 MEMBER ARMIJO: But a case has to be made  
12 --

13 MEMBER BONACA: Yes, it does.

14 MEMBER ARMIJO: -- with documented data,  
15 not just --

16 MEMBER BONACA: Right.

17 MEMBER MAYNARD: Is there something that  
18 is done periodically to ensure that these drains are  
19 really open, like particularly the sand point drains  
20 and stuff, that they're not plugged in some way?

21 MR. ASHAR: Now they are committing to  
22 those things. They have ensured those things, yes.

23 VICE CHAIRMAN SHACK: You'll find out when  
24 you have a leak.

25 MEMBER SIEBER: A sand pocket drain is a

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1 four-inch pipe. So they're hard to plug.

2 VICE CHAIRMAN SHACK: Yes.

3 MEMBER BONACA: I believe we have also  
4 some comments from the industry.

5 MS. TRAN: Right. Yes.

6 MEMBER BONACA: So shortly we'll get to  
7 those.

8 MS. TRAN: I am almost done. Now, if the  
9 intended function of the drywell cannot be met, the  
10 applicant can identify actions that will be taken as  
11 part of the aging management program to ensure that  
12 the integrity of the drywell would be maintained  
13 through the period of extended operation.

14 Last slide. Now, the drywell shell  
15 concern has already been addressed for the reactor's  
16 initial 40 years' licenses and relevant plants that  
17 have received a renewal license, as indicated in the  
18 left column there.

19 Now, the staff is in the process of  
20 reviewing the plants in the middle column. And the  
21 third column represented the remainder of the plants  
22 with the Mark I steel containment design.

23 Not all the plants in the third column,  
24 however, have announced their intention to renew their  
25 license, but the future review that's listed on the

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1 right side.

2 This concludes my presentation. So we can  
3 entertain any additional questions that you might  
4 have.

5 MEMBER BONACA: You don't have to request  
6 questions.

7 CHAIRMAN WALLIS: Ell, I suspect there  
8 might be some more questions.

9 (Laughter.)

10 MEMBER SIEBER: I don't know what they  
11 would be that we haven't already asked.

12 MEMBER BONACA: Any additional questions?

13 (No response.)

14 MEMBER BONACA: None. So we thank you for  
15 a very good presentation.

16 MS. TRAN: Thank you.

17 CHAIRMAN WALLIS: You have been here all  
18 day, Alex.

19 MR. MARRION: I know. Can I get one of  
20 those little name tag things? I'll just put it on.

21 (Laughter.)

22 MR. MARRION: Good afternoon. My name is  
23 Alex Marrion. I'm Senior Director of Engineering with  
24 NEI. And with me I have James Ross, who is the senior  
25 project manager with lead responsibility for license

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1 renewal. He's here to keep me out of trouble. He  
2 should have been here earlier.

3 I just want to make a couple of general  
4 comments. Based upon comments that the NRC made about  
5 the uniqueness of the specific plant designs, we feel  
6 that this is not really a generic issue, but it's  
7 appropriate to address it on a plant-specific basis in  
8 accordance with the uniqueness of the designs. And I  
9 think Frank Gillespie brought that up.

10 This is not a new issue. It's been  
11 addressed by the licensees in the past. There was a  
12 generic letter, 8705. And inspection requirements  
13 were incorporated into NRC regulations when NRC  
14 endorsed the ASME code subsection IWE as part of an  
15 update of 10 CFR 50.55(a).

16 Because that was already regulatory  
17 requirements, utilities were resisting the idea of  
18 imposing an additional regulatory requirement given  
19 that there wasn't sufficient evidence to indicate that  
20 the current requirement was not adequate if that makes  
21 sense.

22 The particular interim staff guidance is  
23 out for comment. Right now comments are due the 8th  
24 of June. We intend to submit comments on behalf of  
25 the industry.

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1           Most of the comments will be of a  
2 clarifying nature to make sure we understand the  
3 language, et cetera, which brings me to a more generic  
4 communication process issue. You know how I feel  
5 about generic communications based upon comments I  
6 made earlier.

7           The one thing that is not clear to us as  
8 an industry is why there is a need for an ISG process  
9 to begin with given that the NRC already has a  
10 well-established generic communication process that  
11 could be used as a vehicle for communicating staff  
12 guidance going forward.

13           So now we have generic communications.  
14 And we also have interim staff guidance, two separate  
15 processes that basically overlap. So we're going to  
16 continue making that point with every opportunity we  
17 have.

18           Lastly, I understand some question has  
19 been raised about the idea of continuing or the idea  
20 of imposing ultrasonic testing requirements. I want  
21 to make it clear that the current requirements that we  
22 currently have are for a graded approach to a visual  
23 examination.

24           And depending upon what you find, you do  
25 a more comprehensive examination, but the first step

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1 is a visual. And that's basic --

2 CHAIRMAN WALLIS: How do you visually  
3 inspect these inaccessible areas?

4 MR. MARRION: Well, as you heard from the  
5 staff, you do an examination of the inaccessible areas  
6 based upon what you find of the accessible areas if I  
7 have characterized it properly in what the staff was  
8 proposing.

9 And for the Mark I's, we intend to  
10 continue that process going forward. And we will be  
11 commenting accordingly on the ISG comments.

12 CHAIRMAN WALLIS: You have to be able to  
13 access some place which is relatively typical of the  
14 inaccessible places in order to do that.

15 MR. MARRION: Yes. I'm not familiar with  
16 the details of what that is, yes.

17 That's all I have, sir.

18 MEMBER ARMIJO: I just think that is  
19 fundamentally unsound because you have, really, a  
20 crevice condition in that sand pocket area. It's not  
21 at all represented by the accessible area.

22 And so looking at a safe location to make  
23 a judgment of a susceptible location seems to me a  
24 waste of time. I mean, if the accessible area is  
25 highly corroded, you can be sure that the inaccessible

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1 is in bad shape.

2 MR. MARRION: Right.

3 MEMBER ARMIJO: But the converse isn't  
4 true.

5 MEMBER APOSTOLAKIS: But didn't Jack say  
6 that for the water to get to the inaccessible area, it  
7 has to go through the accessible areas?

8 MEMBER ARMIJO: Yes, but it doesn't stay  
9 there.

10 VICE CHAIRMAN SHACK: It doesn't stay  
11 there.

12 MEMBER ARMIJO: It flows.

13 VICE CHAIRMAN SHACK: You have got a drain  
14 right at that thing. I mean, there is no way for  
15 water to really accumulate --

16 MEMBER APOSTOLAKIS: It is not  
17 accumulating.

18 VICE CHAIRMAN SHACK: -- in that  
19 accessible area.

20 CHAIRMAN WALLIS: But it gets to the sound  
21 --

22 MEMBER APOSTOLAKIS: But you are going to  
23 see some moisture or something.

24 MEMBER ARMIJO: You can make a case that  
25 if it's always been dry, that's your best case. You

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1 have good data.

2 MEMBER MAYNARD: I thought part of that,  
3 it would depend on what you include as a visual area  
4 for what you base -- if you're including the drains  
5 and if there is any moisture coming out of the sand  
6 drains or anything like that, well, that might be  
7 appropriate. But if you're saying that all you have  
8 to do is just visually look at the inside of the  
9 container there, that you don't have to do anything  
10 else.

11 But if you include as part of what you  
12 find visually results of drains and other things --

13 MR. MARRION: That is a comprehensive  
14 examination requirement that's in 50.55(a) right now.

15 Thank you. And I appreciate the time I  
16 spent with this illustrious body today.

17 (Laughter.)

18 MEMBER KRESS: We are honored to have you.

19 MEMBER BONACA: If there are no further  
20 questions, first of all, I want to thank the staff for  
21 their presentations and for the information. And then  
22 I'll turn the meeting back to you, Chairman.

23 CHAIRMAN WALLIS: Thank you very much.

24 We are finished with our formal  
25 presentations for the day.

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1 MEMBER KRESS: We don't have a letter on  
2 this particular issue?

3 MEMBER BONACA: No.

4 MEMBER KRESS: This was just a briefing?

5 CHAIRMAN WALLIS: Just a briefing. It was  
6 just a briefing.

7 MEMBER BONACA: There is no impact  
8 because, I mean, it was helpful because, again,  
9 yesterday we had a --

10 CHAIRMAN WALLIS: We don't need that --

11 MEMBER KRESS: Are we going to give some  
12 feedback now or anything on what we've heard or do you  
13 think the questions are sufficient?

14 VICE CHAIRMAN SHACK: The questions were  
15 sufficient.

16 CHAIRMAN WALLIS: Unless you have another  
17 point you want to make. Do you want to make some  
18 point?

19 MEMBER KRESS: Well, my point was that I  
20 just don't like this round-about way of doing things  
21 in the sense that I think there's a fatal flaw in  
22 trying to use the accessible areas to determine  
23 whether or not there is a problem in the inaccessible  
24 areas.

25 I would do what Bill Shack just said. Why

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1 not just include those sources of moisture within the  
2 scope?

3 VICE CHAIRMAN SHACK: Well, I think --

4 MEMBER KRESS: I know it has been resisted  
5 by the industry, but it doesn't seem like that big of  
6 a burden to me. I think that's the real solution.  
7 And that's what they're after, but they're trying to  
8 do it in a round-about way.

9 VICE CHAIRMAN SHACK: I also think a  
10 techie could come up with a way to measure those  
11 thicknesses.

12 MEMBER KRESS: Show me that way, and that  
13 may be okay. That's possible.

14 MEMBER SIEBER: Well, when you put the  
15 refueling seal in the scope, all you're doing is  
16 establishing an aging management program for that.  
17 That doesn't prevent leakage necessarily because there  
18 may be something other than the aging that causes the  
19 leaking.

20 MEMBER KRESS: Okay. Maybe. Maybe I am  
21 flawed.

22 MEMBER SIEBER: You could twist it, and  
23 now it leaks.

24 CHAIRMAN WALLIS: You should probably  
25 inspect a more susceptible area, which is a sand

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1 pocket.

2 MEMBER SIEBER: I think you have to deal  
3 with the --

4 MEMBER BONACA: In the past we left it to  
5 the --

6 MEMBER SIEBER: -- rather than deal with  
7 something that is removed from it.

8 MEMBER BONACA: In the past we left it to  
9 a licensee to have a choice. For example, in Browns  
10 Ferry, the staff was asking for inspection of the  
11 seals. They fought that. We left them open, either  
12 that or UT the liner in the vulnerable locations. And  
13 they chose to UT the liners.

14 The burden is inaccessibility because  
15 there is going to be that every ten years. And when  
16 they do the ISR, they are in containment. And they  
17 physically can then perform most of the utilities in  
18 those locations. So we left open those possibilities.

19 I take your point, and I think the  
20 Committee should decide. Should we have a comment on  
21 this or -- the intent wasn't one of providing a  
22 letter. This was an informational presentation, but  
23 --

24 CHAIRMAN WALLIS: I think the staff has  
25 heard our comments. It was a preliminary sort of

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1 thing. And that is probably good enough for now.

2 MR. GILLESPIE: We appreciate the comments  
3 because, as Mario said, underground cabling, piping,  
4 and this kind of large passive component are really  
5 becoming kind of the end point. Everything else we  
6 know how to deal with for the most part.

7 But I will say in this case -- and let me  
8 take Browns Ferry. You might say, well, why did  
9 Browns Ferry choose UT versus the seals. Browns Ferry  
10 actually had unidentified sources of leakage. And he  
11 said versus trying to identify every source of leakage  
12 because they didn't know where it was that their  
13 cheapest way out was actually to do the UT.

14 But they got the idea that we wanted to  
15 wait. And you had to assure us this thing was going  
16 to be okay relative to thickness.

17 VICE CHAIRMAN SHACK: That sand pocket is  
18 pretty big. I mean, you can have a fair amount of  
19 moisture in there that you're never going to see  
20 coming out of those drains. And, yet, you could have  
21 attack over a reasonable fraction of that.

22 MEMBER SIEBER: There are oodles of  
23 surface in there for the moisture to collect on.

24 MR. GILLESPIE: But, again, the locations  
25 of the drains are plant-specific. Some plants have

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1 seals, as Monticello had over it. Some places have a  
2 liner or coding on the other side of the surface.

3 VICE CHAIRMAN SHACK: Well, a bottom drain  
4 would give me a whole lot more comfort than that top  
5 drain would.

6 MR. GILLESPIE: Yes. The other thing is  
7 the sand is very compacted.

8 MEMBER KRESS: Have you ever tried to  
9 drain moisture out of the sand from the bottom? It  
10 doesn't come out.

11 MR. GILLESPIE: I don't want to pooh-pooh  
12 it, but the idea that this is a 130-degree area also  
13 --

14 VICE CHAIRMAN SHACK: You drive it out  
15 with --

16 MR. GILLESPIE: And so you're going to  
17 drive it out. And so you've actually got the occasion  
18 to get water in there about 20 days every 18 months or  
19 24 months depending on the fuel cycle someone is on  
20 and how long it's flooded. And that's why we've  
21 started to key into visual. You might say, visual  
22 leakage from someplace kicks you into needing to do a  
23 UT.

24 Now, what this inter-staff guidance  
25 position does do is says the identification of

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1 moisture, basically leakage, is equivalent to the  
2 visual recognition of accelerated corrosion on the  
3 inside. And that's an important distinction, which  
4 never existed before.

5 So for the inaccessible areas, we're using  
6 the indirect indication of seeing water as kind of an  
7 assumption that you have to do the same thing as if  
8 you saw accelerated corrosion on the inside. That  
9 gets us a measurement on an event basis.

10 And so someone who is sworn to keeping  
11 this thing dry, if they have an event during a  
12 refueling where they get leakage in there, now they're  
13 obligated to do something which is a bit more onerous  
14 and reestablish their rate.

15 It's not perfect. By the way, there are  
16 two inaccessible areas. We should be clear on that.  
17 There is the inaccessible area in the air gap. And  
18 then there's this inaccessible area that's layered on  
19 the bottom between the two concrete layers, which is  
20 really probably the most difficult area, but it was  
21 designed to last 40 years. It is totally lined with  
22 concrete. And then you've got this temperature  
23 gradient.

24 CHAIRMAN WALLIS: Is 40 years good enough  
25 with license renewal, though?

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1 MR. GILLESPIE: Now, it was originally  
2 designed for 40 years, but that was kind of an  
3 assignment. But now if you have no evidence of in  
4 leakage or water in there, I mean, again, it's  
5 indirect stuff. It's almost like a circumstantial  
6 case we're acting --

7 CHAIRMAN WALLIS: Concrete is not dry all  
8 the time.

9 MR. GILLESPIE: Concrete is porous  
10 material, and it is not dry all the time. And so then  
11 you could ask questions. A fair question in the aging  
12 management program is, what are you doing about  
13 groundwater? And do we have any evidence of  
14 groundwater?

15 We asked that from Nine Mile. And I think  
16 we're coming. I signed up the draft SE this morning.  
17 So I think next month we're probably coming on Nine  
18 Mile. They have actually got alarms on their drains  
19 if moisture is detected.

20 So every plant is doing some unique  
21 things.

22 CHAIRMAN WALLIS: Moisture can come out of  
23 the concrete. There is a lot of concrete. There is  
24 a late curing of the concrete which goes on for a long  
25 time. Then it can be damp. It doesn't have to be

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1 very damp --

2 MR. GILLESPIE: Right.

3 CHAIRMAN WALLIS: -- to produce some  
4 chemical reaction.

5 MR. GILLESPIE: What is the impact? This  
6 is what I don't know, is what is the impact of this  
7 temperature gradient.

8 CHAIRMAN WALLIS: You don't have oxygen.  
9 So that is probably what protects you.

10 MR. GILLESPIE: And so there is a number  
11 of things that -- we're doing our best, appreciate the  
12 Committee's comments, and more than happy. If anyone  
13 else has any better ideas, we would love to have them,  
14 but this ISG was an effort to send a benchmark for  
15 basically the best-performing plant on liners.

16 It has no moisture. What if you get  
17 moisture? How do you establish your rate? This is  
18 kind of putting out, in essence, that they now know we  
19 do expect a rate to even be established. We didn't  
20 have that in writing before.

21 CHAIRMAN WALLIS: We won't comment on it,  
22 and we hope it works out.

23 MR. GILLESPIE: Well, feel free to comment  
24 on it. We're happy to have comments. NEI is going to  
25 feel free to comment on it.

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1 CHAIRMAN WALLIS: We won't.

2 MEMBER BONACA: Certainly we will comment  
3 on individual applications.

4 MR. GILLESPIE: Yes. I do think this is  
5 middle ground we are wrestling with here because I do  
6 agree with Alex that the individual designs that we're  
7 applying this concept to are significantly different.  
8 In critical questions, like locations of drains, some  
9 are going to be more susceptible than others.

10 As I said, Browns Ferry said we have  
11 unidentified leakage. We know we have leakage. It's  
12 not a lot. UT is our answer. It's the only way that  
13 could give us positive confirmation.

14 CHAIRMAN WALLIS: Have they been having  
15 leakage on their reactor which has been shut down for  
16 all that period of time, unidentified leakage?

17 MR. GILLESPIE: Well, remember, we license  
18 units I, II, and III. The floor wasn't flooded on 1.  
19 So they haven't had any leakage on I for a long time.

20 CHAIRMAN WALLIS: They think they haven't.  
21 They could have an unidentified leakage.

22 MR. GILLESPIE: They had some unidentified  
23 leakage from refuelings in the other units, and they  
24 chose UT.

25 MEMBER SIEBER: They have them for fuel

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1 for --

2 MR. GILLESPIE: By the way, this is a very  
3 high-dose area, too. And so the question here isn't  
4 money.

5 MEMBER BONACA: Not only they. I mean --

6 MR. GILLESPIE: It's going to be dose.

7 MEMBER BONACA: Where the seals are, it's  
8 a very high red area.

9 MR. GILLESPIE: Yes.

10 MEMBER BONACA: Not down in the sand  
11 pocket.

12 MR. GILLESPIE: It depends on where you're  
13 at. You're directly under the vessel.

14 CHAIRMAN WALLIS: No one is going to go  
15 down there.

16 MR. GILLESPIE: My understanding from the  
17 licensees is from a radiological perspective, this is  
18 not an area you want to take lightly doing extra  
19 measurements over and above what you really need to  
20 confirm your --

21 CHAIRMAN WALLIS: BSBWR has hatches that  
22 you go in into the reactor pedestal area.

23 MEMBER BONACA: We were told by TVA that  
24 it is not a high red area because it is well below the  
25 --

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1                   MEMBER KRESS: Graham, I was wondering if  
2 the staff is considering a user need letter to  
3 Research to try to develop a way to do this more  
4 definitively, maybe strong on ultrasonics or  
5 something. Is there such a user need letter or any --

6                   VICE CHAIRMAN SHACK: Well, there is  
7 something from Oak Ridge now.

8                   MR. GILLESPIE: Actually, there is a  
9 letter report that just recently got put in ADAM from  
10 Oak Ridge, from a project that Research sponsored, but  
11 it is not commercially available yet. And, as best I  
12 understand it, it is a technique to calibrate for this  
13 concrete steel concrete sandwich.

14                   I think, as I understand it, there are  
15 three different alternative approaches to doing it.  
16 And so the information is starting to be developed and  
17 published. But we're probably years away from actual  
18 commercial application to go from the research bench  
19 to the --

20                   MEMBER KRESS: Yes, but you have got years  
21 to go to do it in. I mean, the corrosion rate is low  
22 enough that --

23                   MR. GILLESPIE: I am not disagreeing. If  
24 the Committee would like to -- we think we're actually  
25 pretty close right now on a plant-by-plant basis. But

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1 if the Committee would like to write a letter  
2 recommending a research project, it's okay. I don't  
3 mind. It's your Committee.

4 MEMBER SIEBER: The question is what do  
5 you want to cut out to pay for it.

6 MEMBER MAYNARD: I would like to just add  
7 on to Tom's previous comment just a little bit. It  
8 doesn't surprise me. And I would expect the industry  
9 to resist new requirements, new changes to things. I  
10 think it better to get the fight over, have it once,  
11 rather than a lot of times.

12 So, rather than dealing with a lot of  
13 things through staff guidance, generic letters, a lot  
14 of times it would be better if this is going to be a  
15 new expectation, new requirement, let's follow the  
16 process and make that -- you know, get the fight over  
17 with once, make it happen, rather than continually  
18 trying to go around these systems just generically.

19 MEMBER SIEBER: The requirement has always  
20 been there. And it stems from the code requirement.  
21 The question is, what do you do and how do you do it  
22 to give yourself a reasonable assurance that you're  
23 okay.

24 MR. GILLESPIE: The new aspect now is  
25 people having to articulate in an aging management

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1 program what they're going to do to ensure that their  
2 monitoring and measurement process for this liner will  
3 detect its approach to minimum wall thickness prior to  
4 it getting there.

5 I mean, that's really what plant license  
6 renewal is, to ensure that you have the additional  
7 monitoring programs in place that you will detect and  
8 correct prior to exceeding that minimum wall  
9 thickness.

10 The discussion of this ISG between us and  
11 the industry is evoked. I think it has now gotten us  
12 to a point where we have some actual cases under our  
13 belt that have now, you might say, set the standard  
14 for the next ones to come in.

15 And now we've got each plant evaluating  
16 itself against the plants we have already looked at  
17 and saying, "Am I like them? Am I different? If I'm  
18 different, then is it a positive difference or  
19 negative difference?"

20 And now we're starting to get those kind  
21 of aging management considerations into this piece of  
22 equipment, which we did not have, quite honestly,  
23 going in until we hit Browns Ferry.

24 The Committee wants -- Mario will remember  
25 this. I forget which BWR they were in. It was on the

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1 steam dryers. And I used the Committee. I quoted the  
2 Committee to the staff on the liner. And it was on  
3 the dryers.

4 And, Mario, I forget. You might have been  
5 the one who said it. You said it's large, it's  
6 passive, and you just wrote a generic letter saying  
7 it's safety. It wasn't in scope before that statement  
8 was made. It's now in scope. And, you know, the  
9 staff said it's large, it's passive, it has corrosion,  
10 and it's safety. And so now we're trying to take it  
11 on head on. I think with some success, you're seeing  
12 the applications getting it addressed at some level of  
13 credibility now.

14 MR. THADANI: Graham, I have one quick  
15 question.

16 Frank, you noted this is a high-dose area.  
17 This issue is one important in many ways, has I think  
18 rather minimal risk to public. How is that sort of  
19 balanced in terms of the actions called for and its  
20 relative importance?

21 MR. GILLESPIE: I think how we are trying  
22 to deal with that -- and we have got a meeting with  
23 one applicant day after tomorrow, Oyster Creek, on  
24 this, on our residual concerns after their RAIs. And,  
25 really, what we started talking about was the

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1       uncertainties involved in the decision.

2                   And so the question really is, how much  
3       should you pay for certainty in a decision? Because  
4       the significant measurement uncertainty and doing  
5       these UT exams, they're actually fairly coarse.

6                   There is uncertainty in primers and  
7       liners, which have exceeded, basically, the  
8       manufacturer-recommended lives of 10 to 15 years.  
9       Yet, they're still there. And they're still being  
10      inspected doing what they're doing.

11                  There is uncertainty in have you picked  
12      enough selected locations because we are looking for  
13      a general area degradation. We're not looking for  
14      just pitting.

15                  The Committee didn't mention it, but there  
16      are really two concerns. One is pressure retention  
17      and accident. And the other is buckling, the sheer  
18      collapsing of this thing under its own weight. And so  
19      you've got two reasons to inspect two different areas.

20                  And so I would suggest that in this ISG  
21      and what we're seeing from these utilities, we're  
22      actually accepting, you might say, a fair level of  
23      uncertainty in it to keep it rational.

24                  And so the safety consideration is in how  
25      much do we want to press people to make it more and

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1 more certain. And so that's really how we're  
2 factoring in the safety significance of it.

3 When I talk about dose and how many  
4 measurements need to be taken, we need reasonable  
5 assurance. And in many cases, there's not positive  
6 evidence on either side because this is a large  
7 passive thing that was put in there. It's expected to  
8 last forever fundamentally from the designer's point  
9 of view. We're confirming that assertion.

10 CHAIRMAN WALLIS: It probably will in most  
11 plants last.

12 MR. GILLESPIE: In most plants, I think it  
13 will. And so it's a confirmation. And so we're not  
14 designing the plant, which is very vigorous. We're  
15 confirming that the expected performance will be  
16 sustained. And we probably can be slightly less  
17 rigorous in the uncertainty we accept on that.

18 CHAIRMAN WALLIS: That is all the agency  
19 ever does. It doesn't design plants.

20 MR. GILLESPIE: Right.

21 CHAIRMAN WALLIS: It confirms performance.

22 MR. GILLESPIE: But you learn how much,  
23 what you're going to do in that confirmation.

24 MEMBER BONACA: Yes.

25 CHAIRMAN WALLIS: I think we may have gone

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1 over. We have gone over 15 minutes. I think it's  
2 about time we --

3 MEMBER BONACA: One last comment I had was  
4 that, you know, so many of the -- however the  
5 inspection processes we still depend on, for example,  
6 the visual inspection of this, we are still at the  
7 pace that really was conceived at the moment these  
8 plants are put in renewal. Okay? So every ten years  
9 they go in and look at it. Okay?

10 To me, you know, as these plants get older  
11 and older, these inaccessible areas, et cetera, you  
12 know, then maybe the frequency with which we're  
13 looking at it becomes more questionable because, you  
14 know, every ten years, a lot of things can happen.

15 CHAIRMAN WALLIS: Especially when you  
16 start to find things.

17 MR. GILLESPIE: We have occasions in  
18 several licensees where because they were sticking to  
19 a more extended inspection period, even when they had  
20 evidence of water, they did not consider evidence of  
21 water equivalent to accelerated corrosion visually.

22 So this ISG actually tries to take the  
23 principle you just espoused and says, "You can no  
24 longer in our expectation, staff's expectation, you  
25 can no longer ignore the presence of water. You have

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1 to now give us positive confirmation that the rate of  
2 degradation is still being minimized.

3 CHAIRMAN WALLIS: It is not boric acid.

4 MR. GILLESPIE: Yes, yes. At least we're  
5 dealing with a general moisture.

6 CHAIRMAN WALLIS: Right.

7 MR. GILLESPIE: And so this actually does  
8 go for that extended period to some incidents in which  
9 we actually have evidence from various licensees.  
10 They had evidence of water and basically did an  
11 engineering evaluation and did not obtain positive  
12 information if the thickness was okay.

13 MEMBER BONACA: What are you going to do  
14 when one of the already approved license renewals is  
15 going to come in for another license renewal?

16 MR. GILLESPIE: They have talked to us  
17 about that.

18 MEMBER BONACA: Well.

19 MR. GILLESPIE: I'm hoping to be retired  
20 by that point.

21 MEMBER BONACA: Anyway, I think we will  
22 see how this works.

23 MR. GILLESPIE: I started with the draft  
24 of the renewal rule in 1989 and have been doing this  
25 now for the last five years. At some point, someone

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1 else should do it.

2 MEMBER BONACA: All right.

3 MR. GILLESPIE: Thank you.

4 MEMBER BONACA: I give you back the  
5 meeting, Mr. Chairman.

6 CHAIRMAN WALLIS: We are ready to come off  
7 the record. Thank you very much for recording the  
8 meeting today, and we will take a break until a  
9 quarter to 5:00.

10 And when we come back, we will finish  
11 Mario's letter, which seems to be fairly  
12 straightforward. And then we will know where we are  
13 going with the other letter, hopefully know well  
14 enough that we can see our way to the end of it  
15 tomorrow.

16 (Whereupon, the foregoing matter was  
17 concluded at 4:34 p.m.)

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# Official Transcript of Proceedings

## NUCLEAR REGULATORY COMMISSION

Title: Advisory Committee on Reactor Safeguards  
533rd Meeting

Docket Number: (not applicable)

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Date: Wednesday, May 31, 2006

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS (ACRS)

533rd MEETING

+ + + + +

WEDNESDAY, MAY 31, 2006

+ + + + +

ROCKVILLE, MARYLAND

+ + + + +

The Subcommittee met in Room T2B1 at Two White Flint North, 11555 Rockville Pike, Rockville, Maryland, at 8:30 a.m., Graham B. Wallis, Subcommittee Chair, presiding.

MEMBERS PRESENT:

- GRAHAM B. WALLIS Chairman
- WILLIAM J. SHACK Vice Chairman
- GEORGE E. APOSTOLAKIS Member
- J. SAM ARMIJO Member
- MARIO V. BONACA Member
- RICHARD S. DENNING Member
- THOMAS S. KRESS Member
- OTTO L. MAYNARD Member
- JOHN D. SIEBER ACRS Member-At-Large
- JOHN LARKINS Designated Federal Official

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1       ACRS STAFF PRESENT:

2       HANS ASHAR                    NRR

3       DANIEL FRUMKIN                NRR

4       ALEX KLEIN                    NRR

5       THOMAS KOSHY                 EEEEB/DE/NRR

6       MICHAEL MAYFIELD             DE/NRR

7       GEORGE MORRIS                EEBE/DE/NRR

8       LINH TRANS                    NRR

9       GEORGE WILSON                NRR

10      ROBERT WOLFGANG             NRR

11      ROY WOODS                     RES

12

13      ALSO PRESENT:

14      HAROLD BARRETT               Duke Power Company

15      MIKE FALLON                  Constellation Energy

16      ALEX MARRION                 NEI

17      DAVID MISKIEWICZ            Progress Energy

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AGENDA ITEMS

PAGE

Opening Remarks, Chairman Graham B. Wallis . . . 4

Draft Final Generic Letter, "Post-Fire  
Safe-Shutdown Circuit Analysis  
Spurious Actuations" . . . . . 5

Draft Final Generic Letter 2006-XX,  
"Inaccessible or Underground Cable  
Failures that Disable Accident  
Mitigation Systems" . . . . . 149

Interim Staff Guidance on Aging Management  
Program for Inaccessible Areas of Boiling  
Water Reactor (BWR) Mark I Containment  
Drywall Shell . . . . . 195

Adjournment

## P R O C E E D I N G S

(8:31 a.m.)

CHAIRMAN WALLIS: The meeting will now come to order.

This is the first day of the 533rd meeting of the Advisory Committee on Reactor Safeguards. During today's meeting, the Committee will consider the following:

Draft Final Generic Letter, Post-Fire Safe-Shutdown Circuit Analysis Spurious Actuations, Draft Final General Letter, Inaccessible or Underground Cable Failures that Disable Accident Mitigation Systems, Interim Staff Guidance on Aging Management Program for Inaccessible Areas of Boiling Water Reactor Mark I Containment Drywell Shell, and Preparation of ACRS reports.

This meeting is being conducted in accordance with the provisions of the Federal Advisory Committee Act. Dr. John T. Larkins is the Designated Federal Official for the initial portion of the meeting.

We have received no written comments from members of the public regarding today's sessions. We have received a request from Alex Marrion, NEI, for time to make oral statements regarding the Generic

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1 Letter on Post-Fire Safe-Shutdown Circuit Analysis and  
2 the Generic Letter on Inaccessible or Underground  
3 Cable Failures that Disable Accident Mitigation  
4 Systems.

5 A transcript of portions of the meeting is  
6 being kept and it is requested that the speakers use  
7 one of the microphones, identify themselves, and speak  
8 with sufficient clarity and volume so that they can be  
9 readily heard.

10 I will begin with some items of current  
11 interest. In the items handed out to you, I notice  
12 that there is a speech by Commissioner Yatzko at the  
13 beginning. And at the end, there is an interesting  
14 article on various matters which complicate PWR sump  
15 evaluations.

16 Now in the middle of the day, we are going  
17 to have ethics training which is why the lunch break  
18 is so long today. And the ethics training is  
19 scheduled for between 12:15 and 1:30 so you should be  
20 here at 12:15 and ready to be trained in ethics.

21 That is the end of my prepared remarks.  
22 And I'd like to proceed with the meeting. Call on  
23 Rich Denning to get us started on the first item.

24 MEMBER DENNING: Thank you. We will be  
25 hearing from the staff regarding the draft final

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1 generic letter 2006-XX, Post-Fire Safety-Shutdown  
2 Circuit Analysis Spurious Actuations. The Committee  
3 will hear presentations by and hold discussion with  
4 representatives of the staff.

5 Additionally, Mr. Alex Marrion with NEI,  
6 has requested ten minutes to share NEI's perspective  
7 after the staff's presentation.

8 The Committee had requested to review the  
9 generic letter regarding Post-Fire Safe-Shutdown  
10 Circuit Analysis Spurious Actuations after the public  
11 comment period. We did not have a prior subcommittee  
12 meeting on this letter which may have been a mistake.

13 I have serious reservations about the  
14 balance between regulatory burden and approved safety  
15 associated with this letter. The letter leaves open  
16 options for risk informing this process but they are  
17 not easy activities to perform. So we are anxious to  
18 hear what the staff has to say on this. And to have  
19 a healthy discussion, I believe.

20 We have a considerable period of time  
21 actually to do this, three hours. But I think that we  
22 will want to look into this letter very carefully  
23 before giving our blessing.

24 I think we are now ready to hear from  
25 staff. And I'll turn it over to Alex Klein of the

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1 Office of Nuclear Reactor Regulation.

2 MR. KLEIN: Thank you very much. My name  
3 is Alex Klein. You see on the cover slide here my  
4 branch chief's name, Sunil Weekakkody. He extends his  
5 regrets for not being able to attend today's meeting  
6 in that he had a prior commitment for jury duty today.  
7 With that, I'm acting in his place so I will give the  
8 opening presentation.

9 The purpose of today's meeting and the  
10 presentation to the Committee is to present the final  
11 draft of Generic Letter 2006-XX, Post-Fire Safe-  
12 Shutdown Circuit Analysis Spurious Actuations. We are  
13 also here to obtain ACRS endorsement to issue the  
14 proposed generic letter.

15 I'd like to introduce the two primary  
16 staff members who will present today for NRR. To my  
17 left is Robert Wolfgang who is the primary author of  
18 the generic letter. And to my right is Daniel  
19 Frumkin, fire protection engineer, from the Office of  
20 NRR, who will speak to you about some of the NEI and  
21 EPRI fire testing.

22 We also have in the audience with us  
23 supporting staff members from NRR who were also  
24 instrumental in the development of this generic  
25 letter.

1           As an overview, I wanted to advise the  
2           Committee that there is a lot of history leading up to  
3           this generic letter. And you will hear some of this  
4           today. We did a bounding analysis, full of risk. We  
5           also did a regulatory analysis of the generic letter.  
6           But at this time, those slides are not in our  
7           presentation. But we are certainly prepared to  
8           discuss those aspects.

9           MEMBER DENNING: We absolutely would like  
10          to see those slides.

11          MR. KLEIN: Very good.

12          So the probability of spurious actuations  
13          due to fires will be presented by Dan Frumkin after I  
14          speak. And then after Dan speaks, we will receive a  
15          summary of the objectives of the generic letter by Bob  
16          Wolfgang.

17          Again, based upon the long history of this  
18          generic letter and so forth, there has been differing  
19          views between the industry and the NRC on the  
20          credibility of multiple spurious actuations. You will  
21          hear about the NEI/EPRI cable fire test results from  
22          Dan Frumkin, as I indicated.

23          I also wanted to indicate to the Committee  
24          that we are continuing with our inspections using  
25          risk-informed aspects. For example, RIS 2004-03,

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1 certainly one of the goals of issuing this generic  
2 letter is to reestablish compliance with the  
3 regulations.

4 That concludes my introductory remarks.  
5 And I'll hand over the presentation to Dan Frumkin.

6 CHAIRMAN WALLIS: When you present, could  
7 you make it clear to me just what it is you are asking  
8 industry to do because I had a lot of trouble figuring  
9 that out. There is a lot of sort of rather vague  
10 requirements it seems to me. And perhaps you can in  
11 your presentation make it clear just what it is they  
12 have to do.

13 MR. KLEIN: Yes.

14 MR. FRUMKIN: Good morning. My name is  
15 Dan Frumkin from the Office of NRR. I work for Sunil.  
16 And today I'm going to present some of the background  
17 from the NEI/EPRI testing that is discussed in the  
18 generic letter.

19 I see some new faces around the ACRS table  
20 so I'm going to pass around some tables from some  
21 testing that occurred. At the end of the cables that  
22 are fused together, you will be able to see two  
23 failure modes or examples of two failure modes. One  
24 is an inter-cable which is two cables -- or actually  
25 one is an intra-cable, which we use these terms intra

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1 within a single cable and inter between two separate  
2 cables. And this provides an example of both.

3 The highlighted portions within a cable  
4 are very close together that have failed together.  
5 And then we also have intruding cable that has  
6 penetrated the outer jacket and apparently the inner  
7 cable protection and come at least into very close  
8 contact which you can see.

9 We will talk also about the different  
10 types of cable. This is a thermal plastic cable,  
11 which is the more vulnerable cable, but as you can  
12 see, that it is subject to both failures from internal  
13 and external cables when put under the suitable heat  
14 or fire exposure.

15 So I'll be providing some background on  
16 the testing that provided the insight into the failure  
17 likelihoods, the objectives of that testing, some  
18 details of the testing, some of the test results, and  
19 a few conclusions based on the testing.

20 And then Mr. Wolfgang will be talking  
21 about the generic letter more specifically.

22 The NEI/EPRI testing was intended to  
23 address fire-induced circuit failure issues of concern  
24 to the NRC staff, principally the potential for  
25 spurious operations of equipment.

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1           This was intended to basically bring to  
2 close the question that the staff kept on bringing up  
3 that Browns Ferry had these and the industry said that  
4 well, it is very unlikely to occur. So this was  
5 intended to bring that to a close.

6           NRC witnessed the testing and also did  
7 some insulation resistant testing using Sandia  
8 National Laboratory resources.

9           And there are four documents that either  
10 in whole or in part document the results of some of  
11 the testing. The characterization of fire-induced  
12 circuit failures results is the big report from EPRI.

13           The circuit analysis failure modes and  
14 likelihood analysis is the Sandia Report of their  
15 insulation resistant testing.

16           These results were pulled into the NUREG  
17 6850, which is the fire protection re-quantification  
18 or the fire PRA methodology for nuclear power  
19 facilities. This is the state-of-the-art document  
20 that Research has developed to -- it is a handbook on  
21 how to do fire PRA.

22           And then there was the spurious actuation  
23 expert elicitation which was experts reviewing the  
24 testing and coming up with results.

25           The objectives, as I said, was to research

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1 the characteristics of fire-induced circuit failures  
2 to better understand these plants' responses to cable  
3 failures. And, as I said, the NRC also was involved  
4 in the testing and reviewed -- witnessed the testing  
5 and did their own insulation resistant testing.

6 So the details of the test, there were 18  
7 fire tests that were conducted between January 9th,  
8 2001 and June 1st, 2001 at the Omega Point  
9 Laboratories in San Antonio. And the three types of  
10 fire exposures were tested during the test. The hot  
11 gas layer region which is up at the ceiling level, the  
12 fire creates a buoyant plume and it fills the  
13 enclosure from the top down. And that is the hot gas  
14 layer.

15 Then below -- between the fire -- the  
16 actual fire and the hot gas layer is what we call the  
17 plume region where there is no flaming but that is a  
18 very hot part of the -- that is the hottest part of  
19 the smoke region of the fire.

20 And they also tested a radiant exposure  
21 where you get close to the fire itself or sometimes  
22 worst case could be up next to the plume region  
23 depending on emissivity of the smoke and the radiant  
24 energy coming off. If it is a clean burning flame, it  
25 may not have a high radiant energy but the smoke may

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1 be higher. So -- but they just used, I believe, a  
2 fixed radiant number but that is a little discussion  
3 of the radiant energy.

4 One thing that they didn't do that I will  
5 add is they did not put cables in the flaming region.  
6 That is why I have this highlighted. We, the staff,  
7 hear a lot from the licensees about how long it takes  
8 to have these cables fail. And that there is plenty  
9 of time in all situations for mitigation.

10 And based on the testing, yes, in a lot of  
11 the testing there was a lot of time before there was  
12 failure in, you know, 30, 40 minutes for some of the  
13 tests. But none of the tests tested this flaming  
14 region.

15 So this leaves the staff a very strong  
16 question of how fast -- well, first we don't know what  
17 failures will occur in that region. They could occur.  
18 They may not occur. We don't have the information.

19 It is very clear that if they do occur,  
20 they will occur much more quickly. The temperatures  
21 are over, you know, much -- a thousand degrees hotter  
22 in the flaming region. And there is also an ignition  
23 source. So it is a very different phenomenon. And  
24 cables could be exposed to a flaming region in the  
25 plant.

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1           So this test is not a complete picture of  
2           -- or let me just say that the timing factors that  
3           came out of the testing that was done are not a  
4           complete picture of the possible scenarios that could  
5           occur.

6           MEMBER APOSTOLAKIS: It appears that you  
7           were participating in the conduct of these tests. Did  
8           you express these concerns to EPRI when they were  
9           designing the tests?

10          MR. FRUMKIN: Well, I wasn't specifically  
11          involved in that. I don't believe that the test was  
12          intended to develop timing. And as such, it wouldn't  
13          have been an issue. The licensees or the industry has  
14          brought this timing issue and perhaps inappropriately  
15          based on the testing.

16          It is useful to heat this cable slowly  
17          because then the hot shorts would probably exist for  
18          a longer period of time. But whether this -- but my  
19          only point is that I don't believe that this testing  
20          provides a basis to say that hot shorts -- this test  
21          I don't think was intended or can provide a basis for  
22          timing. But I believe it is being applied or some  
23          intend to use it to show that there is a timing issue.

24          MEMBER APOSTOLAKIS: I would be such an  
25          obvious thing to do. I mean there must be a reason

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1 why they didn't do it. Do you know that? Or should  
2 we ask Mr. Marrion when he comes?

3 MR. FRUMKIN: Why they didn't do the  
4 flaming region? Yes, that is a fair question. But I  
5 believe the answer -- like I said, I do think that  
6 that was not -- if there hadn't been any failures  
7 outside of flaming region, I think there would have  
8 been a strong feeling that failures in the flaming  
9 region would have been maybe less likely. But it is  
10 a fair question.

11 MEMBER APOSTOLAKIS: Okay.

12 CHAIRMAN WALLIS: Does the material from  
13 which the insulation is made, does that actually burn  
14 at some temperature?

15 MR. FRUMKIN: Yes.

16 CHAIRMAN WALLIS: But if you stuck it in  
17 a flame, you would expect the insulation itself to  
18 catch fire.

19 MR. FRUMKIN: Yes. The ASTM -- or, I'm  
20 sorry, the IEEE 383 fire test that has been the  
21 standard fire test is actually a burning test. And it  
22 ignites the flames from the bottom in a vertical cable  
23 tray. And all the cables do catch on fire when  
24 exposed to flame. But some of them propagate more or  
25 less slowly.

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1           There are some specialized cables that  
2 don't catch on fire but those were not tested. Those  
3 aren't what we are talking about here.

4           So the results of the tests showed with  
5 some confidence that failures within multi-conductor  
6 cables are likely and when they do occur, they occur  
7 in multiple conductors within the same multiple  
8 conductor cable. So as you can see from that cable  
9 bundle, there may actually be more than one cable  
10 conductor within the cable further down the jacket  
11 that you can't see.

12           And then the way they are spiraled  
13 together in there so that various cables could come in  
14 contact with other cables within the same cable.  
15 Various conductors could come into contact with other  
16 conductors within the same cable.

17           In addition, multiple devices were shown  
18 -- the spurious actuation data showed that a single  
19 hot short within a multi-conductor cable usually  
20 effected actuation devices simultaneously. If there  
21 were two devices -- I believe the way they set this  
22 test up is they wanted a very practical approach.

23           So they actually put -- rather than doing  
24 similar to the Sandia testing where they used an  
25 insulation-resistance device, they used actual plant

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1 equipment, which they just plugged it in as they would  
2 in the plant and if it would actuate or not actuate.  
3 So it was a real pragmatic thing and they did actuate.  
4 And as the testing showed, some actuated  
5 simultaneously.

6 MEMBER MAYNARD: Did they also measure how  
7 long the signal stayed there? Or how long it  
8 actuated?

9 MR. FRUMKIN: Yes. And most of the hot  
10 shorts were of a short duration. And some were in the  
11 order of minutes, I believe.

12 This is a table of results of the best  
13 estimates given cable damage of a spurious actuation  
14 probability. And the purpose of this table is not to  
15 -- the purpose of this table is just to show that the  
16 NRC and the industry -- or at least the results from  
17 the EPRI report which was developed by industry, are  
18 very consistent.

19 The staff and the risk people in industry  
20 really are on the same page with the likelihood of  
21 spurious actuations. There are some factors of two  
22 here, differences, but in probabilistic and  
23 likelihoods, in that world it is a small difference.

24 CHAIRMAN WALLIS: This is strange to me.  
25 It must depend on the extent of the damage. I mean if

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1 you just burn a cable for a short time, nothing  
2 happens. If you burn it for long enough, you are  
3 going to get shorts. So you can't just have a  
4 probability. It is going to depend on the extent of  
5 the damage to the cable.

6 MR. FRUMKIN: Yes. In all these, cables  
7 were exposed to damage. So this is given that these  
8 cables were damaged.

9 CHAIRMAN WALLIS: But to what extent?

10 MEMBER APOSTOLAKIS: It is a critical  
11 probability. I mean -- or, as you said earlier --

12 PARTICIPANT: At some point the  
13 probability is one, right?

14 MEMBER APOSTOLAKIS: I mean there is a 0.6  
15 conditional probability that you will have a spurious  
16 actuation. This is conditional on the probability  
17 that the cable is damaged.

18 MR. FRUMKIN: Correct.

19 MEMBER APOSTOLAKIS: And what is that?

20 MR. FRUMKIN: That depends on the  
21 scenario. For example, if a cable is a foot above a  
22 piece of switch gear or let's say -- and this is not  
23 an unlikely situation -- a foot above 20 or 30 feet of  
24 switchgear. It runs across the cable tray, across the  
25 top of a number of pieces of switchgear, what is the

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1 probability?

2 Well, that could be calculated typically,  
3 I think, a single piece of switchgear is five times E  
4 to the minus five. Or, you know, in that range. But  
5 then it certainly would be damaged if there was even  
6 a small fire in that piece of switchgear.

7 So there is -- you could have cable -- and  
8 then that same cable does go through different areas  
9 where it could be exposed to different other fires.  
10 A single cable could go through three, four, five  
11 different areas and be exposed to a dozen different  
12 fire scenarios.

13 MEMBER DENNING: I think we have to  
14 recognize the context within which this is done,  
15 George. And I think it is important when we try to  
16 get into the question of risk informing this and that  
17 is basically we are doing a deterministic safe  
18 shutdown analysis in which you assume there is a fire  
19 in a zone -- in a fire area. And it can burn there  
20 for three hours. You know even though there are other  
21 mitigating things that would clear that, we assume it  
22 can burn for three hours.

23 So then the question is well, with this  
24 massive potential exposure, then you have got a cable  
25 running through there. What's the potential that it

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1 could then be heated up to a point at which you get  
2 this kind of interaction? You know it doesn't get at  
3 all into the questions of you have a fire in a room,  
4 what is the possibility that any cables are exposed,  
5 you know, before it is controlled.

6 MEMBER APOSTOLAKIS: But if we are doing  
7 a deterministic analysis, why are we calculated  
8 spurious actuation probabilities?

9 MEMBER DENNING: Well, let me give my view  
10 but I'd certainly like to hear your view, and that is  
11 that the question is not so much whether you can have  
12 spurious actuations but how many can you have? How  
13 many combinations of things can you deal with?

14 The industry has always agreed to looking  
15 at a spurious actuation on a one-at-a-time basis, you  
16 know. And so I think that what the staff is trying to  
17 do is to give the feeling that -- or their impression  
18 that this isn't the really rare event -- the extremely  
19 rare event that actually would have some kind of  
20 spurious actuation occurring.

21 And then I think by implication then maybe  
22 there is the potential for multiple spurious  
23 activations.

24 MEMBER APOSTOLAKIS: Well, the second  
25 bullet of the previous slide, I guess, is then the

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1 key, right? Is that what -- of devices?

2 MEMBER DENNING: Well, I would be curious.  
3 What is your -- if you were answering that question,  
4 how would you have answered George's question? Why  
5 are we looking at probabilities here now?

6 MR. FRUMKIN: Well, okay, maybe this slide  
7 was poorly planned. But the point of the slide is  
8 twofold. One is to say that with regard to  
9 probabilities, the staff and the industry people who  
10 do this work are on the same page.

11 And the second reason, I guess, is to show  
12 that these probabilities are very high in  
13 probabilistic space, that some of them are close --  
14 you know, 0.6, and then if you have a 0.6 scenario and  
15 you have two 0.6 scenarios, you've got a 0.36  
16 scenario. So that even multiple can be a fairly high  
17 probable.

18 MEMBER DENNING: Now help us though -- you  
19 can't say that without giving some conditionality of  
20 --

21 MR. FRUMKIN: Right.

22 MEMBER DENNING: -- 0.6 conditions on  
23 what?

24 MR. FRUMKIN: Cable damage.

25 MEMBER DENNING: Cable damage.

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1                   MEMBER ARMIJO: I have a problem with  
2 cable damage. Is this severe? Moderate? I have no  
3 feeling of -- I can see where all the insulation is  
4 burnt to a crisp and I would call that severe.  
5 Wouldn't these probabilities all be one?

6                   MR. FRUMKIN: No. Well, okay, so what  
7 this is talking about is the spurious actuation  
8 probability, not shorting situation. This is the  
9 likelihood of a hot short occurring within a cable  
10 without that cable shorting to its conduit or cable  
11 tray because generally once the hot conductors fail to  
12 the conduit or cable tray or the nearest ground, then  
13 they would certainly -- that would clear the spurious  
14 actuation.

15                  MEMBER MAYNARD: Okay. But I think there  
16 is a high probability if you make all the assumptions  
17 to get to this point. But you also have to factor in  
18 the probability of actually having a fire, for the  
19 fire going that long, for the operators not taking any  
20 action. There are a lot of other things getting up to  
21 that point that when you put it all in context --

22                  MEMBER APOSTOLAKIS: That is why I'm  
23 confused. We are either doing deterministic analysis  
24 or we are doing risk analysis. If we do risk  
25 analysis, then, of course, we have to do all this. If

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1 we do what Rich said, then it seems to me they are  
2 gone.

3 I mean you have three hours. Everybody is  
4 burning, right? I think as I recall from the early  
5 studies on this the real question is whether you will  
6 have a short -- a hot short first before an open  
7 circuit.

8 MR. FRUMKIN: Right. Before the short  
9 ground.

10 MEMBER APOSTOLAKIS: That is the critical  
11 thing.

12 MR. FRUMKIN: Yes.

13 MEMBER APOSTOLAKIS: And this is not  
14 answering that, is it?

15 MR. FRUMKIN: Yes, it is.

16 MEMBER APOSTOLAKIS: It is?

17 MR. FRUMKIN: This is the likelihood of  
18 that spurious actuation probability, not a short to  
19 ground.

20 MEMBER APOSTOLAKIS: Okay.

21 CHAIRMAN WALLIS: This is one spurious  
22 actuation.

23 MR. FRUMKIN: This is a single.

24 CHAIRMAN WALLIS: A single one although  
25 there are multiple wires in the cable?

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1 MR. FRUMKIN: Right. Well, this is a  
2 spurious actuation getting cable to damage within a  
3 cable or between -- there is an inter-cable factors  
4 here -- between two cables. So the point -- let's  
5 just say the 0.6 here is for within a single thermoset  
6 cable, the 0.2 or the 0.4, as the 6850 has it, is  
7 between -- or generally it is 0.3 is what has been  
8 used a lot -- is between two separate thermoset cables  
9 within the same tray.

10 And what the previous slide was trying to  
11 say is that within a single thermoset -- within a  
12 single multi-conductor cable, that more than one of  
13 the conductors are going to fail together with an 80  
14 percent likelihood. So it almost for sure that if  
15 let's say you have one hot conductor and four control  
16 conductors that could actuate four different pieces of  
17 equipment, that hot conductor will come into contact  
18 probably with all of them with the same likelihood,  
19 with this same 0.6.

20 CHAIRMAN WALLIS: Oh, with the same  
21 likelihood?

22 MR. FRUMKIN: Yes. It's not a 0.6 times  
23 0.6 times 0.6 in the same cable. Within that cable it  
24 is 0.6 times 0.8, if you will.

25 CHAIRMAN WALLIS: Okay.

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1 MR. FRUMKIN: So it is still -- it is  
2 almost 0.6.

3 MEMBER DENNING: Why are the inter-cable  
4 probabilities the same for thermal plastic and  
5 thermoset?

6 MR. FRUMKIN: Because -- oh, you mean this  
7 and this?

8 MEMBER DENNING: Yes.

9 MR. FRUMKIN: Inter-cable -- yes, I'm not  
10 -- that's just a -- well, intra-cable is very likely  
11 --

12 MEMBER DENNING: Intra-cable, I understand  
13 that.

14 MR. FRUMKIN: Yes, I don't -- I don't have  
15 --

16 CHAIRMAN WALLIS: What is the question,  
17 Rich?

18 MEMBER DENNING: It's thermoset is less  
19 likely -- one would think thermoset would be less  
20 likely to have inter-cable and perhaps they are the  
21 same here because there just haven't been any  
22 experiments done on a thermoset.

23 MR. FRUMKIN: I think that is it because  
24 you can see that that is one of the big differences,  
25 a factor of two here, and again the same factor of two

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1 for intra-cable -- inter-cable -- but yes, we're -- as  
2 Roy Woods is here, and we're doing more testing on  
3 this. But this is currently the state-of-the-art data  
4 on this.

5 And I can't explain the -- it's just that  
6 is what the data showed from the limited 18 tests.

7 CHAIRMAN WALLIS: Now we are talking about  
8 whether you are doing probabilistic or deterministic  
9 analysis. When we get to the generic letter, there  
10 are strange terms such as saying the licensee must  
11 assume the possibility of simultaneous multiple  
12 spurious actuation -- well that tells me nothing.

13 I'm assuming the possibility -- it says  
14 nothing about whether it is likely to be one or 0.6 or  
15 whatever.

16 MEMBER DENNING: What they are saying is  
17 one.

18 CHAIRMAN WALLIS: What does it mean?

19 MEMBER DENNING: It means one.

20 CHAIRMAN WALLIS: So possibility means a  
21 probability of one?

22 MEMBER DENNING: That's -- yes.

23 CHAIRMAN WALLIS: That wasn't clear to me  
24 at all. Okay.

25 MEMBER APOSTOLAKIS: We will come to the

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1 letter, I guess.

2 MEMBER DENNING: Yes. Continue.

3 MR. FRUMKIN: These are just some notes on  
4 the previous slide that some of the plants that use  
5 the CPTs, which are the control power transformers,  
6 that reduces the likelihood of spurious actuations.

7 MEMBER APOSTOLAKIS: All of these  
8 probabilities, of course, mean nothing now.

9 MR. FRUMKIN: Right, yes.

10 MEMBER APOSTOLAKIS: They are one.

11 MR. FRUMKIN: Okay. Well --

12 MEMBER DENNING: But we are going to get  
13 to risk informing at some point here.

14 MR. FRUMKIN: Absolutely. Right. So  
15 those were just notes on the previous slide which was  
16 unfortunately put in here.

17 In conclusion, a review of the test data  
18 readily illustrates that hot shorts often involve more  
19 than one conductor. And that concurrent hot shorts  
20 within a cable are probable and should be considered  
21 during circuit analysis.

22 That's the end of this presentation. And  
23 the point of this is just to lay the groundwork that  
24 simultaneous spurious actuations and simultaneous  
25 multiple spurious actuations have been shown by

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1 testing, by industry testing, to occur.

2 MEMBER DENNING: Now there is more testing  
3 that is in progress. It is your feeling that that  
4 testing could then -- will it be done within a time  
5 period where we add value to the licensee when the  
6 licensee is basically responding the generic letter?

7 MR. FRUMKIN: Yes, that testing is planned  
8 to be done by the end of the year. And that pool of  
9 data will be available -- certainly for risk-informed  
10 evaluations for the licensees to use. But the experts  
11 doing the testing don't believe that there is going to  
12 be -- they believe these numbers are going to be  
13 honed.

14 They believe that there are going to be  
15 more cable combinations tested here than in the 18  
16 EPRI tests -- EPRI/NEI tests. But they don't believe  
17 that for the information that was on that table are  
18 going to be changed by an order of magnitude. It's  
19 maybe a 50 percent change or something of that nature.

20 MEMBER DENNING: If we have time later on,  
21 could we have a short presentation by someone about  
22 what is still to happen? And what different  
23 configurations basically have been untested at this  
24 point that will be tested?

25 MR. FRUMKIN: Well, Roy Woods is sitting

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1 behind you. And I'm not sure if he is prepared to  
2 talk about this testing.

3 MEMBER DENNING: Let me say I'm not asking  
4 for you to do it right now. But do you think you  
5 could do it later?

6 MR. WOODS: Sure. Roy Woods, RES. Yes,  
7 certainly we can make a presentation to you whenever  
8 you want on the testing. The plans are well made. We  
9 are about to start within days or a week at most. It  
10 is actually about to happen.

11 MEMBER DENNING: Okay. Well, let's go  
12 ahead --

13 MR. FRUMKIN: I think they want something  
14 later this morning, right?

15 MEMBER DENNING: Yes, later this morning.  
16 Absolutely, yes. Later this morning.

17 MEMBER APOSTOLAKIS: That's what happens  
18 when you have three hours.

19 MEMBER DENNING: Right, yes. Thanks. Can  
20 you run any of those tests by eleven?

21 MR. WOLFGANG: My name is Bob Wolfgang.  
22 I'm a fire protection engineer in NRR. And I'm going  
23 to give you information on the draft generic letter  
24 Post-Fire Safe-Shutdown Circuit Analysis Spurious  
25 Actuations.

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1           A summary of the presentation, I'll go  
2 over the purpose of issuing the generic letter, the  
3 information we are requesting from licensees, the  
4 background on this issue since 1997, the basis for the  
5 generic letter, the issue that is clarified in the  
6 generic letter, public comments, and a summary at the  
7 end.

8           The purpose of issuing the generic letter  
9 is to clarify how the NEI/EPRI cable fire test program  
10 reaffirms long-held regulatory positions and provide  
11 part of a foundation for licensees who are planning to  
12 transition to NFPA 805.

13           Also, to respond to the Agency's need to  
14 provide clarification and closure of outstanding fire  
15 protection issues, respond to --

16           MEMBER APOSTOLAKIS: Excuse me. Are you  
17 going to come back to these? I mean this on slide 16,  
18 the foundation for licensees planning to transition,  
19 will you elaborate on these later? Or can you tell us  
20 a few words now?

21           MR. WOLFGANG: Well, that's --

22           MEMBER APOSTOLAKIS: Why is that relative  
23 to NFPA 805?

24           MR. WOLFGANG: This is just to show that  
25 multiple spurious actuations should be included in

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1 their risk analysis model.

2 MEMBER DENNING: Well, since George has  
3 raised the question, let me ask it now. And that is  
4 NFPA 805 is one of the ways -- transitioning to NFPA  
5 805 is one of the ways that a licensee can respond to  
6 this. Now my question is how long does it take to  
7 transition to NFPA 805?

8 And I don't quite understanding within the  
9 time periods of the 90 days and six months and this  
10 kind of stuff, within the context of a transition to  
11 NFPA 805, when did that transition actually have to  
12 occur for the licensee to be able to use that pathway?

13 MR. WOLFGANG: All they have to do is  
14 respond to us within I believe it is the 90 days.  
15 That they are transiting to NFPA 805. And they will  
16 take care of this situation during that process.

17 MEMBER DENNING: Then how long would they  
18 have to transition to NFPA 805?

19 MR. WOLFGANG: They have -- what is it?  
20 Is it three years?

21 PARTICIPANT: Three years.

22 MEMBER DENNING: Three years?

23 MEMBER APOSTOLAKIS: Yes, it is a long  
24 time.

25 MR. KLEIN: Let me describe briefly. This

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1 is Alex Klein. Let me briefly describe the process a  
2 licensee would use if he wants to transition to NFPA  
3 805. And that is once the licensee had made the  
4 determination that he does want to transition to 805  
5 because that is an option for him, if he submits a  
6 letter of intent to the agency indicating that that is  
7 what he wishes to do.

8 At that point, we review that letter and  
9 make a determination as to whether or not the schedule  
10 that the licensee has laid out is acceptable to the  
11 Agency. And what we have right now in place is a  
12 three-year time frame for licensees to transition with  
13 the option of extending that time frame if the  
14 licensee can provide us with sufficient justifications  
15 beyond the three-year time period.

16 Now within that three-year time period, a  
17 licensee would submit their letter of intend, do the  
18 act of transition into NFPA 805. And then before that  
19 three-year time period is over, we would submit their  
20 license amendment to the staff for our review and  
21 approval prior to them actually receiving the  
22 amendment.

23 MEMBER APOSTOLAKIS: It seems to me that  
24 the -- actually is the first bullet in the previous  
25 slide that is important because the licensee that

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1 wants to transition to NFPA 805 has to convince you,  
2 I think, that they complied with all the regulations,  
3 right? There may be a few exceptions, as I remember  
4 for a period of time, and all that.

5 So the primary reason seems to be to  
6 reaffirm long-held regulatory positions because  
7 somebody who wants to transition has to demonstrate  
8 that they complied with all that.

9 MR. KLEIN: That is correct. Really I  
10 think the primary purpose of the generic letter is  
11 that first bullet on that slide 16.

12 MEMBER APOSTOLAKIS: Right, right.

13 MR. KLEIN: Yes. As an added benefit, it  
14 does provide the foundation for licensees who want to  
15 transition to 805.

16 MEMBER DENNING: Now wait a second. I  
17 definitely did not understand this. I mean clearly  
18 there are a lot of licensees out there that did not --  
19 cannot respond to multiple spurious actuations. And  
20 they are not going to have to bring their plant into  
21 compliance with having to meet all the multiple  
22 spurious actuations before going to NFPA 805 because  
23 then NFPA 805 doesn't help them at all, right?

24 MR. FRUMKIN: Yes, that is correct. And  
25 what Dr. Apostolakis was saying is correct is that we

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1 have an enforcement discretion in place so those  
2 licensees who discover during transitions that they  
3 are not in compliance can do a risk analysis of that  
4 and determine that it is not red, that it is not  
5 wilful, that it is not a severity one violation.

6 And, therefore, they can comp it -- put  
7 compensatory actions in place and move forward towards  
8 transition without necessarily correcting that in  
9 accordance with the old fire protection program.

10 MEMBER DENNING: But one thing that I  
11 think is an issue though and that is suppose there is  
12 a plant out there that would really like to do the  
13 NFPA 805 approach but within the 90-day period, don't  
14 they have to go through the entire analysis and  
15 identify the SSCs that are potentially vulnerable  
16 based upon this detailed multiple spurious actuation  
17 evaluation which seems to me like an extremely  
18 difficult problem to undertake.

19 Is that true that they have to really  
20 analyze the whole system within 90 days according to  
21 this multiple spurious actuations and identify  
22 vulnerable SSCs? Am I correct or not correct?

23 MR. WOLFGANG: Well, they have to -- well,  
24 I'll get to that on a slide here.

25 MEMBER DENNING: Okay, if you will get to

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1 it, you can go ahead.

2 MEMBER MAYNARD: I would like to challenge  
3 that first statement just a little bit though. And I  
4 know that it has been a long-held position by members  
5 of the staff but as far as, you know, NRC position,  
6 there are a number of licenses that were issued and  
7 plants inspected and with their programs were approved  
8 and licensed without making this assumption.

9 And I'm not convinced that it has clearly  
10 been a recognized regulatory requirement. And again,  
11 I know licenses were issued, programs were reviewed  
12 without making -- otherwise, we wouldn't even be here  
13 today if those licenses weren't issued at that time.  
14 So I would challenge that. The first statement.

15 MR. WOLFGANG: We know SERs have been  
16 issued for Byron and Braidwood with a single spurious  
17 actuation per fire event. And we've come to the  
18 conclusion basically that was issued as a mistake.  
19 That was a mistake.

20 MEMBER MAYNARD: But I know that there are  
21 a lot of plants out there a license. Their analysis  
22 were reviewed, their programs were reviewed. I know  
23 I was personally involved with them back in the '80s  
24 when some of these issues were starting to come to a  
25 highlight. And I know that there are a number of

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1 plants out there with licenses that although it may  
2 not be documented as clearly, that it was known that  
3 multiple spurious actuations were not taken in account  
4 in that analysis.

5 I don't think it is clear that this is  
6 just confirming compliance to requirements that were  
7 in place. I think it is a different set of  
8 assumptions.

9 MR. FRUMKIN: Yes, and this may, I agree  
10 that your assumptions apply to probably a number of  
11 plants out there. But for the most part, Appendix R,  
12 10 CFR 50, Appendix R, Section 3(g)(ii) and 3(g)(ii)  
13 which is the alternate and dedicated shutdown are what  
14 is in question.

15 The NRC went in and did an analysis of the  
16 3(g)(iii) alternate shutdown. And for a lot of  
17 3(g)(iii) which is, for lack of a better description,  
18 a control room abandonment, they allowed the  
19 assumption of one spurious actuation. 3(g)(ii) wasn't  
20 across the board inspected in the 80s. It was assumed  
21 that licensees could wrap or protect or would have  
22 adequate separation.

23 And it wasn't evaluated for multiple  
24 spurious because generally the staff didn't believe  
25 that -- well, I'm not sure why they didn't do it. But

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1 the big question was this alternate shutdown.

2 And in the 90s, we had the thermal lag.

3 And a lot of that wrap was taken out. And a lot of  
4 manual actions or assumptions were put into place.

5 And I don't mean to say that there was -- well, the  
6 point that I am trying to make is that there was  
7 another change. There was the removal of a lot of  
8 these thermal lag which was relied on to protect  
9 cables and probably would have mitigated many spurious  
10 actuations, many multiple spurious.

11 MEMBER MAYNARD: And I'm not saying at  
12 this point that they shouldn't be considered now. I'm  
13 challenging the regulatory positions that says all  
14 along everybody should have always done this. I think  
15 that, you know, we're now setting, you know, these are  
16 the things that definitely need to be considered.

17 If those were considered 20, 30 years ago,  
18 if that was part of the regulatory position for the  
19 licenses, we wouldn't have gone through a 20-year  
20 period here of trying to figure out what it really  
21 requires the licensee to do. Again, it's a regulatory  
22 -- I believe that this is something that falls within  
23 the backfit.

24 It needs a better analysis overall. And  
25 that doesn't mean that it is a bad thing to do. I'm

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1 just saying that I do not believe that we can take the  
2 position that this is a requirement that has already  
3 been there, that everybody should have already done.  
4 And that is kind of what we are saying in this generic  
5 letter.

6 MR. KLEIN: This is Alex Klein of NRR. I  
7 just wanted to add to the discussion here that -- and  
8 Bob can clarify this also for me -- is that the  
9 generic letter did receive CRGR approval. We did go  
10 to that Committee.

11 There are subsequent slides in Bob's  
12 presentation, I think 23, 24, 25, that does talk  
13 about the background, the regulatory background that  
14 you are speaking of that might clarify some of these  
15 discussion questions.

16 MEMBER MAYNARD: I'd be glad to look at  
17 that.

18 MR. WOLFGANG: Well, and also attend CFR  
19 Part 50, Appendix R, it also talks about you have to  
20 consider hot shorts. It doesn't set a limit on the  
21 number.

22 MEMBER MAYNARD: Well, I understand that.  
23 But there is a number of the regulations that come to  
24 an agreement between the licensee and staff as to what  
25 are -- what do you have to assume in a number of those

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1 things.

2 So anyway, we will get into it maybe aq  
3 little more with the regulatory evaluation. But I do  
4 not agree that --

5 CHAIRMAN WALLIS: Well, could we clarify  
6 this first bullet? I mean it seems to me that if we  
7 did have this long-held regulatory position, which was  
8 being enforced, then you wouldn't need this generic  
9 letter.

10 MEMBER MAYNARD: Right.

11 CHAIRMAN WALLIS: So something has changed  
12 as the result of these tests. So maybe there was a  
13 position which wasn't very well enforced or something  
14 or was not properly interpreted by the industry. Is  
15 that the problem?

16 MEMBER MAYNARD: Or the staff?

17 CHAIRMAN WALLIS: Well, the staff, yes.

18 MR. FRUMKIN: Well, I think we -- well,  
19 Bob, I think I would say that something did change.  
20 And that thing may not have been entirely the tests.  
21 I think that the staff had high confidence that these  
22 fire barriers that were installed were separating  
23 these redundant trains.

24 And they were removed and they were  
25 replaced with non-barrier solutions which were

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1 analysis, manual actions, and those type of things.  
2 And as soon as the NRC started inspecting post-thermal  
3 lag fixes, which was in 1997, well before these tests.

4 We had numerous -- there was an information notice  
5 97-something which presented numerous hot short and  
6 multiple -- well, numerous alternate associated  
7 circuits and circuit failure type issues.

8 So to hang this entirely on the test is  
9 not -- certainly the staff position goes before -- to  
10 before the tests. And that has been documented in  
11 that generic -- that information notice and there was  
12 a letter sent to NEI which expressed this sentiment  
13 well before -- I believe that was before the test as  
14 well.

15 CHAIRMAN WALLIS: The purpose of the  
16 generic letter is to reinforcement your enforcement  
17 which you were a bit lax about before or something?  
18 Is that what its purpose is?

19 MR. WOLFGANG: There was a lot of  
20 confusion. You were talking about 3(g)(iii) about  
21 alternative and dedicated shutdown systems and the use  
22 of one only -- you had to consider one spurious  
23 actuation there --

24 MR. FRUMKIN: Right, 3(g)(iii) and the  
25 Generic Letter 86-10 talked about spurious actuations

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1 quite a bit but the staff position is that those  
2 didn't apply to 3(g)(ii) and they were erroneously  
3 applied to 3(g)(ii), which is all we're really talking  
4 about right now. We are not talking about these 3(g)  
5 (iii) inspections that occurred in the 80s. We're not  
6 talking about the 3(g)(iii) approvals.

7 Every 3(g)(iii) program should have been  
8 approved with an SER. That was the policy. But we  
9 did not go into the 3(g)(ii) areas because the  
10 barriers and those solutions should have been  
11 sufficient.

12 MEMBER MAYNARD: It just seems to me that  
13 with all the confusion that has gone on for a number  
14 of years on this, a much cleaner way of doing this is  
15 if the NRC believes that this is something that needs  
16 to be done is just to come out with it as a  
17 requirement following the process for rulemaking, for  
18 changes, or whatever rather than trying to handle it  
19 through a generic letter requesting information to  
20 show compliance with a very confusing set of  
21 requirements.

22 MEMBER-AT-LARGE SIEBER: I suspect,  
23 though, that the staff does not believe that  
24 rulemaking is required, that the proper regulations  
25 already exist.

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1 MR. FRUMKIN: That is correct.

2 MEMBER-AT-LARGE SIEBER: In the review  
3 process that the staff has used in the past does not  
4 establish new regulations. The regulations are the  
5 regulations. And how the staff reviews something is  
6 another matter.

7 MEMBER MAYNARD: Well, how they review it  
8 but what it is accepted as to your certain assumptions  
9 and things --

10 MEMBER DENNING: I'm sure we are going to  
11 come back to this issue. So why don't you go ahead --

12 MEMBER-AT-LARGE SIEBER: It won't go away.

13 MR. WOLFGANG: Okay, moving to the next  
14 slide, more purposes of issuing a generic letter,  
15 respond to the Agency's need to provide clarification  
16 and closure of outstanding fire protection issues,  
17 respond to the licensee's request to provide  
18 clarification of regulatory expectations, and respond  
19 to the region's request to provide clarification of  
20 regulatory expectations for circuit inspections. And  
21 circuit inspections were resumed January 2005.

22 Generic letter, what information it is  
23 requesting from the licensees. Within 90 days to  
24 evaluate their licensing basis and information in the  
25 generic letter regarding multiple spurious actuations

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1 in the Post-Fire Safe-Shutdown Circuit Analysis.

2 MEMBER MAYNARD: Is that practical to  
3 expect -- I think we might get into a little bit more  
4 as to what we are really asking here but within 90  
5 days, for the whole industry to do this, I'm sure  
6 there is going to be some resources -- external  
7 resources needed in some cases.

8 With the whole industry trying to use  
9 those, is 90 days really a practical time frame to get  
10 what is really being asked for here?

11 CHAIRMAN WALLIS: Well, we believe that it  
12 is. But, you know, I guess when NEI talks, they have  
13 a consensus from the industry that it is not a  
14 sufficient time, We can always adjust that.

15 MR. WOLFGANG: Yes, I think what is being  
16 asked here is not for the technical evaluation of the  
17 entire circuit analysis. What we are asking for is  
18 for licensees to report whether they have a multiple  
19 spurious licensing basis or they have a single  
20 spurious licensing basis.

21 For those plants that have a multiple  
22 spurious and haven't analyzed for multiple spurious,  
23 then that is going to be a long-term fix. All we are  
24 asking them to do is to report their situation within  
25 90 days, which is a licensing --

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1                   MEMBER DENNING: Wait a second. How do  
2 they submit their functionality assessment of effected  
3 SSCs without doing that total analysis? Am I missing  
4 something here? And this is within 90 days, if  
5 you're not in compliance, you have to submit this  
6 functionality assessment of effected SSCs.

7                   MEMBER APOSTOLAKIS: And compensatory  
8 measures.

9                   MEMBER DENNING: And compensatory  
10 measures. I think that is the whole analysis, isn't  
11 it? I mean you don't necessarily know how you are  
12 going to ultimately correct them but it seems to me  
13 that the analysis has to be done in 90 days.

14                   Incidentally, I should have mentioned that  
15 listening in is EPM, which is a company that does this  
16 kind of stuff. But I should have mentioned that  
17 earlier that we do have an open line here.

18                   I'm sorry, go ahead.

19                   MR. WOLFGANG: Yes, what we are asking --  
20 yes, to submit the functionality assessment of  
21 effected SSCs.

22                   MEMBER DENNING: Yes. How do you  
23 determine what SSCs are effected unless you have  
24 looked at the multiple spurious actuations.

25                   MR. WOLFGANG: Yes, they have to look at

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1 the multiple spurious actuations.

2 MR. FRUMKIN: First, I agree with the  
3 member that doing a full analysis for 104 plants in 90  
4 days is not going to be credible. This is a major  
5 effort to look at that.

6 I believe though that the second bullet of  
7 compensatory measures for these areas where the plants  
8 are capable of putting compensatory measures and then  
9 solving the problems in a long-term program. That is  
10 credible. That is possible.

11 MEMBER APOSTOLAKIS: It seems to me that  
12 the 90 days applies to the first bullet but not the  
13 sub bullets.

14 MEMBER MAYNARD: I think it does a -- it  
15 certainly applies to the first bullet.

16 MEMBER DENNING: But the sub bullets are  
17 there in the generic letter.

18 CHAIRMAN WALLIS: Well, why is there an  
19 assumption that they are not in compliance now? I  
20 mean that they have done various things today to meet  
21 the regulations already. And their position would  
22 probably be we are in compliance now. So what are you  
23 asking us to do?

24 MEMBER DENNING: No, I don't think so.

25 MEMBER-AT-LARGE SIEBER: Well, if you took

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1 the lag out of your plant --

2 CHAIRMAN WALLIS: That's the problem.  
3 They have changed something.

4 MEMBER-AT-LARGE SIEBER: You changed the  
5 configuration.

6 CHAIRMAN WALLIS: That is okay. So they  
7 have changed something. Thank you.

8 MEMBER DENNING: It is not just that,  
9 Graham. They have argued that this has not been the  
10 requirement. That you didn't have to do multiple  
11 spurious actuations. They did one at a time or a  
12 single. So they would argue this is not the  
13 regulatory -- they would argue that it is new  
14 requirement but kind of like Otto has.

15 MEMBER KRESS: But the regulation says  
16 broadly that under these conditions, you have to have  
17 one train of safe shutdown. And that can only be  
18 interpreted as multiple spurious actuation I think.

19 MEMBER MAYNARD: I don't think -- I don't  
20 agree with that. Through the regulatory process, you  
21 don't necessarily have to assume everything that  
22 anybody could ever conceivably come up with. And so  
23 that's why the NRC and the industry -- but you decide  
24 on a set of assumptions. And what you really have to  
25 assume to reasonably meet that requirement.

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1           And then as new information comes along,  
2           if those previous assumptions weren't conservative  
3           enough, you may need to do that. But that really  
4           constitutes a change there. Otherwise why would you  
5           have any guidance documents or any -- what is allowed  
6           to assume or whatever. So I would argue that it is  
7           part of it.

8           MEMBER DENNING: In some respect, this is  
9           an open-ended problem in terms of, you know, and so it  
10          begs for some kind of guidance as to where you end the  
11          search for things that can go wrong.

12          Continue.

13          MR. WOLFGANG: We are asking that within  
14          six months to submit the plan to return all effected  
15          SSCs to compliance with the regulatory requirements.  
16          And that is the plant modifications, license .  
17          Exemption request.

18          And we are also asking that within 30  
19          days, if you cannot meet the 90-day, six month  
20          schedule that we are requesting, you provide us  
21          notification you cannot meet it and your suggested  
22          schedule and completion date.

23          CHAIRMAN WALLIS: What kind of things  
24          would they do to come into compliance? Are they going  
25          to change these offending cables? Are they going to

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1 change the way in which they put out fires? Are they  
2 going to change the actual equipment in the SSC? It  
3 is very open ended what they are expected to do.

4 MR. WOLFGANG: Yes, they can protect  
5 cables. They can reroute cables. They can submit  
6 license amendments based on a risk analysis method --  
7 those type of things.

8 CHAIRMAN WALLIS: Manual actions?

9 MR. WOLFGANG: Well, not in 3(g)(ii)  
10 space. There are a lot of ways.

11 MEMBER DENNING: I don't know how  
12 expensive those ways are. I mean we say there are  
13 lots of ways but those ways may be extremely  
14 expensive.

15 CHAIRMAN WALLIS: Well, I'm also unclear  
16 about what it is they are supposed to assume can go  
17 wrong? When I read these things about they are  
18 supposed to assume the possibility that this can  
19 happen, it goes back to Otto's question here.

20 I mean if you assume the very worst that  
21 could possibly happen, then you could have enormous  
22 changes in the plants in order to avoid this worst  
23 conceivable thing. Is that what you are asking them  
24 to do?

25 MR. WOLFGANG: You have to assume all

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1 multiple spurious actuations.

2 CHAIRMAN WALLIS: Well, but that is a  
3 major thing, isn't it?

4 MEMBER MAYNARD: That is major.

5 CHAIRMAN WALLIS: You have to assume that  
6 it happens with the probability of one?

7 MR. WOLFGANG: Yes.

8 MEMBER-AT-LARGE SIEBER: Yes. On the  
9 other hand --

10 MR. WOLFGANG: 3(g)(ii) in deterministic  
11 space doesn't limit the number of --

12 MEMBER-AT-LARGE SIEBER: On the other  
13 hand, you restrict the fire to a single fire area,  
14 which means that if you have appropriate separation or  
15 fire barriers that you have a train that is free of  
16 fire, that will operate.

17 MR. WOLFGANG: Right.

18 MEMBER-AT-LARGE SIEBER: And that is the  
19 principle. I think it is going to vary dramatically  
20 from plant to plant, especially based on the age of  
21 the plant and the type of plant. I think some are  
22 going to be tremendously impacted. Some others may  
23 not. And again, depending on what assumptions you  
24 really have to make and what credit you can take for  
25 things you already have in place, things that have

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1 already been done, everything from operator actions to  
2 fire loadings, improvement in fire control,  
3 everything.

4 MEMBER DENNING: And, Jack, you talked  
5 about the separating of trains. And that's, you know,  
6 pretty straight forward. But isn't the real open  
7 endedness related to the spurious actuations where  
8 there is some unanticipated valve opens that effective  
9 give you a loss of coolant accident or something like  
10 that, that, you know, introduces a different element  
11 to safe shutdown. Isn't that the open-endedness that  
12 makes it so difficult.

13 And I also don't know whether -- how many  
14 plants really know what cables are in what trays  
15 within a room.

16 Obviously if you are going to do -- yes so  
17 that you basically are assuming anything within the  
18 room -- I mean you know that -- you have concluded  
19 that it has gone through a room up to this point.  
20 But, you know, they could be in totally different  
21 trays in the room. But you don't know where they are  
22 in the room.

23 CHAIRMAN WALLIS: Well, you have to assume  
24 that they are all together and they are all --

25 MEMBER DENNING: Assume that you have to

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1 submit it. But I don't know the answer to that.

2 MEMBER KRESS: Assume that you have to do  
3 it. But I don't know the answer to that.

4 MR. WOLFGANG: Well in a fire area in a  
5 room, if you assume a fire, you have to assume  
6 everything is --

7 MEMBER KRESS: Yes, but can everything  
8 have an inter --

9 CHAIRMAN WALLIS: Everything in that room  
10 can short together?

11 MEMBER KRESS: -- can it short together as  
12 an inter-cable connection even though it may be way  
13 separated?

14 MR. FRUMKIN: No, if it couldn't occur,  
15 then it wouldn't be -- I mean you wouldn't have -- we  
16 wouldn't be expecting energized cables to penetrate  
17 conduits. We wouldn't expect energized cables to jump  
18 from tray to tray.

19 Or, for example, DC current has to have  
20 the same path. If it is not in the same tray or same  
21 conduit you couldn't actuate that from an AC circuit  
22 or something of that nature.

23 MEMBER DENNING: I don't know whether --  
24 what utilities know what cables --

25 MR. FRUMKIN: Right, no, you are correct.

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1                   MEMBER DENNING: -- are in what trays you  
2 were going to run.

3                   MR. FRUMKIN: And that can be a very  
4 significant effort.

5                   One of the aspects is that for the  
6 3(g)(ii) area -- or for the 3(g)(iii) plants, some of  
7 the older plants are 3(g)(iii). And they don't have  
8 very much separation at all. But they have done a  
9 significant analysis that was reviewed in the 80s  
10 which we referred to earlier. And they do have the --  
11 because they have done that detailed analysis, they  
12 have the flexibility to do manual actions.

13                   So in effect, the newer plants with the  
14 good separation should be fairly well off. The older  
15 plants that had very little separation probably have  
16 done a lot of this analysis already and may already be  
17 in compliance.

18                   It is the middle plants that are more  
19 likely than the older plants to have the circuits  
20 traced. But they are kind of in the middle there.  
21 And they are the ones who I think are going to be  
22 having a more difficult time answering this generic  
23 letter.

24                   MEMBER-AT-LARGE SIEBER: That is a pretty  
25 limited number of plants then. This issue is, you

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1 know, I was a young man when this issue came out. The  
2 work has been done. And the plants that were built in  
3 the 80s, to my knowledge they all had pull tickets  
4 associated with cables when they were originally  
5 routed.

6 So you just run your computer and it tells  
7 you whether you've got separation or not. And if you  
8 don't, what circuits are offending circuits.

9 MR. FRUMKIN: Many plants have that. Or  
10 some plants have that.

11 MEMBER-AT-LARGE SIEBER: Some plants have  
12 it. Some plants had to do that all manually, hand  
13 over hand.

14 MR. FRUMKIN: But I just want to add one  
15 thing that the staff has come our with a statement --  
16 or, well, not really a statement but what 3(g)(ii)  
17 says is that when cables of the redundant trays are  
18 within the same fire area and are not protected, so if  
19 you have a area with train A equipment in it and no  
20 train B equipment or the train B is protected in  
21 accordance with 3(g)(iii) protection criteria, we're  
22 not -- so with the train B protected, we're not  
23 limiting the actions that -- the feasible and reliable  
24 actions for failures on train A.

25 So if you have a protected train outside

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1 of a fire area or protected with 3(g)(ii), the  
2 licensees can do feasible and reliable manual actions  
3 on the fire-effected train to let's say close that  
4 valve that opens spuriously or stop that pump that  
5 opens spuriously because there is a full -- typically  
6 from the control room, so there is good annunciation  
7 and indication, there is a full protected train  
8 outside of that fire-effected area.

9 And I'll just point to Alex and see if he  
10 nods at me. Okay, yes.

11 MEMBER-AT-LARGE SIEBER: And there is very  
12 limited amounts of equipment if you had a spurious  
13 actuation, would cause another accident like a LOCA.  
14 Some value opens in the valve is -- like a safety  
15 injection valve, is designed to pump in not pump out.

16 Okay, so there are check valves and things  
17 like that that would prevent that. But there area  
18 few cases -- PRVs for example --

19 MR. FRUMKIN: Yes, PRVs is one I was  
20 thinking of if you --

21 MEMBER-AT-LARGE SIEBER: Yes , that could  
22 open and --

23 CHAIRMAN WALLIS: New plant designs have  
24 this screw valves. And the spurious actuation of them  
25 create a LOCA.

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1 MEMBER-AT-LARGE SIEBER: Yes, but they  
2 have them so you get to a safer condition, right?

3 CHAIRMAN WALLIS: One question I was going  
4 to --

5 MEMBER-AT-LARGE SIEBER: It is just  
6 expensive to do it.

7 MEMBER DENNING: Yes, is there any kind of  
8 assessment as to what fraction of spurious actuations  
9 actually are deleterious as far as effecting safe  
10 shutdown capability? I mean has anybody in a risk  
11 study done that kind of an assessment? Or do you have  
12 any feeling as to the fraction of spurious actuations  
13 that will get you into trouble?

14 MR. FRUMKIN: Well, you asked for that.  
15 We have this bounding analysis that we did and you  
16 actually -- well, you have to look at a lot to find  
17 the ones that are going to give you problems from a  
18 spurious actuation standpoint. But in our bounding  
19 analysis, it took five pairs of spurious actuations in  
20 order to get a significant risk.

21 And it is because these spurious system --  
22 these multiple spurious effect systems that, you know,  
23 are the redundant train. So it effects both -- the  
24 train, the productive train or the unprotected train,  
25 and the redundant train so you really lose all your

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1 protection with these scenarios. And it doesn't --  
2 you have to look at a lot to find the bad players.  
3 And there don't actually have to be a lot of bad  
4 players, at least based on our bounding analysis for  
5 it to be of fairly high risk significance.

6 MEMBER DENNING: Continue please.

7 MR. WOLFGANG: Background since 1997,  
8 multiple LERs brought lack of consensus concerning  
9 circuits to the staff's attention. And this led to a  
10 moratorium on inspection of circuit issues back in  
11 1997.

12 In 2001, NEI/EPRI cable fire test  
13 demonstrated that multiple spurious actuations can  
14 occur. And they can occur in rapid succession or  
15 simultaneously without sufficient time for mitigation  
16 in between.

17 Therefore if a licensee doesn't account  
18 for multiple spurious actuations, and its circuits  
19 analysis, the licensee may not be in compliance with  
20 10 CFR 50.48 and 10 CFR Part 50, Appendix A, General  
21 Design Criteria, and (3) which require that a licensee  
22 provide and maintain free from fire damage, one train  
23 of systems necessary to achieve and maintain the safe  
24 shutdown.

25 Staff has developed the risk-informed

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1 approach to inspections to focus on risk-significant  
2 configurations based on the cable fire test. And this  
3 is RIS 2004-003.

4 MEMBER DENNING: Now let me ask with  
5 regard to that, I understand that that was prepared  
6 for inspection as opposed to compliance.

7 MR. WOLFGANG: Correct.

8 MEMBER DENNING: But is there a real  
9 reason why one couldn't use guidance of that type for  
10 compliance as well? Do you see a regulatory  
11 constraint that would prevent you from -- I mean from  
12 the regulations that exist now, do you think it would  
13 be incompatible for the staff to provide the  
14 equivalent, perhaps a perturbation off of that or  
15 perhaps a revision to NEI's risk-informed guidance?  
16 Why can't we do that?

17 MR. WOLFGANG: I think the thing is we  
18 haven't seen licensee's risk tools, their model that  
19 we would have to approve prior to them using any risk  
20 analysis.

21 MR. KLEIN: Let me take a shot at  
22 answering the question maybe at a higher level. And  
23 that is with respect to licensees who are required to  
24 meet the requirements of Appendix R. Don't today have  
25 the ability to change that regulation or the

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1 commitment to that regulation based upon risk  
2 information.

3 If they want to do that, they would have  
4 to seek an exemption request from us against the  
5 regulation. They may certainly use risk information if  
6 they want to come in and see us with an exemption  
7 request, that is certainly open to them.

8 But what I think Bob is indicating is that  
9 a licensee may not make a change in their plant using  
10 risk information and making the conclusion based upon  
11 their standard license condition that says that, you  
12 know, it doesn't effect their ability to achieve and  
13 maintain safe shutdown.

14 The staff has been telling licensees that  
15 we would like them to come in and see us for such an  
16 exemption request or a license amendment.

17 MEMBER DENNING: Yes, I understand that  
18 that is the way -- that is the process by which they  
19 would use risk information to do that. But this first  
20 bullet is generic. It is generic information as to  
21 how many combinations of things or what are kinds of  
22 situations that are -- could be expected to be risk  
23 significant?

24 Now I realize it is not totally complete  
25 but it, you know, it gave guidance to the inspectors

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1 as to what are the combinations of things that could  
2 risk significant to look at and make sure. And I  
3 don't see any reason why one couldn't effectively rule  
4 out some of this total space of situations that the  
5 applicant has to look at to be compliant.

6 Now, you know, Tom is saying -- and I  
7 think it is kind of the regulatory position that  
8 you've got to look at everything because anything that  
9 can prevent this safe shutdown pathway is a potential  
10 problem. But you used it for the inspector to give  
11 him guidance on what is risk important and not in the  
12 area.

13 Couldn't you have done the same to provide  
14 generic guidance on this is how far you have to go in  
15 this process of looking at multiple spurious  
16 actuations.

17 MR. FRUMKIN: Bob, let me -- I'll be  
18 candid. We tried very hard to read 3(g)(ii) as a --  
19 to be risk informed in the way you describe. And with  
20 help from our lawyers, we were unable to get there for  
21 those pre-`79 plants. And then there is also the  
22 Agency or the Commission has approved a risk-informed  
23 rule.

24 And although it is more comprehensive,  
25 that is out there. And we considered the possibility

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1 of a risk-informed changed to this rule, to the  
2 current 3(g)(ii), and there is currently a rule that  
3 has been promulgated by the Commission. So that did  
4 not seem like a credible approach.

5 CHAIRMAN WALLIS: Well, could I follow up  
6 on that? And I looked at this risk informed approach.  
7 It seems to be just advice on vendors --

8 MR. FRUMKIN: Yes?

9 CHAIRMAN WALLIS: -- to focus on certain  
10 configurations. Well, that's okay. Focus on what  
11 matters. But then how does this inspector decide to  
12 reach some sort of a finding that something is not  
13 adequate? Or is not in compliance. That would get  
14 closer to tying these things together because the  
15 whole question here is what do they have to do in  
16 order to be in compliance.

17 MR. FRUMKIN: That is correct.

18 CHAIRMAN WALLIS: And how does the  
19 inspector know when they are in compliance or not?  
20 Well, he has just chose to focus on these things. How  
21 does he then decide when he is focused whether or not  
22 they are in compliance?

23 MR. FRUMKIN: And the answer to that is  
24 they pull up the licensing basis and if the licensing  
25 basis, if they do not have -- are not licensed for

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1 single spurious, that are considered to be -- required  
2 to look for multiple spurious.

3 CHAIRMAN WALLIS: Well then what are they  
4 supposed to do?

5 MR. FRUMKIN: Then that would be -- that  
6 could be -- that would be a finding would be run  
7 through the risk analysis of this STP. It would be  
8 cited. And the licensee would have to resolve a  
9 finding in the normal manner.

10 MEMBER DENNING: Incidentally, I think  
11 your last statement about their legal interpretation  
12 of pre-`79 is very important as far as our  
13 considerations are concerned because I mean it could  
14 be indeed that we are in a box in terms of whether you  
15 can risk inform the current regulation or whether you  
16 would need to change a rule which is obviously a huge  
17 undertaking.

18 CHAIRMAN WALLIS: Well, I'm really  
19 wondering, you made an initial statement that we  
20 should have had a subcommittee meeting. We seem to be  
21 at the level of behaving like a subcommittee so trying  
22 to determine whether or not you are ready to go to the  
23 full Committee because there seems to be so many  
24 questions here. And yet we are here as a full  
25 Committee.

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1                   MEMBER DENNING: That is why we have three  
2 whole hours.

3                   CHAIRMAN WALLIS: You know subcommittees  
4 sometimes have the option of saying you guys aren't  
5 ready. You shouldn't go to the full Committee. But  
6 they are here.

7                   MEMBER DENNING: The full Committee has  
8 that same option, doesn't it?

9                   MR. WOLFGANG: To continue, in 2004, staff  
10 held a public meeting in Atlanta to discuss the staff  
11 positions and solicit stakeholder feedback. We worked  
12 with NEI to finalize an acceptable industry guidance  
13 document for circuit analysis. And that was NEI 0001.

14                   Staff issued RIS 2005-30 to clarify  
15 regulatory requirements for a circuit analysis. And  
16 that RIS addressed the terms associated circuits, any  
17 and all, and emergency control stations.

18                   And this draft generic letter was issued  
19 for public comment in October 2005. We held a public  
20 meeting in March of this year. And the pertinent  
21 public comments were incorporated into the final draft  
22 of the generic letter. And we also received CRGR  
23 approval to issue the generic letter.

24                   The basis for the generic letter -- the  
25 bulleted review of NRC regulations, generic

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1 communications, correspondence related to this issue.  
2 And we have references identified in the generic  
3 letter. The results of the 2001 NEI EPRI cable fire  
4 test program, prior to the cable fire test, there was  
5 very little information available regarding circuit  
6 failure during a fire which made enforcement of the  
7 regulations in this area difficult. And also input  
8 from inspectors on issues that needed to be addressed.

9 The issue clarified in the generic letter  
10 is multiple spurious actuations. As Dan said earlier,  
11 some licensees claim that only a single spurious  
12 actuation had to be assumed in their circuit analysis.  
13 This was based on a misinterpretation of Generic  
14 Letter 86-10 in response to question 5.3.10.

15 And also some licensees claimed multiple  
16 spurious actuation occur with sufficient time in  
17 between them to take mitigating actions.

18 CHAIRMAN WALLIS: Now this  
19 misinterpretation has been going on for how long?  
20 D.L. 86 is 9/86?

21 MR. WOLFGANG: Yes.

22 CHAIRMAN WALLIS: Over 20 years they have  
23 been under some misapprehension about the regulations?

24 MR. WOLFGANG: That is my understanding.

25 MR. FRUMKIN: In this section of the

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1 generic letter, it refers to the 3(g)(iii) associated  
2 circuits I believe. So it took 3(g)(iii) alternate  
3 shutdown -- I'm sorry -- it took this 3(g)(iii)  
4 assumption and applied it to 3(g)(ii) areas. And that  
5 is what this misinterpretation is describing.

6 MEMBER APOSTOLAKIS: Let me understand it  
7 a little bit the second bullet here. Suppose there is  
8 sufficient time between actuations? Okay, so you have  
9 the first one. You really don't know what the second  
10 one is going to be, right? It could be anything.

11 MR. WOLFGANG: Second.

12 MEMBER APOSTOLAKIS: Oh, let's say there  
13 are two --

14 MR. WOLFGANG: Actuations?

15 MEMBER APOSTOLAKIS: -- spurious -- yes.

16 MR. WOLFGANG: Yes, based on these tests,  
17 they could occur --

18 MEMBER APOSTOLAKIS: No, I understand  
19 that, that it is a very short time.

20 MR. WOLFGANG: Right.

21 MEMBER APOSTOLAKIS: But let's assume for  
22 a moment that there is sufficient time, there is long  
23 time between them.

24 MEMBER DENNING: And there may be, George.  
25 There is a contention that --

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1 MEMBER APOSTOLAKIS: Okay.

2 MEMBER DENNING: Yes, right.

3 MEMBER APOSTOLAKIS: But you still don't  
4 know what the second one is going to be.

5 MEMBER DENNING: Is going to be, right.

6 MEMBER APOSTOLAKIS: So you can really  
7 take mitigations actions without know what the second  
8 will be?

9 MEMBER DENNING: Well, now wait a second.  
10 If you have mitigated the first one --

11 MEMBER APOSTOLAKIS: Yes.

12 MEMBER DENNING: -- then it is as if you  
13 now just have one.

14 MEMBER APOSTOLAKIS: Oh, so now you are  
15 going to get together and wait.

16 MR. WOLFGANG: And when the second one  
17 occurs and you have time to mitigate that one.

18 MEMBER APOSTOLAKIS: And this is doable?  
19 I mean has anybody looked into the details of this?  
20 It comes back to this issue of open endedness. You  
21 really don't know what is going to happen next. So I  
22 don't understand this particular -- I mean have they  
23 submitted details, you know, if you have sufficient  
24 time, you will protect the plant?

25 MEMBER DENNING: You know what I think

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1 would help us is we had some better feeling as to how  
2 do they really mitigate these actuations?

3 MEMBER APOSTOLAKIS: Yes, exactly,  
4 exactly.

5 MEMBER DENNING: What is a typical -- and  
6 I know there are constraints on manual --

7 MR. WOLFGANG: Yes, in 3(g)(ii), they  
8 can't use manual actions.

9 MR. KLEIN: Licensees have commonly used  
10 operator manual actions to mitigate that spurious  
11 actuation. They may send an operator out in a plant  
12 to close a valve or some such action like that. And  
13 then they wait for the next actuation and they say,  
14 okay, I've got plenty of time available to have taken  
15 that first action. And now they wait for the second  
16 action. And when that occurs, they send the operator  
17 out.

18 So I think that second bullet there is to  
19 just simply indicate to the Committee that that is the  
20 claim that some licensees have made. That is not  
21 necessarily a position that the staff agrees with.

22 MEMBER APOSTOLAKIS: No, I understand  
23 that.

24 MR. WOLFGANG: Yes.

25 MEMBER APOSTOLAKIS: But I'm trying to

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1 understand the position.

2 MEMBER DENNING: Now suppose you had --  
3 suppose it takes 30 minutes to have them get out there  
4 and close the valve, now obviously -- more than, you  
5 know, and then something else happens say before he  
6 closes that valve, then the real question is there a  
7 compounding effect?

8 MR. WOLFGANG: And I guess like --

9 MEMBER DENNING: As far as you don't have  
10 enough operators that you can send out to do all these  
11 --

12 MEMBER APOSTOLAKIS: The real question is  
13 is the length of time the critical variable here. And  
14 it doesn't seem to me to be.

15 MR. FRUMKIN: I mean we'll give you an  
16 example, for example if you have a -- you going to  
17 drain two valves in series that would drain the RWST  
18 and you also damage a number of other equipment. They  
19 fail. They short out and become unavailable.

20 Well, if you have -- if you lose the  
21 indication on the RWST and you open up the valve and  
22 you say you have plenty of time to -- you have  
23 indication the valve opened spuriously, you can go  
24 down and close the valve and then when the next valve  
25 opens, it has no effect.

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1 I think that would be an example of where  
2 they feel they would have sufficient time. Let's say  
3 the circuits are in cable trays -- you know, 20, you  
4 know, six cable trays above. There is going to be a  
5 good deal of time before the first cable tray is  
6 damaged and the next -- the first cable is damaged and  
7 then the next cable.

8 So -- and from a risk standpoint, you  
9 might be able to argue yes, we will have adequate  
10 indication that the valve opened and we have adequate  
11 time. And then that could be a risk-informed type  
12 analysis.

13 But if they are in the same cable, then  
14 they both could open simultaneously.

15 MEMBER MAYNARD: If there is time and  
16 there are a number of things they can do, when you  
17 have a fire in an area, you typically know what cables  
18 and what other things could be potentially effected in  
19 that and the manual actions going out either manually  
20 isolating valves, pulling breakers, a number of things  
21 you can do. But it is based on what is in that area  
22 or what could be effected with those in that area.

23 MEMBER APOSTOLAKIS: I remember when I was  
24 reading the analysis of the Browns Ferry fire a long  
25 time ago. They did have spurious actuations there did

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1 they not?

2 MR. WOLFGANG: Yes.

3 MEMBER APOSTOLAKIS: Within 20 minutes I  
4 believe they had all sorts of signals and so on. And  
5 then things started going dead. How does that  
6 experience fit into this?

7 MR. FRUMKIN: I think that experience is  
8 "the long-held staff position" that multiple  
9 simultaneous spurious actuations occur. I think when  
10 you want to point your finger to where we come up with  
11 that, it comes from 1975. It comes from the very  
12 beginning of fire protection regulation is that these  
13 spurious actuations occur.

14 And I think that -- unfortunately the  
15 statements of consideration for Appendix R are short.  
16 You know we have, you know, dozens of pages for a  
17 short NFPA-805 and there may be a dozen pages and a  
18 page maximum for 3(g)(iii) -- for 3(g) of Appendix R.  
19 So we really can't go back in time and pull out the  
20 basis for that. But we have Mark Sallies here, he  
21 might be able to shed some light on that.

22 But I believe that that is the long-held  
23 staff position is the Appendix R fire and these  
24 multiple spurious and rapid succession starting pumps  
25 giving incorrect indication, doing all sorts of

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1 unpleasant things to the plant.

2 CHAIRMAN WALLIS: The incorrect indication  
3 is a big problem. Something has happened and yet you  
4 don't know quite what has happened. That is another  
5 variable altogether from the time. I mean it is the  
6 uncertainty of knowing what is going on which might  
7 lead the operator to do the wrong thing.

8 MEMBER-AT-LARGE SIEBER: Yes, on the other  
9 hand, indications usually either go full scale or to  
10 zero.

11 MEMBER MAYNARD: A lot of times you've got  
12 multiple indications. And that is something they are  
13 trained on quite a bit is on instrument failures.  
14 That said, it is not uncommon to have an instrument  
15 failure without a fire. So they are trained on how to  
16 handle that.

17 MR. FRUMKIN: Right. One of the failure  
18 though they can also get -- and, again, there's  
19 multiple indications, but they could get an indication  
20 of a pump starting when it didn't start. Or a pump in  
21 a start and stop position and then that's going to  
22 take time for them to troubleshoot and whether it was  
23 started or stopped could it be adversely effecting  
24 overfilling the plant or not.

25 There are a number of timing issues that

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1 I'm sure they are trained on. But they can be  
2 potentially challenging.

3 MEMBER DENNING: Continue.

4 MR. WOLFGANG: The NRC letter from Sam  
5 Collins to NEI in 1997 stated that multiple spurious  
6 actuations caused by fire-induced hot shorts must be  
7 considered and evaluated. As I stated earlier, Byron  
8 and Braidwood have SCRs approving the assumption of a  
9 single spurious actuation for a fire event. So if the  
10 staff position is applied to them, it would be  
11 considered compliance backfit.

12 The generic letter --

13 MEMBER-AT-LARGE SIEBER: That's a unique  
14 case, those two plants.

15 MR. WOLFGANG: Yes, correct. The generic  
16 --

17 MEMBER APOSTOLAKIS: But what does that  
18 mean now?

19 MR. WOLFGANG: They are in compliance by  
20 definition.

21 MEMBER APOSTOLAKIS: You would say the SCR  
22 was not correct or what?

23 MR. WOLFGANG: They are in compliance by  
24 definition, right.

25 MEMBER APOSTOLAKIS: But I don't

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1 understand this compliance backfit.

2 CHAIRMAN WALLIS: Compliance by mistake is  
3 what I heard earlier.

4 MR. WOLFGANG: Well, by regulatory  
5 approval.

6 MEMBER APOSTOLAKIS: Can you explain the  
7 parenthesis? If stop position is applied to them, it  
8 would be a compliance backfit. You mean the current  
9 position?

10 MR. WOLFGANG: If they comply with their  
11 SER, the SER is approved even though it was a mistake,  
12 it would be a compliance backfit if we made them  
13 change.

14 MEMBER APOSTOLAKIS: So you would have to  
15 admit then that the SER was not correct?

16 MR. WOLFGANG: We have already admitted  
17 that.

18 MEMBER APOSTOLAKIS: Okay.

19 MEMBER MAYNARD: It is a matter of what  
20 regulatory process is used to actually do it. A lot  
21 fo people think backfit is a bad thing. I think it is  
22 a process that should be used a little bit more rather  
23 than trying to go around a lot of these things. Just  
24 say hey look, we've changed or this is a new  
25 requirement. Here's the regulatory burden. Here is

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1 the increased safety benefit. We are imposing this as  
2 the new requirement for you. It's not necessarily a  
3 bad thing. Just what regulatory burden --

4 MEMBER APOSTOLAKIS: But this doesn't  
5 happen too often, right? I mean --

6 MEMBER DENNING: What? Regulatory  
7 mistakes?

8 MEMBER APOSTOLAKIS: Yes.

9 MEMBER DENNING: Right.

10 CHAIRMAN WALLIS: Well, this last bullet,  
11 I have a lot of problem with. And they must be  
12 considered and evaluated. But it seemed to be very  
13 unclear about to what depth and by what methods these  
14 things must be considered and evaluated. That seems  
15 to be so open-ended that the licensee must be  
16 uncertain what he has to do.

17 MEMBER DENNING: RIS provides more detail  
18 than the generic letter does, right. The 2005 RIS.

19 MR. WOLFGANG: 2005-30?

20 MEMBER DENNING: Yes.

21 MR. WOLFGANG: Not on multiple spurious  
22 actuations, no.

23 MEMBER DENNING: No?

24 MR. WOLFGANG: It doesn't address that.

25 We didn't put that in there because we thought

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1 multiple spurious actuations because of this Byron and  
2 Braidwood SCR could be considered possibly a change in  
3 staff position. So that's why we didn't want to put  
4 it in a RIS.

5 CHAIRMAN WALLIS: There is no regulatory  
6 guide that says how to evaluate multiple spurious  
7 actuations?

8 MR. KLEIN: I think if I could respond to  
9 that question, I'll ask Dan also to pipe in. Is on  
10 page 7 of the generic letter where we do talk about,  
11 you know, ways that licensees can bring themselves  
12 into compliance, there is a discussion in there about  
13 the deterministic methodology or NEI-0001.

14 We do talk about the guidance in there in  
15 Chapter 3. We do say that for post-fire safe-shutdown  
16 circuits in conjunction with the guidance provided in  
17 this generic letter that NEI-0001 is one of the  
18 acceptable approaches to achieve regulatory compliance  
19 with the fire protection requirements for multiple  
20 spurious actuations.

21 So that's one example. And Dan can  
22 correct me if I've overstated this.

23 MR. WOLFGANG: And we say in conjunction  
24 with the guidance provided in this generic letter to  
25 mean consider multiple spurious actuation. I believe

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1 NEI-0001 says to consider two spurious actuations.

2 CHAIRMAN WALLIS: That doesn't mean  
3 anything to me. It could simply mean to say well I  
4 considered it and I think it is irrelevant or  
5 something. I mean what does consider mean? But what  
6 depth? By what methods?

7 MEMBER APOSTOLAKIS: To the depth required  
8 to convince the staff.

9 MEMBER BONACA: That is called open ended.  
10 We could fix it here but it seems to me that, you  
11 know, we do have a problem. And we are trying to  
12 figure out what is the best regulatory process to  
13 solve it. But the problem is there.

14 CHAIRMAN WALLIS: Well, I think we agree  
15 there is a problem. It is just whether or not there  
16 is a mature enough process in place to make something  
17 that is workable happen.

18 MEMBER BONACA: I understand.

19 MEMBER-AT-LARGE SIEBER: Well, this work  
20 has already been done once. The only thing that  
21 changed is the disqualification of certain fire  
22 barriers. All the licensees have done this. And it  
23 should be part of their licensing basis. There should  
24 be plant records as to how they did it the first time.

25 MEMBER DENNING: Really, Jack? I mean

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1 isn't there an issue here of the number of licensees  
2 who thought that they were really dealing with one  
3 spurious actuation requirement? Or one at a time?

4 MEMBER-AT-LARGE SIEBER: I can only speak  
5 to one licensee or about one licensee. And that was  
6 not the assumption.

7 MEMBER DENNING: That was not your  
8 assumption.

9 MEMBER-AT-LARGE SIEBER: No.

10 MEMBER DENNING: No. But there are  
11 licensees out there --

12 MEMBER-AT-LARGE SIEBER: Otto, was that  
13 yours? It is sort of obvious from Browns Ferry that  
14 you get more than one.

15 MEMBER MAYNARD: I'm trying to recall  
16 because the only place where we had different trains  
17 mixing was in the control room so it was primarily a  
18 control room-related issue.

19 MEMBER KRESS: But that is one purpose of  
20 the generic letter to find out the status.

21 MEMBER-AT-LARGE SIEBER: The only time the  
22 number of faults becomes an issue is when you are  
23 trying to solve the problem with operator manual  
24 actions. So now you've got too many things for too  
25 few people to do.

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1           But if you have train separation and the  
2 train separation is effective, you are going to get  
3 some spurious actuations which are going to be  
4 upsetting but not fatal. And you are still going to  
5 maintain a full set of safety equipment that  
6 functions. And that is the object of the fire  
7 protection regulation.

8           MR. KLEIN: I would strongly agree with  
9 what Dr. Sieber just indicated in that the focus here  
10 is on 3(g)(ii) compliance and that is where you've got  
11 the redundant trains in the same fire area as Dan had  
12 indicated. And Dan had indicated some of the history  
13 that, you know, led us up to this.

14           And that had to do with the resolution  
15 that some licensees used to address the thermal lag  
16 issue where they removed some of these fire barriers  
17 and in lieu of meeting the separation requirements of  
18 3(g)(ii), elected to put in place the use of operator  
19 manual actions.

20           And I think that is a very important thing  
21 to kind of keep in mind.

22           MEMBER-AT-LARGE SIEBER: But other  
23 licensees pulled no cable.

24           MR. KLEIN: That is correct. I'm not --

25           MEMBER-AT-LARGE SIEBER: They moved

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1 circuits out of the same fire area.

2 MR. KLEIN: Yes, I'm not suggesting that  
3 all licensees implemented unapproved operator manual  
4 actions in lieu of the requirements of 3(g)(ii).

5 There are other licensees who did plant modifications,  
6 did re-analysis, did re-wraps, pulled cables, what  
7 have you to bring themselves back into compliance with  
8 3(g)(ii).

9 MEMBER-AT-LARGE SIEBER: And some of them  
10 didn't use thermal lag to begin with.

11 MR. KLEIN: That is correct.

12 CHAIRMAN WALLIS: Well, I don't really  
13 have a good understanding of what kind of spurious  
14 actions we are talking about, what kind of operator  
15 actions in response we're talking about, and whether  
16 redundant trains solve the spurious action problem.

17 If I have a fire scenario and it switches  
18 on my high pressure injection, I've got a pump that  
19 runs and it is pouring water into the system, right?  
20 For one thing, I have to know -- I have to diagnose  
21 what is happening. Do I have to send somebody  
22 somewhere to shut a valve? And does that factor have  
23 some redundant train help me at all when something has  
24 been activated spuriously? I mean it is not clear to  
25 me what the range of kind of scenarios is that you are

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1 talking about here.

2 And whether redundant trains always help  
3 you or don't. Maybe they don't help you at all  
4 sometimes. And maybe the operator action sometimes is  
5 so severe that it is very difficult to take.

6 MEMBER MAYNARD: I think in most cases,  
7 there are things they can do. But there are some --  
8 and I think the power operator relief valve is one  
9 that if you have a system where you can't operate the  
10 block valve or the PRE, if it opens you basically have  
11 given yourself a small break.

12 CHAIRMAN WALLIS: That's what I think.  
13 When you think about TMR, they had a false indication  
14 because there was a light which said it was closed  
15 when it was open.

16 MEMBER MAYNARD: But most times you are  
17 still covered by -- I mean you are still analyzed for  
18 a small break LOCA or for the other events. A pump  
19 coming on, there are multiple ways to turn pumps off.  
20 And you are not going to be injecting water at such a  
21 rate that you have, you know -- I'm kind of talking  
22 more PWR than I am BWN here so I --

23 MEMBER DENNING: But it is those things  
24 though -- it is the multiplicity of those things that  
25 boggles my mind. You know rather than train

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1 separation and train protection which you talked  
2 about, it just seems like there is such a multiplicity  
3 of potential things and trying to analyze all those  
4 things seems almost open ended.

5 MEMBER-AT-LARGE SIEBER: There aren't --  
6 in sheer numbers, there aren't all that many safety  
7 circuits. And if you go underneath the control room  
8 into the faucet rafter, you'll find loads of jumpers  
9 and knife switches and things like that where you can  
10 de-energize control circuits.

11 Now one of the problems is that it  
12 actually, in a lot of circuit breakers, it takes power  
13 to trip it, you know. The trip coil requires  
14 energization so pulling a knife switch doesn't  
15 guarantee that it will run forever. And so the  
16 operator really has to understand how the control  
17 system is set up to be able to do that.

18 But there are ways to overcome these  
19 problems that don't require excursions all over the  
20 plant. And on the other hand, the plant is designed  
21 to be safe provided that you have a functional safety  
22 train. Separation criteria, if rigidly applied,  
23 provides that independent safety train.

24 MEMBER DENNING: We are going to now take  
25 our break until 20 after 10. And then we will have to

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1 move surprisingly quickly after that.

2 CHAIRMAN WALLIS: Okay. So we're going to  
3 take a break until 20 past 10.

4 (Whereupon, the foregoing matter went off  
5 the record at 10:09 a.m. and went back on the record  
6 at 10:23 a.m.)

7 CHAIRMAN WALLIS: Rich, would you resume  
8 the management of the meeting, please?

9 MEMBER DENNING: Please proceed.

10 MR. WOLFGANG: Okay. The last issue,  
11 clarifying the generic letter, the point we have here  
12 is the staff position on multiple spurious actuations  
13 presented in the generic letter is consistent with  
14 section 9.5.1 of the standard review plan.

15 Public comments. The significant public  
16 comment was that the generic letter constituted a  
17 backfit to licensees. And we addressed this comment.  
18 We obtained CRGR approval to issue this generic  
19 letter. And, as I said earlier, only for Byron and  
20 Braidwood, who have approved SERs that we know of,  
21 would this constitute a backfit.

22 Basically, this generic letter is just a  
23 request for information.

24 MEMBER MAYNARD: I would challenge that.

25 MR. WOLFGANG: Yes. I think --

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1                   MEMBER MAYNARD: That's all right. We'll  
2 comment on that.

3                   CHAIRMAN WALLIS: It isn't just a request  
4 for information. It asks them to do a lot of things.

5                   MEMBER MAYNARD: Yes. That is what I  
6 challenge, that statement. Yes. We've talked about  
7 it.

8                   CHAIRMAN WALLIS: That was what I was  
9 uncertain about.

10                  MEMBER DENNING: Why don't you go ahead  
11 and summarize, even though we're going to have a  
12 couple of other things? Why don't you go ahead and  
13 summarize? Then there are a couple of other things we  
14 would like you to -- we have more than started. We're  
15 almost done.

16                  MR. WOLFGANG: A summary. The generic  
17 letter, as I said before, is a request for information  
18 from licensees. The industry cable fire test program  
19 reaffirmed the staff interpretation of the regulatory  
20 requirements concerning multiple spurious actuations  
21 must be considered in the circuits analysis. The  
22 generic letter is necessary to ensure that all  
23 risk-significant circuit situations are identified and  
24 addressed.

25                  CHAIRMAN WALLIS: Could you go back a bit

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1 and say something about why this came about? I mean,  
2 wasn't this something to do with this thermal lag  
3 business? All of these installations, like Hemmicks  
4 and Eastern, every time we look at them --

5 MR. WOLFGANG: Yes.

6 CHAIRMAN WALLIS: Well, isn't that the  
7 solution would be to have a proper barrier around  
8 these things?

9 MR. WOLFGANG: That's one solution, yes.

10 MEMBER DENNING: I don't see that as a  
11 total solution. I don't --

12 MR. WOLFGANG: That is one solution.  
13 Another solution is a separation, 20-foot separation.

14 CHAIRMAN WALLIS: But in the past, when we  
15 believed that this thermal lag worked, there wasn't a  
16 problem. Is that right?

17 MEMBER MAYNARD: No. I think the problem  
18 was still there then. This has been bounced around  
19 since I know at least the early '80s as an issue. I  
20 think the thermal lag, it helped in some cases where  
21 you could show separation in the trains, but it  
22 doesn't necessarily take care of you if you've got  
23 cables in the same area that are --

24 MEMBER DENNING: Right. They can still  
25 give you spurious actuation, regardless.

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1 MEMBER MAYNARD: Right.

2 MEMBER DENNING: Now, it may be -- do you  
3 have any comments on that?

4 MR. FRUMKIN: Yes. If you have the  
5 separation, you can still get spurious actuations.  
6 And that's a box that we're not in with the rule. The  
7 rule does not require that those be protected. So all  
8 plants have the flexibility for the unprotected train  
9 to mitigate through feasible and reliable manual  
10 actions those types of spurious actuations.

11 Now, if you were to get a spurious  
12 actuation that were to give you all incorrect  
13 indication and was not recoverable, then that would  
14 still have to be resolved because it would be a  
15 potential safety issue. But for the minor ones that  
16 we have been talking about that would be fairly easy  
17 to resolve through a manual operator action or there  
18 are procedural controls or something of that nature,  
19 that would not be a compliance issue per se.

20 MEMBER DENNING: Help me with that because  
21 I still don't quite understand it. So if you have a  
22 protected train and you get a spurious actuation from  
23 an unprotected train, then you have to analyze all  
24 combinations of spurious actuations still, don't you,  
25 that are possible in that unprotected train?

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1 MR. FRUMKIN: Alex, do you want to?

2 MR. KLEIN: Yes, I believe you do because  
3 the over-arching requirement of appendix R is to be  
4 able to safely bring your plant to safe shutdown. And  
5 if you don't know what's occurring in your plant, then  
6 you can't meet that over-arching high-level goal of  
7 achieving and maintaining safe shutdown of your plant.

8 MR. FRUMKIN: And I will just say that  
9 once you have your protective train, your protected  
10 train, your unprotected train has a very limited set  
11 of things that could hurt you.

12 Now, we're talking we have plenty of  
13 water. We have plenty of indication. We have plenty  
14 of everything. But now we might open, we might cause  
15 a drain letdown path to open or we might cause a pump  
16 to start, but we should be getting clear indication of  
17 that in the control room. And in the normal  
18 procedure, process, you'll be getting indication of  
19 these things happening. And they should be able to  
20 mitigate them fairly effectively.

21 Now, there may be some things that would  
22 be difficult to mitigate. And, as Alex says, they  
23 have to find those and find a way to mitigate them.

24 MEMBER DENNING: So you have lots of  
25 things you have to analyze, but the mitigation of it

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1 is probably not too severe for the plant, and the  
2 plant is allowed to do manual action on it.

3 Now, there is another set here. So what  
4 is the other set? Aren't you always required to have  
5 a protected train?

6 MR. FRUMKIN: Yes. And these plants don't  
7 have that protected train. In effect, all circuit and  
8 manual action findings or potential violations are  
9 lack of protection, lack of circuit protection.

10 MEMBER DENNING: Circuit separation.

11 MR. FRUMKIN: So when --

12 MEMBER DENNING: Separation of the --

13 MR. FRUMKIN: Right. So when a finding  
14 comes in, let's say we have that hypothetical finding,  
15 which opens up and drains down the RWST. The citation  
16 is going to be against 3G2, lack of separation and  
17 lack of protection.

18 Now, we don't require one protection  
19 method over another, but they didn't put a protection  
20 method in there to protect the -- well, RWST is a bad  
21 example because it is not a necessarily one-train  
22 system.

23 But let's say you have both trains being  
24 affected by a fire. And here this is probably what is  
25 the more likely scenario. One train is just going to

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1 be damaged by the fire and not work, and then the  
2 other train is going to have the spurious actuation.

3 We don't necessarily need both trains to  
4 have spurious actuations. So that's the situation.  
5 It doesn't have to be multiple spurious on multiple  
6 trains.

7 MEMBER APOSTOLAKIS: Have we agreed that  
8 the first bullet is not quite correct? We're asking  
9 for more than just information?

10 MR. FRUMKIN: It's clear.

11 MEMBER APOSTOLAKIS: Yes.

12 MEMBER DENNING: It just takes them a lot  
13 of work to do it. I think we all recognize that it's  
14 a request for information, but in order to produce  
15 that information, you have to do a lot of work.

16 MEMBER APOSTOLAKIS: Right. It sounds to  
17 me like the priest saying, you know, "I know you're a  
18 sinner, George. Now, you go away and think of all the  
19 ways in which you could be a sinner and come back and  
20 tell me what they are." I have thought about it.

21 CHAIRMAN WALLIS: It's already been  
22 analyzed.

23 MEMBER APOSTOLAKIS: I protected myself.

24 MEMBER DENNING: Let's go on. And I would  
25 like to hear the conservative risk analysis. And so

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1 would you give us a little presentation on the  
2 conservative risk analysis?

3 MR. FRUMKIN: Are you done with all of  
4 your slides?

5 MEMBER DENNING: Yes.

6 MR. WOLFGANG: Yes. I just want to say  
7 one thing. If we don't issue a generic letter, we'll  
8 have to use the inspection process behind these  
9 problems.

10 It will take longer. We estimate three  
11 triennials, nine years. And some risk-significant  
12 items may be missed. We don't know because the burden  
13 is put on us, instead of the licensee. I just want to  
14 bring it up.

15 MEMBER DENNING: Thank you.

16 MEMBER BONACA: Is it with regard to the  
17 90 days with the responses? I mean, how did you come  
18 up with the 90 days, recognizing that you have to go  
19 to award to provide these responses? Was there an  
20 evaluation that you performed?

21 MR. WOLFGANG: No.

22 MEMBER BONACA: I mean, can it be changed?

23 MR. WOLFGANG: It can be changed. It was  
24 an arbitrary period that we thought was --

25 MEMBER APOSTOLAKIS: Or you can reduce the

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1 requirement.

2 MR. WOLFGANG: Yes, or we can --

3 MEMBER APOSTOLAKIS: So we don't have  
4 these?

5 MR. FRUMKIN: No, you don't have these  
6 slides. We will be making them available.

7 MR. KLEIN: Just as a reminder, if I can  
8 just follow up on the 90-day issue and the comments in  
9 regard to that, we do have a bullet in there that, for  
10 licensees who can't meet that 90-day requirement, that  
11 within the 30 days, they come in and request an  
12 extension.

13 MEMBER MAYNARD: Yes. And I saw that in  
14 the generic letter. If it's a situation where you  
15 know 90 percent of the industry is not going to be  
16 able to do it, you might as well be able to pick a  
17 date where everybody is not having to do it. I'll be  
18 interested in hearing from the industry as to whether  
19 they think that is a burden or not. I think I am  
20 assuming it is, but it may not be. So I don't know.

21 MR. FRUMKIN: This is a bounding risk  
22 analysis for multiple spurious actuations. It was  
23 developed for this meeting by Ray Gallucci, Dr. Ray  
24 Gallucci, who is in the Fire Protection Section. And  
25 it's been presented as a paper for the American

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1 Nuclear Society presentation. I think this winter  
2 they're having a meeting.

3 I am the third string presenter of this  
4 document. Ray is the first string. Dr. Weerakkody is  
5 the second string. And I'm presenting out of  
6 necessity.

7 MEMBER DENNING: Is Ray here to get beaten  
8 upon if he --

9 MR. FRUMKIN: No. Ray is on inspection at  
10 Browns Ferry. So we have --

11 MEMBER APOSTOLAKIS: Last time he was here  
12 he --

13 MEMBER DENNING: No wonder he's at Browns  
14 Ferry.

15 MR. KLEIN: Let me clarify. He's on a  
16 program review at Browns Ferry. He's not on an  
17 inspection.

18 MR. FRUMKIN: Okay. I'm sorry. These  
19 slides will be made available. My understanding of  
20 this analysis is using an older plant PRA that Ray was  
21 involved in, he pulled out some of the important  
22 measures for some hot shorts. And he recombined them  
23 into multiple hot shots and, using a simplification  
24 process, determined a bounding risk analysis for those  
25 based on those important measures for one plant's PSA.

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1           So this is the typical older nuclear power  
2 plant, has a fire CDF of  $3.3^{-5}$ . And they used a hot  
3 short probability of .1. They had modeled 24 of the  
4 basic events. And that contributed about 5 percent to  
5 the fire CDF or  $1.8D^{-6}$ .

6           And then there were some systematically  
7 symmetric redundant train components that were chosen  
8 because I think they had more of a larger impact on  
9 the plant risk if they were to fail together. And  
10 that was a contribution of .03 to the fire CDF, those  
11 10 items.

12           MEMBER DENNING: Let's go slowly so we --

13           MEMBER APOSTOLAKIS: Yes.

14           MEMBER DENNING: -- understand what we  
15 have here.

16           MR. FRUMKIN: Okay.

17           MEMBER APOSTOLAKIS: Twenty-four hot short  
18 basic events above truncation. What does that mean?

19           MR. FRUMKIN: That in the model, the ones  
20 that had remained as important remained having  
21 importance measures in the model, that there were only  
22 24 hot shorts that remained there.

23           MEMBER APOSTOLAKIS: The core damage  
24 frequency due to hot shorts is  $1.8 \cdot 10^{-6}$  per year, it  
25 says.

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1 MR. FRUMKIN: Correct, assuming a hot  
2 short probability of .1.

3 MEMBER APOSTOLAKIS: Which was low.

4 MR. FRUMKIN: Which is low based on  
5 current data.

6 MEMBER KRESS: Okay. So one, it would be  
7 1.8 times  $10^{-5}$ .

8 MR. FRUMKIN: If you said 1.0, correct.

9 MEMBER DENNING: Now, you said that that's  
10 low, but don't forget here that now we're talking  
11 supposedly real nuclear power plants with fires where  
12 you would take into account the fact that the fire may  
13 not damage any cables, you know.

14 MR. FRUMKIN: Right. Well, this is from  
15 an --

16 MEMBER DENNING: Oh, this is --

17 MR. FRUMKIN: -- old fire PSA. So this  
18 does consider --

19 MEMBER DENNING: Yes, it does.

20 MR. FRUMKIN: -- many of those factors.

21 MEMBER DENNING: But saying that the  
22 probability of your hot short is .1 and saying, "Well,  
23 that is low," I think because we saw those other  
24 things where people say, "Well, it could be .6 or .2  
25 or something like that," --

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1 MR. FRUMKIN: Right.

2 MEMBER DENNING: -- and, therefore, this  
3 is low, that doesn't necessarily follow.

4 MR. FRUMKIN: I think this is the  
5 conditional hot short probability based on cable  
6 damage.

7 CHAIRMAN WALLIS: How about multiple  
8 shorts come into this?

9 MR. FRUMKIN: That is what we are going to  
10 be talking about.

11 CHAIRMAN WALLIS: This doesn't address  
12 that?

13 MR. FRUMKIN: No, no. Right. This is  
14 what this analysis is. So assuming that the  
15 components within each pair -- these are those ten  
16 items that have been paired -- have similar failure  
17 characteristics and locations, including their cable  
18 runs, again, this is a conservative assumption and  
19 that these comprise the full set of candidates for  
20 multiple spurious actuations that are not specifically  
21 modeled in the traditional IPEEEs as --

22 MEMBER APOSTOLAKIS: The number you showed  
23 us earlier assumes that these happen independently?

24 MR. FRUMKIN: Yes.

25 MEMBER DENNING: You know, I still don't

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1 understand the pairing. What is going on here? Is it  
2 ten corresponding to --

3 MEMBER APOSTOLAKIS: Ten of these?

4 MEMBER DENNING: Five paired components.

5 That means that there is a --

6 MEMBER APOSTOLAKIS: Redundant elements.

7 MEMBER DENNING: They're redundant

8 elements.

9 MEMBER APOSTOLAKIS: Yes.

10 MR. FRUMKIN: I believe what they did is  
11 of these 24, they took out 10 of them that could when  
12 combined have an issue.

13 MEMBER APOSTOLAKIS: They are still

14 located in the --

15 MEMBER DENNING: It could lead to

16 problems.

17 MR. FRUMKIN: On this slide, they're

18 independent.

19 MEMBER APOSTOLAKIS: Yes.

20 MR. FRUMKIN: But I think what we're going

21 to do is we're going to try to take out that and look

22 at them as pairs. So this is what we're going to do,

23 form a bounding analysis to estimate the potential

24 maximum CDF due to multiple spurious actuations for

25 this typical older MPP, which I think is what the

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1 target, the goal is here.

2 And now we start getting into some  
3 formulas. Per pair, one hot short corresponds to  
4 train A and the other to train B. So that's how they  
5 were paired. And they appear in symmetrically paired  
6 cut sets.

7 So one cut set, the CDF of A -- and  
8 there's the formula for that -- and the CDF of B,  
9 which is the fire initiator, and then the hot short or  
10 random failure of one of the paired components and  
11 then the summation of the B. Okay?

12 CHAIRMAN WALLIS: And where do the  
13 multiple shorts come in?

14 MR. FRUMKIN: This is the formula for --

15 CHAIRMAN WALLIS: It's between two trains,  
16 but it's not multiple shorts in the same cable.

17 MR. FRUMKIN: That's correct, not in the  
18 same cable.

19 CHAIRMAN WALLIS: It's still independent.  
20 And this formula that you have here, the cut sets, are  
21 still assuming that the --

22 MR. FRUMKIN: I think so. They're not  
23 going to be independent of the same fire and the same  
24 damage time, but they're going to be independent  
25 failures affected by the same fire.

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1 MEMBER APOSTOLAKIS: Conditional on the  
2 fire.

3 MR. FRUMKIN: Conditional on the fire.

4 MEMBER SIEBER: Which assumes the fire  
5 covers both things.

6 MR. FRUMKIN: Right, which is a  
7 conservative assumption in this analysis.

8 MEMBER SIEBER: Truly conservative.

9 MR. FRUMKIN: Yes.

10 MEMBER SIEBER: Improbable.

11 MR. FRUMKIN: Well, it depends on the  
12 design of the plant, but yes, it's --

13 MEMBER APOSTOLAKIS: So if I want to  
14 couple them, then, I will assume that Fa and Fb are  
15 just F, one fire. Is that correct? And then I will  
16 have --

17 MEMBER DENNING: A is --

18 MEMBER APOSTOLAKIS: Otherwise they are  
19 still independent. I mean, the fire initiator must be  
20 the same.

21 MR. FRUMKIN: Well, let's just hope that  
22 your answer --

23 MEMBER APOSTOLAKIS: We assume two  
24 different fires.

25 MEMBER DENNING: We'll go to the next

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1 slide. And maybe it will become clear.

2 MEMBER SIEBER: It's a lot clearer in  
3 here.

4 MR. FRUMKIN: Okay. So, again, we have --

5 MEMBER APOSTOLAKIS: This .1 comes from?

6 MR. FRUMKIN: The .1 was the  
7 state-of-the-art when they did this PSA of --

8 MEMBER APOSTOLAKIS: I'll tell you where  
9 it comes from.

10 MR. FRUMKIN: Okay.

11 MEMBER APOSTOLAKIS: That's 20 years or so  
12 ago.

13 MEMBER DENNING: You're responsible for  
14 .1?

15 MEMBER APOSTOLAKIS: I saw it, and I said,  
16 "Well, gee. How did you come up with that?"

17 So they said, "Well, call this guy"  
18 somewhere in California.

19 I called this guy. He says, "Well, you  
20 know Sandia told us that."

21 "What Sandia?"

22 "This person."

23 So I called this person in Sandia. He  
24 says, "Well, I really don't know. It's this other  
25 guy."

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1                   So I called this other guy. And he says,  
2 "You told us that."

3                   (Laughter.)

4                   MEMBER DENNING: So we're going to accept  
5 the .1.

6                   MEMBER APOSTOLAKIS: It wasn't followed up  
7 at all. I mean, that was the funniest thing.

8                   MR. FRUMKIN: The IPEEE assumed this hot  
9 short probability of .1. And then I believe we're  
10 doing a simplification of these factors here. And it  
11 actually gets very simple on the next slide, but if  
12 anyone really wants me to read through this, I can  
13 try.

14                   MEMBER DENNING: You know what we'll do?  
15 Let's go to the bottom line.

16                   MR. FRUMKIN: The bottom line.

17                   MEMBER DENNING: And we'll have copies of  
18 this.

19                   MR. FRUMKIN: Okay. Yes.

20                   MEMBER DENNING: And we'll --

21                   MR. FRUMKIN: Okay. This is, I believe --  
22 well, let's see.

23                   MEMBER APOSTOLAKIS: No. This is --

24                   MR. FRUMKIN: This is the bottom line  
25 here.

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1 MEMBER APOSTOLAKIS: Go back a little bit.

2 MR. FRUMKIN: I think --

3 MEMBER APOSTOLAKIS: This Fa plus Fb I  
4 don't understand. I thought it was going to be 1.5.

5 CHAIRMAN WALLIS: That's two fires, isn't  
6 it?

7 MEMBER APOSTOLAKIS: This is one or the  
8 other, yes, one or the other.

9 MR. FRUMKIN: Yes.

10 MEMBER APOSTOLAKIS: It doesn't really --  
11 I mean, he should have assumed one fire as far as I  
12 can tell. But, again, the --

13 MEMBER DENNING: We will look at it  
14 carefully.

15 MEMBER APOSTOLAKIS: -- connection is  
16 nothing, I mean, right?

17 MEMBER DENNING: We will look at it  
18 carefully later.

19 MR. FRUMKIN: Right. That would be a  
20 small difference.

21 MEMBER DENNING: And Ray's bottom line  
22 again is?

23 MR. FRUMKIN: Okay. Well, what he does  
24 here is he's taking out the  $1.1E^{-6}$ . And he's putting  
25 in this value or coming up with this value of .011,

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1 which is his surrogate simplification for all of the  
2 fires and his X factor, which is his fire and his  
3 failure factor.

4 MEMBER APOSTOLAKIS: He's bounding the  
5 random failures, right, by assuming a  $10^{-3}$ , right?

6 MR. FRUMKIN: I believe so.

7 MEMBER APOSTOLAKIS: Yes.

8 MR. FRUMKIN: Typical, right.

9 MEMBER APOSTOLAKIS: But he doesn't know  
10 how many -- oh, this is a bound on all random failures  
11 that are required.

12 MR. FRUMKIN: Yes.

13 MEMBER DENNING: Continue. Let's see.

14 MR. FRUMKIN: Okay. And now he's talking  
15 about the dual failures. Any of the ten paired hot  
16 shorts would appear in the cut sets. And  $F_a$  is the S,  
17 which is your severity factor, which going to reduce  
18 your likelihood of more hot shorts, which is the  
19 likelihood of having a big fire that's going to cause  
20 this damage.

21 CHAIRMAN WALLIS: Which affects both  
22 trains?

23 MR. FRUMKIN: Right. And then your  
24 various factors, A hot, B hot short, and then your  
25 random factors.

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1 MEMBER APOSTOLAKIS: Why square? Why A  
2 hot times A hot? It still assumes that they're  
3 independent events, right?

4 CHAIRMAN WALLIS: Well, that is the A hot  
5 times B hot --

6 MEMBER DENNING: It is going to take us  
7 some time to really work through this. Rather than do  
8 this here, --

9 MR. FRUMKIN: Okay.

10 MEMBER DENNING: -- let's go see Ray's  
11 bottom line.

12 MR. FRUMKIN: Okay. The bottom line is  
13 here.

14 MEMBER APOSTOLAKIS: All right.

15 MR. FRUMKIN: So for his choice of fires,  
16 for severity factor, I think he used a .1 for this  
17 extreme fire, which is an S.

18 CHAIRMAN WALLIS: Why is .1 extreme? It  
19 could be .5.

20 MR. FRUMKIN: Oh, no, no, no. This is for  
21 the likelihood of a large fire.

22 CHAIRMAN WALLIS: Yes. But just asking  
23 George Apostolakis by telephone tag --

24 MR. FRUMKIN: Oh, no. This is not his .1.

25 CHAIRMAN WALLIS: I thought it was his .1.

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1 MR. FRUMKIN: It's somebody else's .1.

2 MEMBER APOSTOLAKIS: This is from one of  
3 my students.

4 MR. FRUMKIN: That's right. Right. This  
5 .1 is from very likely the fire protection STP, which  
6 says that severe fires happen or ten percent of all  
7 fires that happen are severe, which is, again, a  
8 conservative number based on the state-of-the-art,  
9 which is the 6850 analysis.

10 But that's what we're doing with -- I  
11 mean, this is no question about it. This is a  
12 bounding analysis.

13 CHAIRMAN WALLIS: The ones that cause hot  
14 shorts?

15 MR. FRUMKIN: No. Instead of using a  
16 severity factor of one, assuming that all fires will  
17 cause the damage, we're only assuming that ten percent  
18 of the fires will cause the damage to cause hot short.  
19 So there are many different ways of severity --

20 MEMBER APOSTOLAKIS: So this .011, .011,  
21 is the frequency of fire or, no, this is from the  
22 random failure?

23 MR. FRUMKIN: Right.

24 MEMBER APOSTOLAKIS: According to one is  
25 one?

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1 MR. FRUMKIN: That's the severity factor.

2 MEMBER APOSTOLAKIS: What is the frequency  
3 of fire?

4 MR. FRUMKIN: What I believe he has done  
5 is I believe he has back-calculated through his  
6 simplification that .1 that he used. And he's turned  
7 that, the whole -- all of his important measures into  
8 this .011.

9 MEMBER APOSTOLAKIS: So that includes the  
10 frequency of fire?

11 MR. FRUMKIN: I believe so.

12 MEMBER APOSTOLAKIS: That's a pretty high  
13 number.

14 MR. FRUMKIN: Yes.

15 MEMBER DENNING: We are going to look at  
16 this carefully, but his bottom line is saying, well,  
17 what this could do in this particular case is it could  
18 have increased by a factor of three the fire damage  
19 frequency.

20 MR. FRUMKIN: I think what he's trying to  
21 say here is that when he back-calculates from his  
22 importance measures and then he combines these pairs,  
23 that -- and this is the bottom line here -- he can  
24 have a maximum of  $10^{-4}$  per year due to these pairs of  
25 hot shorts.

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1 MEMBER DENNING: And without it, they had  
2 3 times  $10^{-5}$  is what this plant did.

3 MR. FRUMKIN: Yes. That's the whole fire  
4 risk for the plant, is 3 times  $10^{-5}$ . So this could be  
5 dominating.

6 MEMBER APOSTOLAKIS: But why couldn't you  
7 go to an actual PRA and fix, instead of whatever they  
8 had, and see what happens, rather than doing this  
9 undue analysis? I mean, there are detailed fire PRAs  
10 out there.

11 MR. FRUMKIN: We don't actually have one  
12 in the office. He did have this information available  
13 to him.

14 MEMBER DENNING: What I would like to do  
15 is we would definitely like copies. Don't go  
16 anywhere.

17 MR. FRUMKIN: Okay.

18 MEMBER DENNING: And I don't think you  
19 have to read that. What we would like -- I mean, you  
20 can actually --

21 MR. FRUMKIN: Well, here his last slide is  
22 at least for a typical older nuclear power plant, one  
23 cannot a priori dismiss multiple hot shorts of being  
24 of lower significance.

25 MEMBER DENNING: Okay.

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1 MEMBER APOSTOLAKIS: Well, I would like to  
2 see the paper, please. No, no. Give me a copy.

3 MEMBER DENNING: Right. Yes, if we may.  
4 What we would like to do now is we would like to hear  
5 now from NEI, if we could. Don't run away, Research.

6 MEMBER APOSTOLAKIS: Don't anybody go  
7 away.

8 MEMBER DENNING: Don't anybody leave town  
9 other than me, but I would definitely like to make  
10 sure we have plenty of time to hear from NEI.

11 MEMBER APOSTOLAKIS: That's what I call  
12 running and meeting with --

13 MEMBER DENNING: The policeman is asked to  
14 lock the doors.

15 MEMBER APOSTOLAKIS: We have a cop  
16 outside?

17 MEMBER DENNING: And, Alex, you don't have  
18 handouts, but we can make them. Is that a true  
19 statement?

20 MR. MARRION: No, I do not have handouts.  
21 I do have a couple of comments.

22 MEMBER DENNING: You have comments?

23 MR. MARRION: Yes.

24 MEMBER DENNING: But you don't have any  
25 papers?

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1 MR. MARRION: No.

2 MEMBER DENNING: Okay. Please proceed.

3 MR. MARRION: Good morning. My name is  
4 Alex Marrion. I am a Senior Director of Engineering  
5 at NEI, and I appreciate the opportunity to offer a  
6 couple of comments on our perspectives on what we  
7 heard this morning.

8 Before I begin, I want to point out that  
9 we have two utility representatives, one from Progress  
10 Energy and one from Duke Power, who represent the two  
11 pilot plants for the application of NFPA 805.

12 And if the Committee so desires, I think  
13 it may be useful for you to understand the  
14 implications of this generic letter on the NFPA 805  
15 risk-informed application process. And I'll defer to  
16 you to --

17 MEMBER DENNING: We so desire.

18 MR. MARRION: Okay. Very good. Now I'll  
19 ask them to step up when I finish my comments.

20 To get back to Dr. Apostolakis' --  
21 George's comment, --

22 (Laughter.)

23 MR. MARRION: -- the test protocol and the  
24 issue of having cables exposed in the flaming region,  
25 I don't have any direct knowledge of that discussion

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1 with the NRC staff at the time we developed the test  
2 protocol. This was the first I heard of it, but I'll  
3 look into it. And we'll try to get an answer to you  
4 at the end of the week.

5 I do want to make it clear that we believe  
6 the multiple spurious actuation is a new regulatory  
7 position that results in significant impact on utility  
8 licensees, not only on the Appendix R, the NUREG 0800  
9 plants but also on the NFPA 805 plants.

10 The impact is significant in that it  
11 changes the methodologies that the utilities have  
12 credited in their licensing basis over the last 20  
13 years. So the licensing basis has to change.

14 Now, with that, it's perfectly appropriate  
15 for the NRC to say, "There's new information that has  
16 been brought to bear on this topic. And we have a new  
17 position." That's fine. But the NRC must bear the  
18 burden of demonstrating the safety impact of that new  
19 position and do a regulatory analysis to substantiate  
20 it because of the significant implications on the  
21 utility licensee design basis.

22 That's straightforward, but one thing that  
23 this position does not take into account is the  
24 fundamental elements of defense-in-depth relative to  
25 fire protection. What I'm talking about is the

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1 actions that are taken by licensees in preventing  
2 fires from occurring and detecting a fire when it does  
3 occur, having systems and personnel to respond to the  
4 fire to mitigate the consequences of the fire,  
5 suppression and detection systems, and then ultimately  
6 recovering the plant to assure that you can get into  
7 a safe condition.

8 We understand there is value to looking at  
9 risk-informed approaches and changes and assumptions  
10 and evaluating them accordingly, but I would recommend  
11 that we not lose sight of the defense-in-depth  
12 concepts as we go through this process going forward.

13 This generic letter is another example of  
14 what is fundamentally flawed with fire protection  
15 regulations and has been a problem with fire  
16 protection regulations and the associated regulatory  
17 process over the last 25 or 35 years.

18 And by that, I mean we have a continuous  
19 evolution of NRC positions and expectations that are  
20 addressed in a somewhat informal manner. And by that,  
21 I mean use of generic communications to articulate  
22 regulatory positions is, quite frankly, inappropriate.

23 New regulatory positions should be  
24 evaluated in terms of safety impact or clearly  
25 demonstrating the compliance issue associated with

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1 that new position. Then that has to be made publicly  
2 available so that the licensees can understand what  
3 these new positions are and what the basis for the  
4 positions are.

5 Historically in fire protection, it's been  
6 a plant-specific fire protection engineer from the  
7 licensee to an NRC inspector agreement of what the  
8 understanding is relative to an interpretation. And  
9 that is the problem that we're trying to fix. That's  
10 why we are so firm in our comments going forward,  
11 because fundamentally, gentlemen, if we don't address  
12 or we don't identify resolution to the spurious  
13 actuation issue today, it will be an issue for the  
14 NFPA 805 plants.

15 Going to 805 does not provide a resolution  
16 to this issue today because there is no understood  
17 methodology that can address the staff's position. I  
18 want to make that very clear.

19 MEMBER APOSTOLAKIS: Is this the  
20 open-ended issue that we discussed earlier?

21 MR. MARRION: Yes, yes. The comments made  
22 about CRGR approval of this generic letter, as an  
23 external stakeholder, that essentially is meaningless  
24 to us, reason being we are not privy to any kind of  
25 disciplined process that is used by CRGR or anyone

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1 within the NRC that clearly demonstrates this is the  
2 basis for the safety concern or this is the basis for  
3 the compliance concern.

4 What we have seen over the years -- and  
5 this is another example -- where the preferred route  
6 appears to be, well, let's make it a compliance  
7 concern because we as a regulatory agency, the NRC,  
8 can interpret the regulations. We have the right to  
9 interpret the regulations, et cetera, which is fine,  
10 but let's put the interpretation on paper. Let's  
11 identify resolution path so we have a common  
12 understanding going forward. We don't have that today  
13 on this particular issue.

14 Lastly, I would like to say that there  
15 isn't a generic letter that is simply a request for  
16 information. It should be clear from the discussion  
17 this morning that this generic letter basically  
18 imposes a new regulatory requirement that has  
19 significant impact on the licensing basis of current  
20 plants. That is not a request for information.

21 Those are the comments that I wanted to  
22 make this morning. I don't know if you have any  
23 questions on anything I said.

24 MEMBER DENNING: Yes, we do have some.  
25 One of them has to do with the timing, the 90 days,

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1 and the timing required to do the kind of analysis  
2 that's being requested there. Do you have a feeling  
3 as to what an appropriate time would be?

4 I mean, there's a timing that says, are  
5 you in compliance with this, which, regardless of this  
6 question, whether it's a new regulation or an old,  
7 there's no question the plant can determine that  
8 fairly quickly. But doing the entire analysis and  
9 determining what affected SSCs are, do you have any  
10 indication from the plants as to how much time that  
11 might take and what an appropriate time frame would be  
12 for a response like --

13 MR. MARRION: I don't have the information  
14 to answer the question, but I would submit that the  
15 next two individuals may be able --

16 MEMBER DENNING: May be of help on it?

17 MR. MARRION: -- to give you their  
18 perspectives.

19 MEMBER DENNING: Okay. Good.

20 MEMBER MAYNARD: Could I just --

21 MEMBER DENNING: Yes?

22 MEMBER MAYNARD: Your perspective comment  
23 was made that if the generic letter is not issued,  
24 then it would just have to be dealt with in inspection  
25 space. Do you have any comment on that?

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1 MR. MARRION: It is being dealt with in  
2 inspection space. Now, what we don't have is an  
3 external stakeholder. When I mention "we," I'm  
4 speaking of NEI and the industry. What is the safety  
5 case or what is the compliance case? And we haven't  
6 seen evidence of that clearly demonstrated that NRC  
7 action in this particular area is necessary in an  
8 expedited manner.

9 VICE CHAIRMAN SHACK: Just to address your  
10 methodology question, apparently you can deal with  
11 multiple actions if they come sequentially. So you  
12 have a methodology for that. And you're arguing that  
13 there isn't a methodology.

14 So it isn't necessarily the open-endedness  
15 of it that's the problem?

16 MR. MARRION: There isn't a methodology  
17 for addressing all spurious actuations in a given  
18 fire. Utilities had --

19 VICE CHAIRMAN SHACK: You can address them  
20 one at a time.

21 MR. MARRION: You can address them one at  
22 a time. And I would ask that the two utility  
23 representatives explain their methodology for circuit  
24 analysis. I think we would find that very insightful.

25 MEMBER DENNING: Good.

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1 MR. MARRION: But it's changed. And then  
2 what I would like to do is ask Dave Miskiewicz from  
3 Progress Energy and Harry Barrett from Duke Power.

4 CHAIRMAN WALLIS: I would bring up the  
5 point before you leave --

6 MR. MARRION: Yes?

7 CHAIRMAN WALLIS: You talked about the  
8 role of a generic letter and whether it just requests  
9 information. We have another generic letter on sumps,  
10 which you may be aware of, right?

11 MR. MARRION: I am generally aware of that  
12 one.

13 CHAIRMAN WALLIS: It not only requested  
14 information. It requested analysis, and it requested  
15 plans. And, in fact, it's resulted in large changes  
16 in the plant by a result of a generic letter.

17 MR. MARRION: Yes.

18 CHAIRMAN WALLIS: So it's not as if this  
19 is a unique generic letter, which is actually asking  
20 plants to do much more than just supply information.

21 MR. MARRION: My only point is a request  
22 for information as this generic letter is  
23 characterized as a mischaracterization of what its  
24 impact is.

25 CHAIRMAN WALLIS: Well, it clearly isn't

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1 that. I mean, it says a request for information and  
2 taking additional actions. I mean, the sentence asks  
3 for more than just information.

4 MR. MARRION: Okay?

5 MEMBER DENNING: Okay. Let's have our  
6 visitors come up.

7 MR. FRUMKIN: If I could add? This is Dan  
8 Frumkin. Just one point. The inspections started  
9 again in January of 2005, but there is still currently  
10 enforcement discretion for all circuit findings. And  
11 so there may be a perception that this has not turned  
12 into an issue yet because of a lack of enforcement in  
13 this area.

14 So starting in September 2006, enforcement  
15 will proceed for plants that do not have enforcement  
16 discretion under NFPA 805. So I just want to put that  
17 out there that currently there are no enforcement  
18 actions in this area for plants that take compensatory  
19 measures and have correction action plans.

20 MEMBER DENNING: Introduce yourselves,  
21 please.

22 MR. BARRETT: Good morning. My name is  
23 Harry Barrett. I work at Duke Power. I'm the  
24 three-site lead for NFPA 805 transition for all three  
25 of these sites in Duke Power's nuclear fleets. I just

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1 wanted to say a few words about the multiple spurious  
2 issue as it affects 805.

3           Although 805 is a risk-informed,  
4 performance-based rule, it is based on your current  
5 licensing basis going forward. And if that is  
6 questionable, then your regulatory foundation that  
7 you're billing it on would be questionable in 805,  
8 which ends up leading to a lot more effort and a lot  
9 more analysis required for that.

10           So this multiple spurious issue is adding  
11 a significant amount of paperwork and analysis to 805  
12 transition. The original concept was you would take  
13 your fire protection licensing basis, map it over to  
14 the 805 requirements, and it was pretty much just a  
15 paper transition.

16           With this new multiple spurious and the  
17 complications that that adds to the fire PRA, we're  
18 looking at a significant amount of engineering effort  
19 that goes into that.

20           It's going to take us over two years to do  
21 the transition for Oconee, which is the first plant.  
22 And a lot of that, most of that, is the PRA in the  
23 multiple spurious issue.

24           MEMBER APOSTOLAKIS: Do you agree that it  
25 is an issue?

1 MR. BARRETT: I agree that it needs to be  
2 looked at. I have not seen a multiple spurious  
3 scenario that is risk-significant yet.

4 MEMBER APOSTOLAKIS: Do any of your plant  
5 have a detailed fire PRA?

6 MR. BARRETT: We have a fire PRA. We have  
7 --

8 MEMBER APOSTOLAKIS: Not IPEEE, though?

9 MR. BARRETT: We had an early '80s vintage  
10 fire PRA, but we are putting together a NUREG 6850,  
11 the new version of it.

12 MEMBER APOSTOLAKIS: Okay. So --

13 MR. BARRETT: We're doing that now.

14 MEMBER APOSTOLAKIS: It would be, then,  
15 possible for you to go back to that PRA and see what  
16 happens if you assume multiple --

17 MR. BARRETT: It assumed multiple in the  
18 original analysis. To use the core melt, we needed to  
19 use multiples for that particular analysis. So it  
20 included --

21 MEMBER APOSTOLAKIS: The number came out  
22 okay?

23 MR. BARRETT: It came out relatively high.  
24 I don't remember the exact number, but fire was a  
25 fairly significant contributor to risk in the --

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1 MEMBER APOSTOLAKIS: Not fire overall,  
2 but, I mean, this particular mode with --

3 MR. BARRETT: Spurious?

4 MEMBER APOSTOLAKIS: Yes.

5 MR. BARRETT: If I remember right, many of  
6 the combinations that we analyzed were within the  
7 bounds of the Appendix R analysis originally for  
8 control room evacuation. The main fire area that we  
9 got into trouble with the IPEEE or the fire PRA, the  
10 original one, was in our cable shaft going up to the  
11 control room, where we had just about every cable in  
12 the plant going through one area. And so --

13 MEMBER APOSTOLAKIS: It seems to me that  
14 --

15 CHAIRMAN WALLIS: Did you assume multiple  
16 spurious actuations, simultaneous, and all of this?

17 MR. BARRETT: In that particular PRA, we  
18 ended up having to go to multiple spurious actuations  
19 in order to get the core damage.

20 CHAIRMAN WALLIS: Okay. Including  
21 simultaneous actuations.

22 MEMBER APOSTOLAKIS: So it would be  
23 interesting, then, to compare your numbers and  
24 analysis with the bounding analysis that the NRC staff  
25 has done to see which one makes sense.

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1 I mean, it seems that we do have a body of  
2 knowledge there that at least I as a member of this  
3 Committee don't seem to have access to. I don't know  
4 whether the rest of the members are familiar with it,  
5 but I doubt it.

6 So, I mean, it would be nice to see that,  
7 especially since you have done it already, I mean.

8 MR. BARRETT: Yes. The original analysis  
9 was nowhere the rigor that 6850 requires now.

10 MEMBER APOSTOLAKIS: I understand that.  
11 I mean, you --

12 MEMBER SIEBER: It is just one plant. So  
13 it's not clear to me how you can extend that to some  
14 --

15 MEMBER APOSTOLAKIS: Yes. But it provides  
16 a basis for judging what Ray Gallucci did.

17 MEMBER SIEBER: It gives you an idea.

18 MEMBER APOSTOLAKIS: Yes. And also what  
19 kind of effort it takes to do it because under NFPA  
20 805, it seems to me that if you find -- as I recall.  
21 Maybe I'm wrong. As I recall, you're right. You're  
22 supposed to meet the regulations, but if you don't  
23 meet some of them, then you can argue in risk space.

24 MR. BARRETT: Right.

25 MEMBER APOSTOLAKIS: Right?

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1 MR. BARRETT: Right.

2 MEMBER SIEBER: You don't need to.

3 MEMBER APOSTOLAKIS: But you don't need to  
4 go back and comply. So, I mean, there is a way out of  
5 it depending on the quality of the risk assessment.

6 MEMBER SIEBER: That would be a basis for  
7 an exemption, but you can't just sit there and do  
8 nothing.

9 MEMBER APOSTOLAKIS: But is that  
10 consistent with a statement that it does a lot of  
11 work, paperwork? I mean, if you already have the PRA,  
12 why does it add a lot of work? But you just said  
13 that, right?

14 I'm sorry. I don't remember your name.

15 MR. BARRETT: Harry.

16 MEMBER SIEBER: The PRA is not  
17 state-of-the-art.

18 MR. BARRETT: Right. The original PRA is  
19 not state-of-the-art.

20 MEMBER SIEBER: They have to do the work.

21 MR. BARRETT: The one that they are doing  
22 now is state-of-the-art. They're using 6850 and --

23 MEMBER APOSTOLAKIS: When do you expect it  
24 to be completed?

25 MR. BARRETT: It should be complete by

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1 probably June of next year.

2 VICE CHAIRMAN SHACK: When you do your  
3 state-of-the-art PRA, you're going to consider  
4 multiple actuations, right?

5 MR. BARRETT: Yes.

6 MEMBER APOSTOLAKIS: Yes. So, I mean, is  
7 it clear to everyone? I mean --

8 MR. BARRETT: We are taking significant  
9 efforts to make sure we get our best chance at finding  
10 those multiple spurious risk --

11 VICE CHAIRMAN SHACK: But it seems to me  
12 that anybody doing a fire PRA is going to have to  
13 consider multiple --

14 MEMBER DENNING: Do they have to consider  
15 them as comprehensively as here? Because they will  
16 have screening criteria. And I guess can you tell me  
17 if you weren't -- you know, suppose you were not  
18 heading towards that.

19 If you are sitting there and you had to do  
20 this analysis, how long would it take you to do this  
21 analysis? And how difficult would it be to -- would  
22 you have to modify the plant to be able to accommodate  
23 it?

24 MR. BARRETT: I am not sure about that.  
25 What we would probably end up doing is using the

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1 guidance in NEI-0001, chapter 4, which is the risk  
2 analysis piece of that, which is, in essence, doing a  
3 mini PRA for the --

4 MEMBER DENNING: But you're not allowed to  
5 use that. I mean, by this generic letter, you're only  
6 allowed to do that if you're then going to look for  
7 exemptions.

8 MR. BARRETT: Right, yes. You're not  
9 doing 805. That's your only other --

10 MEMBER DENNING: Yes.

11 MR. BARRETT: I mean, you need to modify  
12 the plant or you --

13 MEMBER DENNING: Modify the plant. How  
14 long would it take you to do that analysis in --

15 MR. BARRETT: Guessing, I would say  
16 probably a year.

17 MEMBER DENNING: Probably a year. I mean,  
18 what is in here says 90 days.

19 MR. BARRETT: No way.

20 MEMBER DENNING: There's no way?

21 MR. BARRETT: No way.

22 MEMBER DENNING: You would think that --

23 MEMBER SIEBER: Well, you can tell in 90  
24 days roughly how long you think it's going to take you  
25 to do it.

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1 MEMBER DENNING: Absolutely.

2 MEMBER SIEBER: But that's not what  
3 they're asking.

4 MEMBER DENNING: But that's not what  
5 they're asking.

6 MR. BARRETT: I mean, your choices are to  
7 take your safe shutdown analysis and just say that  
8 everything in a given fire areas fails immediately.

9 MEMBER SIEBER: That is the way you used  
10 to do it.

11 MR. BARRETT: And you can't do it.

12 MEMBER SIEBER: No.

13 MR. BARRETT: I mean, with the acceptance  
14 criteria you have in Appendix R, having water level go  
15 out of the pressurizer, you can do that with just a  
16 couple of spurious actuations. If you do all of them,  
17 you're never going to make it. So I don't know how  
18 you do that in 90 days.

19 MR. WOLFGANG: This is Bob Wolfgang with  
20 again --

21 MEMBER DENNING: Go ahead, Bob.

22 MR. WOLFGANG: The 90 days, what we have  
23 currently in the generic letter is for functionality  
24 assessment. To submit any exemption requests,  
25 amendment requests, that's the six-month period.

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1 MEMBER DENNING: Yes, but what I am  
2 missing is to do the functionality assessment, don't  
3 you have to do basically the analysis?

4 MR. BARRETT: Yes. That is essentially an  
5 operability assessment. Are components operable? In  
6 order to know that, you have to do the analysis to  
7 know what gets damaged and when. There's no way  
8 you're going to do that in a short time, no way.

9 MEMBER DENNING: Dave, did you want to  
10 make some comments?

11 MEMBER SIEBER: Before we switch, one  
12 thing that you said that I think is important is you  
13 really can't get the core damage unless you have  
14 multiple spurious actuations.

15 MR. BARRETT: We have some singles that  
16 get us in trouble, and we're going to have to fix  
17 those. But as far as getting into the core damage,  
18 I'm not even sure --

19 MEMBER SIEBER: This would be opposing  
20 trains, too, right?

21 MR. BARRETT: Well --

22 MEMBER SIEBER: Train A, train B pairs.

23 MR. BARRETT: By the fire PRA methodology,  
24 you're really not even worrying about 3G2 or 3G3  
25 anymore. You're looking at fires anywhere and damage

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1 to all of the circuits.

2 MEMBER SIEBER: Right.

3 MR. BARRETT: So you're really looking at  
4 controlling fires and cable room fires and all of  
5 that. And, you know --

6 MEMBER SIEBER: But if you were to make  
7 the assumption that you only have one spurious  
8 actuation, you wouldn't get the core damage. And you  
9 could just say, "I don't need to do anything," right?

10 MEMBER APOSTOLAKIS: Well, it depends on  
11 what else fails.

12 MR. BARRETT: Yes. I think it depends  
13 largely on --

14 MEMBER SIEBER: It would be an on-fire --

15 MR. BARRETT: -- what other failures --

16 MEMBER SIEBER: -- a non-fire-induced  
17 failure, right?

18 MEMBER DENNING: There has to be a core  
19 damage frequency, though. I mean, when you said you  
20 wouldn't get core damage frequency with a single  
21 failure, you have to because you have other unrelated,  
22 but it's just very low.

23 MR. BARRETT: Also we are talking hot  
24 shorts here, but you also have fire-related damage,  
25 which takes the component out of service, which is not

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1 included in that spurious operation probability.

2 So it's a much more complicated things to  
3 get your arms around as far as loss of all electrical  
4 power, loss of indication, and all of that. It's more  
5 than that.

6 MEMBER DENNING: Yes?

7 MEMBER SIEBER: Thanks.

8 MEMBER DENNING: Dave?

9 MR. WOLFGANG: Excuse me.

10 MEMBER DENNING: Yes?

11 MR. WOLFGANG: This is Bob Wolfgang again.

12 So Duke's response to this generic letter  
13 would be we're addressing it. We're transition to  
14 NFPA 805. And we're going to address multiple  
15 spurious actuations in that transition.

16 MR. BARRETT: Yes, sir.

17 MR. WOLFGANG: And that is the total  
18 response we're looking for from --

19 MR. BARRETT: We will give you a schedule  
20 of when we think that will be done, yes.

21 MEMBER DENNING: Okay. If that is what  
22 you are asking for, you're going to have to change the  
23 generic letter.

24 MR. BARRETT: No.

25 MEMBER DENNING: My interpretation. Well,

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1 we'll look at that.

2 Dave, why don't you go ahead and say a few  
3 words?

4 MR. MISKIEWICZ: Okay. My name is Dave  
5 Miskiewicz. I'm from Progress Energy. I'm the lead  
6 PRA supporting the transition to 805 at all of our  
7 units.

8 MEMBER APOSTOLAKIS: PRA?

9 MR. MISKIEWICZ: I'm the lead PRA engineer  
10 supporting our transition.

11 MEMBER APOSTOLAKIS: I thought you said  
12 "elite."

13 (Laughter.)

14 MR. MISKIEWICZ: That does sound good.

15 A lot of the discussion I'm hearing, my  
16 perspective is probably a little bit different than  
17 the normal compliance.

18 MEMBER APOSTOLAKIS: That's why we want  
19 it.

20 MR. MISKIEWICZ: You know, there is  
21 uncertainty. And I am used to dealing with the  
22 uncertainty as how much probability I can assign to  
23 something, can I take credit for these actions and all  
24 the various things on there.

25 One of the things that strikes me is when

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1 I look at the bounding analysis and it seems like  
2 we're trying to get the best of both worlds. We want  
3 to address everything in totality and also assure that  
4 we don't have that risk.

5 You know, when I deal with traditional  
6 design basis, we are allowed one single failure. And  
7 we assume no off-site power. And we give an  
8 initiating event that happens, and that is a given.

9 PRA, we will look at multiple failures.  
10 And we may find things that are more vulnerable that  
11 weren't even addressed under compliance. And I see  
12 kind of a similar thing here except for instead of  
13 saying, "Address a single failure," we're looking at  
14 "You've got to find them all."

15 And that just seems like an impossible  
16 task. Even in the PRA world, we can model a lot of  
17 stuff, but we're still not going to get them all. But  
18 we try to find the significant things. We're trying  
19 to gear down to get the significant issues.

20 As far as the workload goes that I see on  
21 the generic letter, I think it would be significant.  
22 I'm not the circuit analysis person but when I start  
23 throwing in non-currently credited equipment into that  
24 list that I want circuits routed for and cables routed  
25 for, it is a big workload for the electrical guys who

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1 are going to be doing that work. And I would see that  
2 as a resource drain on the overall transition effort  
3 for me.

4 In fact, if I saw them, you know, all of  
5 a sudden, focusing on one area and not another area,  
6 I'm not even sure how they would be able to get all of  
7 them without doing the PRA perspective.

8 MEMBER APOSTOLAKIS: I am a little bit --  
9 I don't know what the right word is, but we keep  
10 talking about the workload. It seems to me we should  
11 be talking about the real issue.

12 Is there a real issue here? Is there a  
13 contributor to risk that we have not handled in the  
14 past or managed well? I mean, the workload I'm sure  
15 you will agree, too, it's a major contributor to risk.  
16 We have to do something about it.

17 MR. MISKIEWICZ: I agree.

18 MEMBER APOSTOLAKIS: And, you know, the  
19 thing that made me happy with Duke is that they are  
20 doing the PRA. They will consider the multiple hot  
21 shorts or spurious situations. Is your company doing  
22 something similar or --

23 MR. MISKIEWICZ: We are doing the PRA.  
24 And we're going to in the PRA model the hot shorts,  
25 the spurious actuations.

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1 MEMBER APOSTOLAKIS: According to the  
2 latest information we have and everything?

3 MR. MISKIEWICZ: When we say important,  
4 too, it's almost, you know --

5 MEMBER APOSTOLAKIS: You're not going to  
6 use .1? You're going to use .6, for example?

7 MR. MISKIEWICZ: We'll use whatever the  
8 methodology recommends.

9 MEMBER BONACA: You can go to Professor  
10 Apostolakis if you remember.

11 MEMBER APOSTOLAKIS: Give me a call. I'll  
12 tell you.

13 (Laughter.)

14 MR. MISKIEWICZ: It's .1. And we're  
15 working through those issues, but even doing that is  
16 going to be limited somewhat. You know, there are  
17 screening techniques and things used that we're going  
18 to work our way through as to which circuits really  
19 need to be evaluated.

20 MEMBER DENNING: Do you think the approach  
21 is clearly defined as to how you come up with a  
22 probability for these actuations?

23 MR. MISKIEWICZ: Right.

24 MEMBER DENNING: There is some randomness  
25 that one assumes in terms of which circuits can

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1 connect with which other circuits to --

2 MR. MISKIEWICZ: I think what we know now  
3 is better than what we knew ten years ago when we were  
4 dealing with this.

5 MEMBER DENNING: Yes. But it isn't  
6 obvious to me even what the best approach is to doing  
7 that within the fire PRA, let alone deterministically.

8 MEMBER APOSTOLAKIS: So the position,  
9 then, of at least you two gentlemen and maybe the  
10 industry is that this generic letter is unnecessary,  
11 that you are handling the issue of multiple spurious  
12 actuations via the PRA and as you transition to it --  
13 are you transitioning to 805?

14 MR. MISKIEWICZ: Yes, we are.

15 MEMBER APOSTOLAKIS: As you transition to  
16 805, you may have to come back to the NRC and, using  
17 risk arguments, request an exemption of some sort. Is  
18 that your position?

19 MEMBER BONACA: Well, I heard it  
20 differently.

21 MEMBER APOSTOLAKIS: What?

22 MEMBER BONACA: I heard it differently.  
23 I heard simply that the burden should be on the NRC to  
24 perform. Okay.

25 MEMBER APOSTOLAKIS: But they are handling

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1 it already.

2 MEMBER BONACA: Yes.

3 MR. BARRETT: We are handling multiple  
4 spurious in the PRA as part of the 805 transition.

5 MEMBER APOSTOLAKIS: And then what?

6 MR. BARRETT: And then we're going to  
7 follow the industry guidance and the regulatory  
8 guidance provided by the NRC. And depending upon  
9 where the thresholds fall in relation to the  
10 self-approval thresholds, if it's less than the  
11 self-approval threshold, then we'll end up  
12 self-approving an exemption in accordance with the NRC  
13 rules for 805 implementation.

14 MEMBER APOSTOLAKIS: Right, right.

15 MR. BARRETT: If it's over that threshold,  
16 then we'll end up having to --

17 MEMBER APOSTOLAKIS: Come back.

18 MR. BARRETT: -- contact the staff and  
19 work out whether we have to modify or whether we can  
20 leave the situation as is.

21 MEMBER APOSTOLAKIS: The conclusion one  
22 can draw from this is that you believe that this  
23 generic letter is unnecessary because there is already  
24 a process in place. Is that correct?

25 MR. BARRETT: For 805, for their plants.

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1 Not everyone is --

2 MEMBER APOSTOLAKIS: Why wouldn't another  
3 plant apply the same thing?

4 MEMBER SIEBER: It is an optional process.  
5 Some plants --

6 MEMBER APOSTOLAKIS: Oh, they don't --

7 MEMBER SIEBER: -- may decide not to do  
8 anything at all.

9 MEMBER APOSTOLAKIS: If they don't  
10 transition to 805, you mean?

11 MEMBER SIEBER: Yes.

12 MR. MARRION: If I may, Dr. Apostolakis,  
13 there are 40 plants that have submitted letters of  
14 intent to the NRC. The resolution of this issue for  
15 the 805 plans has yet to be determined. The approach  
16 is the use of the PRA, do the modeling -- all right?  
17 -- and then define that.

18 But that would be applicable to those 40  
19 plants. The other plants, the balance of the  
20 industry, have used any combination of the single  
21 failure to three or four failures.

22 You heard mention of NEI-001 that has the  
23 methodology, both -- two methodologies: deterministic  
24 and risk-informed. We piloted that at two plants.

25 And so we can't take credit for that

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1 anymore because of this new position with the generic  
2 letter. But I suspect that the solution will be had  
3 with the pilot exercise over the next several months  
4 to a year possibly and that that's the solution that  
5 needs to be evaluated for applicability to the non-805  
6 plants because, absent that, I don't see anyone coming  
7 up with a generic solution for the non-805 plants  
8 today. And it is going to be based upon PRA.

9 MR. MISKIEWICZ: Even in 805, though, when  
10 we do a fire PRA, there will be some iterative  
11 process. You know, we're dependent on the circuit  
12 analysis people giving us the information that we need  
13 to model. And so we're going to try to get risk to  
14 make sure we're modeling the right areas.

15 MEMBER SIEBER: Just the basic methodology  
16 of PRAs causes you to consider multiple spurious --

17 MR. MISKIEWICZ: If you model all of your  
18 singles and multiples from singles --

19 MEMBER SIEBER: That's the way it is.

20 MEMBER APOSTOLAKIS: But in the old days,  
21 in the first PRAs, I don't think we considered that.

22 MR. MISKIEWICZ: You modeled your singles.  
23 And they would combine in your results to give you  
24 multiples.

25 MEMBER SIEBER: Part of the process.

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1 MR. MISKIEWICZ: Yes. But you would still  
2 have to model the spurious event was a failure mode  
3 for that specific piece of equipment, --

4 MEMBER SIEBER: Right.

5 MR. MISKIEWICZ: -- which depends on the  
6 circuit analysis people telling you where that --

7 MEMBER SIEBER: So the philosophical  
8 discussion as to what the assumptions ought to be is  
9 sort of moot because the process of the PRA itself  
10 takes care of that if it's done thoroughly and done  
11 right.

12 MEMBER APOSTOLAKIS: One of the things  
13 that we don't do at this Committee is have  
14 presentations or briefings on the actual analysis that  
15 the industry is doing.

16 MEMBER SIEBER: Right.

17 MEMBER APOSTOLAKIS: I think that would be  
18 extremely beneficial to us if somehow we found a way  
19 to have the industry come and present a detailed PRA,  
20 fire PRA in this case. Anyway, that's a separate  
21 issue.

22 MEMBER DENNING: I think what we would  
23 like to do at this point is thank you gentlemen. And  
24 we may still ask you in the few minutes that we have  
25 left if we have some additional questions. We have

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1 the potential to hear about additional experimental  
2 work that could potentially change some perspectives,  
3 but I don't think we'll do that.

4 I think what we ought to do now is we  
5 would have some discussion while we still have the  
6 staff here and the industry here, we have some  
7 discussion? Would you agree, Graham, that we'll have  
8 some discussion here, see just kind of where we are  
9 sitting on this?

10 CHAIRMAN WALLIS: I was thinking about  
11 that. I think we certainly need discussion.

12 MEMBER SIEBER: Yes.

13 CHAIRMAN WALLIS: I think some of it needs  
14 to be in our working session, --

15 MEMBER DENNING: Yes.

16 CHAIRMAN WALLIS: -- rather than open  
17 session, but I think we can do some of it now. What  
18 little bit we can do now to clarify the situation  
19 certainly we should do now.

20 MEMBER ARMIJO: I have a question that may  
21 not be a discussion. Just in reading the staff's  
22 response to a lot of the comments received on the  
23 draft, there was reference to a lot of -- where is  
24 this thing, the screening tool, a risk screening tool,  
25 that the licensees develop a risk screening tool to be

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1 reviewed and approved by the staff.

2 This is a tool that would evaluate a  
3 variety of different multiple spurious actuations and  
4 sort them out and say, "These are the ones to worry  
5 about. And the rest we don't have to worry about."

6 What is your view? Does such a tool  
7 exist? Do you use such tools, both parties?

8 MR. MISKIEWICZ: We haven't kind of gotten  
9 to that step yet. I'm not exactly sure what the  
10 paragraph is you are referring to.

11 MEMBER ARMIJO: Yes. It's --

12 MR. MISKIEWICZ: But we can do  
13 sensitivities and say, "If I just fail the system, you  
14 know, a functional type of thing, if it's not  
15 significant, then I don't have to go down deeper and  
16 model all the individual spurious. I can screen it by  
17 saying it's not going to matter without doing the  
18 detailed modeling," you know.

19 MEMBER APOSTOLAKIS: The screening depends  
20 on a number of factors, this being one, but the other  
21 is the amount of fuel you have in your area, whether  
22 you can have a fire to begin with, the fire PRA.

23 MEMBER ARMIJO: I thought it was here is  
24 a large number of conductors that can cause spurious  
25 actuations of a large number of systems. And nobody

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1 has defined what scenarios are worrisome. It seems to  
2 me like it's a large number of mind-boggling barriers.  
3 And how do you sort those all?

4 MR. BARRETT: Let me address that.

5 MEMBER ARMIJO: Yes.

6 MR. BARRETT: One of the things that Duke  
7 has done -- and I think Progress is going to follow  
8 suit when they actually do their PRA -- is we have  
9 attempted to put our arms around the most significant  
10 multiples that we could think of by putting together  
11 an expert panel of people who know the plant, know the  
12 Appendix R design, no fire protection, and postulate  
13 these in an organized fashion, like going through  
14 PNIDs and plant design records to say, "All right.  
15 What are the real multiple spurious combinations that  
16 would really hurt me?" and capture those in scenarios  
17 so that they can be analyzed in detail in the fire PRA  
18 so that we can really look at the risk.

19 We're looking at it taking a three-pronged  
20 approach. We have the Appendix R analysis that says,  
21 "Here is all the safe shutdown stuff that I've got to  
22 have. Here are the cables and where they go in the  
23 plant. And then here is what gets damaged in each  
24 fire area."

25 And we take the expert panel. And we say,

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1 "Well, is there anything we missed? You know, is  
2 there something out there that because you end up  
3 flushing the toilet over here and you end up turning  
4 that light bulb on, the combination of things gets you  
5 something you didn't expect?" The expert panel is  
6 supposed to deal with that.

7 And then we also look at the PRA and true  
8 up all AOVs, true up all MOVs, and see if those kinds  
9 of things give us surprises that we didn't expect.  
10 Between the three of those, we think we're going to  
11 end up probably having 95 percent of the  
12 risk-significant scenarios.

13 MEMBER DENNING: For all of your plants,  
14 do you know where your cables are by tray?

15 MR. BARRETT: We didn't. We ended up  
16 having to pay to have that analysis done for us. I  
17 think it was originally determined in the '80s but was  
18 not captured in a database or anything. And we had to  
19 go back and --

20 MEMBER DENNING: But you had that for all  
21 your plants, do you?

22 MR. MISKIEWICZ: I wouldn't say all of the  
23 plants. That's a lot of work. In a lot of cases it's  
24 limited to the set of equipment that met the rule for  
25 the Appendix R compliance --

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1 MEMBER DENNING: It seems to say that --

2 MR. MISKIEWICZ: -- or our equipment that  
3 we want to credit from PRA perspective because there  
4 is risk-significant equipment in mitigation that is  
5 not within the scope of Appendix R right now. And  
6 that we'll add to the list. And some of those still  
7 need to be routed.

8 MEMBER DENNING: You do have additional  
9 cable routing that you would have to determine;  
10 whereas, you feel that you have already done the --

11 MR. BARRETT: There were some things in  
12 the PRA that we had not addressed in safe shutdown,  
13 and we're going to have to have --

14 MEMBER DENNING: Well, PRA is one thing.  
15 What about with this requirement? Does that change?  
16 Would you have to -- if this was imposed on you, do  
17 you think you have to do more cable tracing?

18 MR. BARRETT: What I'm talking about is  
19 our attempt to try to get our arms around all of the  
20 risk-significant scenarios.

21 MEMBER DENNING: Scenarios? Okay.

22 MR. BARRETT: So that's why we did the  
23 expert panel and all of that, to try to get our arms  
24 around things that we would have otherwise missed.

25 MEMBER DENNING: You keep saying

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1 "risk-significant." And we're in a space here where  
2 we're not necessarily risk-significant. It's broader  
3 than that.

4 MR. BARRETT: I think if you take all of  
5 the cables and you just fail them all and you say they  
6 all happen immediately, you're done.

7 MEMBER DENNING: You can't survive.

8 MR. BARRETT: Some of these areas you  
9 can't survive it.

10 MEMBER DENNING: Okay.

11 MEMBER SIEBER: On the other hand, from a  
12 risk standpoint, the set of cables that you have to  
13 know what the routing is becomes larger than the  
14 Appendix R set.

15 MR. BARRETT: Yes.

16 MEMBER SIEBER: But it is certainly not  
17 all of the cables. So there is going to be some  
18 physical work that has to be done if you don't have  
19 pull ticket. If you don't have the database, you  
20 can't --

21 VICE CHAIRMAN SHACK: In the NEI-001  
22 guidance, where, as I understand it, you do up to four  
23 failures, how do you select those four?

24 MR. BARRETT: A similar process with the  
25 expert panel and using Appendix R analysis, a similar

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1 process.

2 MR. FRUMKIN: This is Dan Frumkin from the  
3 staff.

4 One of the things that we have discovered  
5 about defining a failure is a lot of the analyses  
6 assume once spurious actuation, once spurious  
7 actuation, what the NEI or at least the risk, 2,403 --  
8 and I think NEI-001. They talk about multiple hot  
9 shorts.

10 Now, one pair of conductors coming  
11 together could cause numerous different spurious  
12 actuations. So I think that the staff and the --  
13 well, the staff has come out with 2,403 and has put it  
14 on the table.

15 We are looking for this hot short. That  
16 could cause whatever it could cause. We're not  
17 counting spurious actuations anymore. We're taking  
18 that hot short and saying, "Well, what could it  
19 cause?"

20 I think there was a situation where there  
21 was one cable or just a number, just a few conductors,  
22 or maybe it was even two conductors that could give an  
23 indication which could open all of 16 SRVs at one  
24 plant.

25 Now, a long time ago that might have been

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1 16 separate spurious actuations. And today we're  
2 looking at that as one pair of conductors coming  
3 together. And I think everybody is pretty much on the  
4 same page that yes, obviously if the circuits can  
5 cause all of those spurious actuations, we consider  
6 that.

7 MEMBER DENNING: Well, I guess a comment  
8 that I would have on generally what I have heard is  
9 that I think it's very clear that there are timing  
10 issues. If we go forward with the generic letter,  
11 then, at least in my interpretation of the generic  
12 letter, there are timing requirements that are not  
13 doable by the industry and that one would have to do  
14 some relaxation of that. And I don't see where just  
15 having the 30-day, where they can say, "It's going to  
16 take me longer as appropriate."

17 Now, it could be that maybe this should be  
18 more of an information-gathering generic letter,  
19 rather than one that is quite forcing the NRC's  
20 position about the need for multiple spurious  
21 actuations without a more relaxed position like NEI's.

22 I guess what I'm looking for are general  
23 comments as to people, where they are seemingly  
24 falling on this generic letter.

25 MEMBER MAYNARD: Well, I would agree with

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1 most of your comments there. First of all, I do  
2 believe that it clearly constitutes a backfit. We  
3 will get into some other things later on that, but we  
4 don't have to change regulations to be changing  
5 requirements. A change in staff position on what is  
6 acceptable for meeting a regulation, changing those  
7 position, also constitutes a backfit.

8 With that said, I would also like to say  
9 that this issue needs to be resolved. I think playing  
10 around too long about what is the right regulatory  
11 process isn't going to serve everybody's best interest  
12 either.

13 I think it is important. This issue has  
14 been around for 25 years. It needs to get resolved in  
15 an approach going forward as to what is it going to  
16 take to either make it go away as an issue or to  
17 actually fix it.

18 I think the 90 days, I think basically if  
19 it goes out the way it is, basically you're going to  
20 end up with everybody coming in with time request  
21 extensions. And so I don't think that's really the  
22 right thing to do there.

23 If it goes out the way it is, I think it  
24 needs to extend that time. I think it might be better  
25 to go out with what is truly an information request,

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1 to gather information to then be able to determine  
2 what the next steps are.

3 But, again, I don't think process should  
4 drag out for another 5 or 10 or 15, 20 years.  
5 Something needs to be done to put it on a resolution  
6 path.

7 VICE CHAIRMAN SHACK: Let me just come  
8 back to that for a second. I mean, we know what you  
9 expect from the 40 plants that are going for NFPA 805.  
10 What do you expect from the others?

11 MR. WOLFGANG: This is Bob Wolfgang again.

12 I think a number of them are going to come  
13 back and say, "We meet our licensing basis, and thank  
14 you very much. And good-bye."

15 MEMBER DENNING: Will they really say  
16 that? I mean, your --

17 MR. WOLFGANG: That is one thing.

18 VICE CHAIRMAN SHACK: Will you accept that  
19 answer?

20 MEMBER SIEBER: Send it over to  
21 enforcement.

22 MR. WOLFGANG: No. No, we won't. What we  
23 will hear from others is --

24 VICE CHAIRMAN SHACK: What would you  
25 consider an acceptable response from the others?

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1 MR. WOLFGANG: Well, "We don't address  
2 multiple spurious actuations. Here is our plan to  
3 address it to do" X, Y, Z. I don't know. "Do  
4 physical mods."

5 MEMBER DENNING: That's a six months'  
6 answer.

7 MR. WOLFGANG: Yes. That will be the  
8 six-month answer. But initially, yes, either you meet  
9 it or you don't meet it. We don't think we meet it.  
10 We think we meet it.

11 For the first round, that's all I think  
12 we're going to get.

13 MEMBER DENNING: Getting back to this  
14 backfit question, I'm not sure that ACRS is the  
15 appropriate one to answer that. Obviously it makes it  
16 easier for the regulatory staff if it's not a backfit  
17 question.

18 MEMBER BONACA: Yes. One thing that  
19 troubles me a little bit is, you know, is it a  
20 significant issue or is it not a significant issue?  
21 That's a plant-specific answer. And so we're not  
22 going to find out an answer to the question.

23 And I think that if we had to perform a  
24 generic evaluation to justify a backfit, I'm not sure  
25 that it could be done because, I mean, it's so

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1 specific to the plant, the age, to whatever the  
2 situation may be.

3 MEMBER DENNING: But this question of a  
4 specific issue, I think you can do a reduced analysis  
5 to determine. I think you can screen out stuff a  
6 priori --

7 MEMBER BONACA: I think so, too.

8 MEMBER DENNING: -- you know, so that it  
9 isn't such an onerous job to determine what's  
10 important and what's a potentially significant risk  
11 contributor here.

12 MEMBER BONACA: Clearly, I mean, something  
13 has to be done. I mean, we have new evidence in front  
14 of us. And I completely agree with you, Otto, that it  
15 can't wait. They have to be dealt with.

16 I think that, however, the industry needs  
17 more time to deal with this. They don't have a  
18 ready-made process by which they can screen this out  
19 and address it. So the issue is more the time.

20 Now, the next statement again, as reported  
21 to you, is the fact that we are not really the best  
22 charges of what is the most appropriate regulatory  
23 process to follow to go ahead with this.

24 MEMBER APOSTOLAKIS: Our job here is to  
25 judge the generic letter as presented to us.

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1 MEMBER BONACA: Yes.

2 CHAIRMAN WALLIS: I am just wondering how  
3 we add value to this. If we were a subcommittee, we  
4 might well say, "Look, we now know what the issues  
5 are. We think there must be a better way than having  
6 the agency send out this generic letter asking for  
7 things which may be impractical for some plants," but,  
8 then, there should be some way to work with the plants  
9 to figure out what is the right solution to this  
10 technical problem. I'm not sure.

11 We're also sort of a facilitator between  
12 industry and the agency, and that's not really our  
13 job, though, is it?

14 MEMBER SIEBER: Well, the other thing that  
15 is not our job is to try to figure out whether it's a  
16 backfit or not. That's a legal question.

17 CHAIRMAN WALLIS: Well, we don't even know  
18 how important it is because we don't have these proper  
19 risk analyses.

20 MEMBER DENNING: Well, having resolved  
21 these questions, I now turn it back to you, Mr.  
22 Chairman.

23 (Laughter.)

24 CHAIRMAN WALLIS: I can make a very  
25 decision, which is to take a break for lunch. We are

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1 going to be ethics-trained at 12:15. And then we go  
2 to work again at 1:30. Thank you very much for your  
3 presentations.

4 We'll take a break, and as a Committee,  
5 we're going to be back here, not on the transcripts or  
6 anything, for ethics training at 12:15. We'll start  
7 the official proceedings again at 1:30.

8 (Whereupon, a luncheon recess was taken  
9 at 11:33 a.m.)

A-F-T-E-R-N-O-O-N S-E-S-S-I-O-N

(1:33 p.m.)

CHAIRMAN WALLIS: Back into session. The next item on the agenda is another generic letter; first of all, underground cable failures that disable accident mitigation systems.

Our cognizant member is Mario Bonaca. I will hand over the meeting to him. Please go ahead, Mario.

MEMBER BONACA: Thank you, Mr. Chairman.

3) DRAFT FINAL GENERIC LETTER 2006-XX,

"INACCESSIBLE OR UNDERGROUND CABLE FAILURES THAT  
DISABLE ACCIDENT MITIGATION SYSTEMS"

3.1) REMARKS BY THE SUBCOMMITTEE CHAIRMAN

MEMBER BONACA: We have a presentation from the staff. They are proposing to issue a generic letter on inaccessible underground cable failures that disable accident mitigation systems.

We have recently become conversant with this issue through license renewal. You may remember that the GALL report requires for license renewal the existence of two programs: one, a program to detect the presence of water and the watering actions; and the other one is a program to test the cables and essentially-- so we are aware of the concern here.

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1 And the staff is now addressing this issue in the  
2 current licensing area.

3 And so, with that, I will turn to the  
4 staff. Mr. Mayfield?

5 3.2) BRIEFING BY AND DISCUSSIONS WITH  
6 REPRESENTATIVES OF THE NRC STAFF

7 MR. MAYFIELD: Good afternoon. I'm Mike  
8 Mayfield, the Director of the Division of Engineering.  
9 And my division is sponsoring this generic letter.

10 We're here this afternoon to seek ACRS  
11 endorsement to publish the generic letter. The  
12 generic letter, as Mr. Koshy will describe, provides  
13 some information to licensees on the significance of  
14 these potential failures, and seeks some information  
15 from licensees regarding the monitoring of these  
16 cables.

17 Tom Koshy from the Electrical Engineering  
18 Branch will make the presentation.

19 MR. KOSHY: Thank you, Mike.

20 As Dr. Bonaca mentioned to you, this was  
21 first brought to your attention as a problem during  
22 the license renewal hearing at the ACRS. The question  
23 was, is dewatering every ten years going to prevent  
24 the problem?

25 At that time, in light of the failures

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1 that we had noticed at the time, we thought of taking  
2 it as an operating reactor issue under Part 50. And  
3 we did some serious looking into see how big the  
4 problems are.

5 The safety concerns identified at the time  
6 were some of these underground and inaccessible cables  
7 supply power to some safety-related components. Using  
8 some examples here, the off-site power, the cable that  
9 brings the off-site power, to the safety buses.

10 The second would be the emergency diesel  
11 generator feeder. This is critical in those cases  
12 where the emergency diesel generator to building is  
13 physical apart from the main building so that the  
14 underground cables bring into power; and then the  
15 emergency service water pumps, these cases where the  
16 pump house is located again, you know, physically away  
17 from the plant so that the power supply to the service  
18 water pump has to go through underground cables.

19 And failure of one of these cables could  
20 affect multiple systems in these sense there could be  
21 a train, cooling off of safety systems, collectively  
22 influencing more than just one isolated system.

23 Most of these failures that we came across  
24 did not have any direct reference to having a  
25 qualification for this cable to withstand the moisture

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1 environment or, essentially, you know, in duct banks,  
2 if it is immersed in water, you know, can it  
3 withstand. That type of qualification had not been in  
4 existence for these cables that we came across.

5 MEMBER BONACA: Let me understand now,  
6 however. These are cables in safety-related  
7 applications?

8 MR. KOSHY: Yes.

9 MEMBER BONACA: Okay. So evidently on day  
10 one, when the plant was built, there was no  
11 expectation that the cable would be wetted?

12 MR. KOSHY: Yes. In fact, they thought it  
13 would stay relatively dry, but as duct banks develop  
14 cracks, you know, there would be traffic about it.  
15 And eventually these things crack. And depending on  
16 the water table, you know, it could be immersed for a  
17 long time or maybe a short time.

18 MEMBER BONACA: Well, in many cases, these  
19 cables are buried --

20 MR. KOSHY: Yes.

21 MEMBER BONACA: -- in the ground. So from  
22 day one, there was an expectation that they would see  
23 humidity and why we are not environmentally qualified.

24 MR. KOSHY: Either it was not specified at  
25 the time or they thought that, you know, the existing

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1 material at the time could withstand some level of  
2 moisture. For some reason, they did not specifically  
3 seek out.

4 The reason I stated that is, you know,  
5 much in the later period, now we have cables that can  
6 withstand such highly moist environment. In fact, I  
7 know of a case where they have run the cable to the  
8 river. That's for a --

9 CHAIRMAN WALLIS: But not forever.

10 MR. KOSHY: Excuse me?

11 CHAIRMAN WALLIS: Just because they are  
12 qualified doesn't mean they will survive forever in  
13 this environment.

14 MR. KOSHY: You are right, yes. Yes.  
15 They may not survive forever, but at least, you know,  
16 they have some demonstrated capability for a certain  
17 period that it can be even immersed in water and still  
18 do its function.

19 But all of that addresses, you know, the  
20 possibility that you need to know the condition of the  
21 insulation so that you have that confidence that it  
22 can do its function for the foreseeable future.

23 We went back into the history of the LERs  
24 that we have on record. We saw failure at 17 sites  
25 and cable replacements at 100 or so. And most of the

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1 faulty cables were not discovered until there was an  
2 operational failure.

3 Again, these are based on LERs, where the  
4 system has a redundant system or some reason, because  
5 of a plant trip or the failure was serious enough it  
6 prompted an LER.

7 MEMBER ARMIJO: What is your definition of  
8 a medium cable?

9 MR. KOSHY: 5 kV.

10 MEMBER ARMIJO: And above?

11 MR. KOSHY: 5 kV. Well, in the sense of  
12 when you go into 13 kV, you know, some people label it  
13 as medium also.

14 MEMBER ARMIJO: Okay.

15 CHAIRMAN WALLIS: High tension.

16 MEMBER SIEBER: Four-eighty volts to --

17 MR. KOSHY: Four-eighty will be below  
18 that. Yes. We will not call that medium, yes.

19 MEMBER SIEBER: Four-eighty is --

20 MEMBER BONACA: But you include those?

21 MR. KOSHY: Excuse me?

22 MEMBER BONACA: But you include those in  
23 the --

24 MR. KOSHY: Yes, we are including those  
25 because there are certain plants where the emergency

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1 diesel generator generates voltage at 480 and  
2 emergency service water and safety pumps are at 480  
3 volts, some small plants and early vintage.

4 MEMBER BONACA: Okay.

5 MR. KOSHY: So we wanted to include that  
6 also. That's why we went more than just medium  
7 voltage.

8 The EPRI data indicated about 65 cable  
9 failures. And later the white paper which NEI has  
10 submitted indicated about 55 failures for about 15  
11 plants.

12 Most of the cable failures have what in  
13 common? It's about 12 years of age. And the cable  
14 was subjected to some type of, you know, moisture  
15 environment, probably for a longer duration or a  
16 shorter duration. And these things were essentially  
17 common factors.

18 The cables, again, that we are focusing on  
19 is about roughly about six to eight cables, you know,  
20 depending on the design uniqueness, the cables that  
21 can have the most, let's say, significant impact on  
22 the plant.

23 MEMBER MAYNARD: The cable was about 12  
24 years old? You're saying that all of these failures  
25 were about the same age or --

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1 MR. KOSHY: No. More than that. There  
2 are some 20-plus.

3 MEMBER MAYNARD: Okay. All right.

4 MR. KOSHY: Yes.

5 CHAIRMAN WALLIS: It was at least 12 years  
6 old. At least 12 years. I was trying to figure it  
7 out. If it's every 12 years, that's pretty severe.

8 MR. KOSHY: You're right. Twelve and  
9 above. So in this generic letter, what we are  
10 focusing on is power cables that are within the scope  
11 of the maintenance rule, including cables connected to  
12 off-site power, emergency service water, and the other  
13 examples that I stated before, and those routed  
14 through underground or inaccessible locations, such as  
15 buried conduits, cable troughs, above-ground and  
16 underground. And these are the things that we are  
17 considering to be within the scope of this generic  
18 letter.

19 The benefits of this program are gaining  
20 confidence in the capability of the cable to respond  
21 to design bases events. To give you an example, at  
22 Turkey Point after the hurricane, the diesel had to  
23 run for about a week continuously. And thereafter for  
24 a month's period, the diesel had to come back on for  
25 other spurious power outages.

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1           So if you are looking into an accident  
2 where it has to be on a LOOP condition where these  
3 cables may need to be relied on for a few weeks. So  
4 we are not looking at a few hours of operation. The  
5 confidence needs to be gained for a period much higher  
6 than a few hours, which is usually the subject of our  
7 maintenance and surveillance activities.

8           MEMBER BONACA: Do you have examples of  
9 failures in service that were not exhibited during  
10 functional testing?

11           MR. KOSHY: What we have, the reported  
12 failures are a combination of both. Some in-service  
13 failures certain plants appear to have more than  
14 others. And others, when you start for surveillance,  
15 you find out that, you know, after a couple of hours,  
16 it fails.

17           So the LERs that we recorded are those  
18 cases where the plant impact was significant, so in  
19 the sense either operational. And if it is purely  
20 during a surveillance, we will not get an LER report  
21 on it.

22           So that's some of the problem that we are  
23 facing. The LERs that we received are so limited in  
24 number because, you know, it had to either bring a  
25 plant down or give an easy access situation for us to

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1 plant an LER report.

2 So that's why we are focusing on getting  
3 a handle on the extent of failures so we can engage  
4 them and see what other actions would be necessary.

5 CHAIRMAN WALLIS: Could you explain  
6 something to me?

7 MR. KOSHY: Yes.

8 CHAIRMAN WALLIS: I can understand  
9 off-site power sort of coming in on the underground  
10 cable. Why is diesel generator? Why does the diesel  
11 generator have underground cables? Is it part of the  
12 plant?

13 MR. KOSHY: Yes. For example, in some  
14 plants, the building is a separate building.

15 CHAIRMAN WALLIS: It's in a separate  
16 building. It's in a separate building.

17 MR. KOSHY: Yes. For example --

18 CHAIRMAN WALLIS: Okay.

19 MR. KOSHY: -- they have separate  
20 building.

21 CHAIRMAN WALLIS: They might be in a  
22 separate building?

23 MR. KOSHY: Yes.

24 CHAIRMAN WALLIS: That's very different  
25 from, say, something that comes from off-site power,

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1 where the cable may be a long cable from --

2 MR. KOSHY: Yes. That will be  
3 significantly longer. That will be from the  
4 switchyard. In some cases, you will have a situation  
5 closer to the plant, where you bring down to 13 kVR or  
6 so.

7 CHAIRMAN WALLIS: Okay. Thank you.

8 MR. KOSHY: The next benefit is we can  
9 prevent the unanticipated failures that cause plant  
10 transients by using the maintenance rule as the scope.  
11 We are also looking at challenges to the plant in the  
12 sense of what will give you a plant transient. So  
13 that is what is seen as the scope of this generic  
14 letter.

15 The next is you can use a convenient  
16 outage if you know the rate of degradation. Rather  
17 than taking, you know, unwarranted outages, you can  
18 schedule that cable replacement for a convenient  
19 refueling outage and do the replacement with minimum  
20 interruption.

21 CHAIRMAN WALLIS: Are these cables usually  
22 designed so they can easily be pulled through to  
23 repair them?

24 MR. KOSHY: No. It is very  
25 time-consuming, most of the --

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1 CHAIRMAN WALLIS: There's not a big duct  
2 in the cable and you just drag through a new cable?

3 MR. KOSHY: No.

4 CHAIRMAN WALLIS: No? You have to take it  
5 out? You have to dig it up?

6 MEMBER SIEBER: It's the whole thing. No.

7 MR. KOSHY: Well, pull-through is there,  
8 but the thing is it has a lot of staging. And you  
9 have energized equipment on both sides. So you need  
10 to essentially take some bus outages. So it is  
11 significantly time-consuming.

12 CHAIRMAN WALLIS: Yes, but you don't have  
13 to dig it out?

14 MR. KOSHY: Unless it is direct buried  
15 cable.

16 MEMBER BONACA: In fact, I mean, for  
17 example, yesterday during the review of Monticello,  
18 the majority of their underground cable, they're  
19 buried.

20 CHAIRMAN WALLIS: Those are usually  
21 utility duct or something, in other words.

22 VICE CHAIRMAN SHACK: This is direct  
23 buried.

24 CHAIRMAN WALLIS: Direct buried cable?

25 MR. KOSHY: Those are not exceptions.

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1 Usually you will have a duct bank with some sleeves in  
2 there so that you can pull through it.

3 MEMBER BONACA: And it depends on the age  
4 of the plant. I mean, Monticello is an older plant.  
5 They buried it, and that was it.

6 MR. KOSHY: So you have a wide variety on  
7 those?

8 MR. MORRIS: Tom, George Morris, EEEB.  
9 Some of the original cables that were pulled through  
10 duct bank, all of the original cables that were pulled  
11 through duct bank, were pulled through with the use of  
12 cable lubricant to reduce the friction. After they  
13 had been in there for a while, that lubricant has  
14 dried up.

15 MEMBER BONACA: It doesn't work.

16 MR. MORRIS: In some cases, it's almost  
17 like concrete.

18 MR. KOSHY: Okay. Moving on to some  
19 examples, Ocone is a success story where they found  
20 that two of the six cables had significant  
21 degradation. And they were able to monitor it and  
22 take the outage at a convenient time so that they can  
23 replace them.

24 Another example I am using here is Peach  
25 Bottom. When they experienced a failure, they decided

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1 to make a global replacement. You know, they didn't  
2 want to do any testing at all. And that's also a  
3 solution.

4 CHAIRMAN WALLIS: Now, is it always water  
5 that leads to degraded cables? It seems to me that  
6 you could have a cable and a duct which might just --  
7 you know, the insulation can over a period of time  
8 oxide or whatever it does. I mean, even in your house  
9 without water, you get cables that --

10 MR. KOSHY: Yes.

11 CHAIRMAN WALLIS: The insulation cracks  
12 and so on.

13 MR. KOSHY: This has some influence in the  
14 sense if it is a dry insulation and there is only  
15 cracks, chances are it will survive a little longer.

16 CHAIRMAN WALLIS: That's right, but it may  
17 --

18 MR. KOSHY: The presence of chemicals --

19 CHAIRMAN WALLIS: Makes it work.

20 MR. KOSHY: -- create default.

21 CHAIRMAN WALLIS: It's not essential that  
22 you have moisture, is it?

23 MR. KOSHY: Right. You're right. We are  
24 not trying to look at the root cause of what causes  
25 the failure. We are more interested in seeing,

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1       irrespective of the causes, let's have a program in  
2       place so that we can prevent such unanticipated  
3       failures and have a great confidence in the accident  
4       mitigation capability. So that's the focus we are  
5       trying to get because for --

6                   CHAIRMAN WALLIS: There is no routine  
7       measurement of, say, resistance of ground of a cable?  
8       There is no routine --

9                   MR. KOSHY: There is some technology  
10      developing that way, but online systems have not been  
11      doing that well. I think the industry is headed that  
12      way and there is some aggressive effort in the  
13      industry for coming up with something like that or,  
14      rather, building confidence in the systems that are  
15      now under development.

16                   Oyster Creek is an example where they  
17      replaced the cables and they had few repeated  
18      failures. This design is also unique. They  
19      essentially had this cable going about 200 feet away  
20      from the main plant as an extension of the safety bus.  
21      And this is remaining energized all the time. And  
22      that earlier had several failures.

23                   So the information that we are requesting  
24      is provide to us a history of the cable failures in  
25      the scope that I discussed just before and a

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1 description and frequency of the inspection, testing,  
2 and the monitoring programs in place. And if you do  
3 not have a monitoring program in place, explain to us  
4 why such a program is not necessary. So that is  
5 essentially what we are asking in --

6 CHAIRMAN WALLIS: So this is really  
7 information gathering. This isn't requiring an  
8 action?

9 MR. KOSHY: Right, right.

10 VICE CHAIRMAN SHACK: Now, are you  
11 distinguishing between a monitoring program and a  
12 functional testing program here?

13 MR. KOSHY: Okay. The explanation that we  
14 have given, in fact, I am addressing as a response to  
15 a public comment, what we are saying is the functional  
16 testing that you do that you energize for a short  
17 period doesn't give you any confidence that it will do  
18 it again.

19 VICE CHAIRMAN SHACK: Okay. So you're not  
20 counting that as a monitoring program?

21 MR. KOSHY: Yes. We are not.

22 MEMBER SIEBER: A surveillance test.

23 MR. KOSHY: These are the organizations  
24 that have given response to the first version that  
25 went out for public comments. And I will address the

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1 highlights of how we addressed those comments.

2 Cable failures are random. And,  
3 therefore, no NRC action is required.

4 CHAIRMAN WALLIS: It sounds like saying  
5 they're an act of God or something.

6 MR. KOSHY: Yes. We just explained the  
7 surveillance activity, which wouldn't give you  
8 confidence on its future performance. You need to in  
9 some way monitor the condition of that insulation so  
10 that we can build that confidence.

11 Again, you know, this is the small group  
12 of cable where you have this problem. Otherwise, the  
13 rest of the cable is in a dry environment. Next to  
14 selectable sealed-in concrete, you know, these cables  
15 should be the most reliable piece of equipment in a  
16 plant, you know, should not be failing for about 40  
17 years or, in fact, for 60 years, you know, if it is  
18 the environment and the conditions are right.

19 And I quickly explained before that the  
20 low-voltage cables are included because some of the  
21 early vintage plants have this 480-volt equipment for  
22 safety buses, diesel, and naturalized emergency  
23 service water, and service water equipment.

24 CHAIRMAN WALLIS: The original sentence is  
25 garbled. It doesn't matter. Essentially we have a

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1 period after impact, and that's all right. Scope is  
2 limited.

3 MR. KOSHY: Okay. Again, we just  
4 addressed this issue, why this basic surveillance  
5 tests of operating for a half an hour or two hours  
6 wouldn't be sufficient to gain that confidence for --

7 CHAIRMAN WALLIS: What you do is you put  
8 on them the voltage that they would have in operations  
9 and --

10 MR. KOSHY: No. You actually energize a  
11 --

12 CHAIRMAN WALLIS: Do you actually have to  
13 have current going? Do you have to current going  
14 through these cables to test them or does it have the  
15 voltage applied to them and see if there's a leakage?

16 MR. KOSHY: Yes. There are about eight or  
17 ten techniques in the industry.

18 CHAIRMAN WALLIS: There's a whole lot of  
19 techniques.

20 MR. KOSHY: Yes, yes. And the thing is  
21 the early technique was just apply very high voltage  
22 and make it fail. That was the most crude way of  
23 doing it.

24 MEMBER SIEBER: Meggering.

25 MR. KOSHY: Meggering is another method,

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1 but that has certain weaknesses, too.

2 MEMBER SIEBER: You have reflective  
3 techniques.

4 MR. KOSHY: Yes. Time domain reflects  
5 III, and about six or eight techniques are there. And  
6 there are still some under development. Collectively  
7 you have about two IEEE standards that go into details  
8 of the type of tests available and the level of  
9 confidence that you have based on the type of cable.

10 So depending on if you have a shield and  
11 what kind of shield and what type of rubber material  
12 is used, the level of confidence is different, you  
13 know, depending on the type of test that you do.

14 So there is some industry that two IEEE  
15 standards are available to address that and which one  
16 is better and which one is desired.

17 MEMBER SIEBER: You can get some pretty  
18 high voltages in these cables from switching  
19 transients.

20 MR. KOSHY: That's true.

21 MEMBER SIEBER: It will go well beyond the  
22 rating for a very brief period of time. And sometimes  
23 that's when the insulation fails.

24 MR. KOSHY: Yes.

25 MEMBER BONACA: By "surveillance test,"

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1 you mean surveillance of the equipment and this power  
2 by the cable?

3 MR. KOSHY: Right. You are giving normal  
4 voltage and normal function of a couple of hours, you  
5 know, like in the pump in service inspection or type  
6 of surveillance you will expect to run in for two or  
7 three hours, make sure it is for using the rate of  
8 flow and things like that. That's the type of test  
9 that will not give you a feeling of how good the  
10 insulation is. Will it last for the next two weeks of  
11 runoff?

12 The regulatory basis for our cable  
13 monitoring is we have added that what is seen in bold,  
14 that condition is something that we really did not  
15 have in the first version. And we are essentially  
16 saying that "assess the continuity of the systems and  
17 the condition of the components." So you need to know  
18 the condition of this insulation so that we can have  
19 that confidence on its performance.

20 MEMBER ARMIJO: Could you expand that?  
21 Condition based on electrical properties? Are you  
22 actually looking for physical condition? They're in  
23 accessible.

24 MR. KOSHY: These are inaccessible, but  
25 you do have state-of-the-art techniques available in

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1 electrical testing which will measure the testing of  
2 the insulation.

3 MEMBER ARMIJO: Okay.

4 MR. KOSHY: So if you can establish that  
5 the integrity of the insulation is reasonable, then  
6 you have that confidence that it will not fail in the  
7 most probable cases.

8 MEMBER ARMIJO: Thank you.

9 MR. KOSHY: The question was regarding  
10 multiple cable failures. The only example that we  
11 have collected in light of our efforts is a case where  
12 one insulation failure was in the circulating water  
13 pump, resulted in taking two other substations out  
14 with it.

15 The possibility that we are talking of is  
16 the fault itself causes a transient and sends some  
17 transient current. And if you have some near-failure  
18 equipment, that can be a cause for additional  
19 failures. You know, these are speculative problems.  
20 And this is the only example that we have on record  
21 for that.

22 Now, the modifications that we have done  
23 in light of the comments on this are editorial in  
24 nature, a good part. We revised the scope to include  
25 the above-ground and below-ground duct banks; removed

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1 the broadband spectroscopy because that's not a proven  
2 technique yet, but, again, that could be a technique  
3 available in the future; revised the requested  
4 information to include the type of service so that we  
5 will be able to know if there are repeated failures in  
6 a certain area. And we revised the data collection  
7 time to 60 hours.

8 CHAIRMAN WALLIS: So it would seem that  
9 there is still a gap between your view and the  
10 industry's view.

11 MR. KOSHY: Yes.

12 CHAIRMAN WALLIS: The industry had some  
13 pretty strong comments. And your modifications don't  
14 reflect large changes in response to their comments.

15 MEMBER SIEBER: Right.

16 CHAIRMAN WALLIS: So there would seem to  
17 be still a big gap between your view and the  
18 industry's view. Is that true?

19 MR. KOSHY: I will address that in the  
20 next slides along with the NEI white paper issues, in  
21 slides 16 and 17.

22 CHAIRMAN WALLIS: Okay.

23 MR. KOSHY: We presented this to CRGR.  
24 And CRGR asked us to do two improvements on the  
25 generic letter: to bring the focus on the power

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1 cables itself and also to add a safety-related example  
2 to show the significance of this failure on a plant.  
3 In the package that you have received, we have  
4 incorporated those changes.

5 We received the NEI white paper much after  
6 the comment period on May 1st. I have addressed the  
7 highlights in this coming couple of slides. One is a  
8 graded approach. Again, the number that you see on  
9 the top is the sections that correspond to the NEI  
10 white paper, 6.6.

11 The graded approach for monitoring and  
12 replacement of cables, the bullets are many cables do  
13 not power safety-related equipment; and the other one,  
14 graded approach to replacement and monitoring is best  
15 for safety and business reasons.

16 Our response is that we are only focusing  
17 on those that are significant. That's the very reason  
18 that we are using to bring the scope down to the  
19 maintenance rule. And we mentioned certain systems in  
20 there because to, let's say, overcome the variances  
21 and interpretations on that rule and also because  
22 those examples that we state there are the ones that  
23 have most impact on the plant in the sense affecting  
24 multiple systems.

25 Therefore, these are classified as most

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1 important because of these reasons. And, therefore,  
2 you know, it will be important to prevent the  
3 transients and also in supporting of mitigating the  
4 accident.

5 So that's how we have narrowed the scope  
6 and as to bringing down to only important cables and  
7 not all of the cables at large. And the numbers that  
8 you see in that white paper are some plants have like  
9 300-plus cables. And that won't be within the scope  
10 of maintenance rule.

11 The next one, the recommendations again in  
12 chapter 8, is provide dry environment, prepare for  
13 cable failures, and share failure resolutions.

14 Providing a dry environment -- again, you  
15 know, these are all installed cables. It's not quite  
16 practical. And pumping out would help. It will slow  
17 down the failure, but it cannot prevent the failure.  
18 It may take a little longer. And these cable failures  
19 could affect many systems. And the replacement of  
20 these cables is very time-consuming.

21 So if you have a valid accident mitigation  
22 method and at that time trying to make this cable  
23 replacement could be very difficult because the cables  
24 that run in the same duct banks could be helping the  
25 accident mitigation at that time. And your cable

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1 pulling and taking bus outages would not be desirable  
2 actions when you run into an accident environment or  
3 facing a LOOP or a station blackout.

4 And the technique is available there to  
5 have that reasonable confidence so that we can rely on  
6 these cables for continued operation.

7 That's all we have prepared for presenting  
8 to you. And if you have --

9 MEMBER BONACA: I have a question --

10 MR. KOSHY: Sure.

11 MEMBER BONACA: -- regarding in the  
12 generic letter, you talk about 23 LERs --

13 MR. KOSHY: Right.

14 MEMBER BONACA: -- and two monitor  
15 reports. Then the letter says that you believe that  
16 this is a very small fraction. That is the word used  
17 in the LER in the generic letter, a very small  
18 fraction of the actual failure to take place, which  
19 tells me that the number of failures that happen may  
20 be in the hundreds.

21 What is the projection? What does it mean  
22 that 25 in total is a very small fraction?

23 MR. KOSHY: It's very difficult to make  
24 such an estimate, but let me give a personal  
25 experience that I know of. I was at an AIT for a

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1 plant where they had such a cable failure. At that  
2 time they had six cable failures already when we had  
3 the AIT in the mid '80s. So that is repeated failures  
4 happening at one plant.

5 MEMBER BONACA: Okay.

6 MR. KOSHY: Again, I know of another  
7 Northeastern plant where they have all of these  
8 service water cable and emergency service water cables  
9 going through manholes. And they had splices in that  
10 also. And this manhole gets filled with water. And  
11 when the manhole cover knocks out, that's when you  
12 find out the splice failed. They had also quite  
13 repeated failures.

14 So certain plants may have a higher  
15 susceptibility because of groundwater and the design  
16 uniqueness. There may be some plants in absolutely  
17 dry environment, like WNP 2 in the middle of the  
18 desert. They may not have any cable problems because  
19 it's always dry. and if it all drains, it dries out  
20 so fast. So some plants may be fully exempt from this  
21 problem.

22 If the water table is a guide, those are  
23 the ones where you have high susceptibility and  
24 failures. And some plants are kind of glaringly  
25 different than others.

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1                   MEMBER BONACA: The information you are  
2 requesting is regarding all cables, right, not only  
3 those in a weather condition?

4                   MR. KOSHY: All cables and inaccessible.

5                   MEMBER BONACA: Inaccessible.

6                   MR. KOSHY: Yes.

7                   MEMBER BONACA: Exactly. Okay.

8                   MR. KOSHY: So plants where they did not  
9 have failures would not have anything to report. But  
10 if you had failures, we would like to know them --

11                   MEMBER BONACA: Yes.

12                   MR. KOSHY: -- so that we can kind of  
13 gauge, you know, are there repeated problems, what are  
14 the vulnerabilities, and based on that probably share  
15 the lessons and see if you have to take further  
16 action. Maybe it's down to a few plants. We do not  
17 know that because we lack the data to support that.

18                   And the NEI white paper data shows about  
19 15 plants having about 45 to 50 failures. That could  
20 be an indication because they focused on underground  
21 and medium voltage only.

22                   MEMBER BONACA: But your monitoring  
23 program that you're talking about doesn't deal only  
24 with cables that failed. It deals with cable aging  
25 that may be operable during functional testing that

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1 failed during demand, service.

2 So how are you going to gather information  
3 regarding these kind of cables?

4 MR. KOSHY: Okay. What we are saying is  
5 if those cables are within the scope of maintenance --

6 MEMBER BONACA: Yes.

7 MR. KOSHY: -- and they're underground and  
8 inaccessible, tell us if you have failures. And do  
9 you have a program when they have this susceptibility  
10 for failure to make sure that it wouldn't fail?

11 MEMBER BONACA: I understand.

12 MR. KOSHY: So you're not on the scope.  
13 Tell us what the failure is. And see how you monitor.

14 MEMBER BONACA: Right.

15 MEMBER ARMIJO: I have a question. How  
16 can you have a failure of above-ground inaccessible  
17 cable without water? Is it --

18 MR. KOSHY: Okay. What happens is, you  
19 know, even in some large conduit connections which go  
20 on the surface because of the variance, you get  
21 condensation built in there unless you have a way of  
22 venting it out.

23 MEMBER ARMIJO: Well, it could be a  
24 significant amount of water.

25 MR. KOSHY: You could collect all the

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1 time.

2 CHAIRMAN WALLIS: You get a humid day and  
3 a cold night.

4 MR. KOSHY: For the condensation and --

5 MEMBER SIEBER: You can get cable failures  
6 from things other than water.

7 MR. KOSHY: Yes, other chemicals and other  
8 leeching, yes.

9 MEMBER SIEBER: Chemicals, overheating.  
10 You know, that degrades insulation or defect in  
11 splices, for example, if --

12 MR. KOSHY: Yes. Splices is another  
13 vulnerable point.

14 MEMBER SIEBER: It's handmade.

15 MEMBER MAYNARD: A couple of questions.  
16 On the provided inscription of the frequency of all  
17 inspection testing, monitoring, are you talking about  
18 what is currently in place or are you asking the  
19 licensee to go back to day one for all of what testing  
20 has been done?

21 MR. KOSHY: We are asking for what you  
22 have in place now so that you can put in place such  
23 unanticipated failures.

24 MEMBER MAYNARD: Okay. And the other  
25 thing is, is the staff coordinating in any way? This

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1 is requesting this information to be within 90 days.

2 MR. KOSHY: Right.

3 MEMBER MAYNARD: And it would appear to me  
4 that if the other generic letter on the spurious  
5 actuation gets issued, a lot of the same resources  
6 could be required or needed for a lot of these  
7 activities, both dealing with electrical circuits,  
8 just --

9 MEMBER SIEBER: This one is pretty --

10 MR. KOSHY: We will work with the Generic  
11 Communications Division so that we would be sensitive  
12 to that.

13 CHAIRMAN WALLIS: So what are you going  
14 with the information when you get it?

15 MR. KOSHY: What we are hoping is that  
16 depending on, let's say, the breadth and depth of the  
17 problem as to why widespread, we may have to think of  
18 NRC action if that warrants it. We have --

19 CHAIRMAN WALLIS: You think that there  
20 might be some problem. You have this sort of you  
21 almost call it a fishing expedition, where you get all  
22 of this information. And then you look at it and say,  
23 "Aha. Now we have to do something or not." You're  
24 not quite sure what you are going to find.

25 MR. KOSHY: Okay. We know it is a

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1 significant problem in the light of what I explained  
2 to you.

3 CHAIRMAN WALLIS: There have been events,  
4 right.

5 MR. KOSHY: Yes. We have been having  
6 events, which either the plant is out or disabled  
7 safety systems. And those things kind of give you a  
8 flavor of significance.

9 CHAIRMAN WALLIS: But the result of all of  
10 this information gathering might be that you decide  
11 everything is okay as it is now.

12 MR. KOSHY: If the industry has, let's  
13 say, commitments to prevent such failures, yes. But  
14 if you are seeing failures and repeated failures, we  
15 have to rethink what we should be doing. Okay? We  
16 are not there yet. We need to --

17 MR. MAYFIELD: Professor Wallis, this is  
18 Mike Mayfield from the staff. As we assess the  
19 results we get back from this, we would have to make  
20 a decision whether generic action is warranted or is  
21 there some plant-specific action that is warranted or  
22 things are being managed appropriately as it is. And  
23 we just don't know until we get the results back. We  
24 have enough indicators to make us believe that we need  
25 to go --

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1 CHAIRMAN WALLIS: I think the industry  
2 response to the public comments was everything is  
3 fine, we're doing the right thing now. You just want  
4 the assurance that it really is so.

5 MR. MAYFIELD: That might be the outcome.  
6 And we'll have to see what actually comes in.

7 MEMBER SIEBER: The third question sort of  
8 tips your hand as to what you want. And it says if a  
9 monitoring or surveillance program is not in place,  
10 explain why such a program is not necessary.

11 In other words, here's a plant with  
12 failures. And they're not testing anything.

13 MR. MAYFIELD: We might want to chat with  
14 them a bit.

15 MEMBER SIEBER: You gave them the hint.  
16 You ought to test something.

17 MEMBER BONACA: Or you may have a plant  
18 where there have been no failures and you have no  
19 significant power equipment. Then why should you even  
20 have a test? I mean, then you have a threshold for  
21 saying, "We don't need it."

22 MEMBER MAYNARD: I've got a feeling when  
23 you get all of this, the actual number of failures if  
24 you divide it by the number of plants and the number  
25 of operating years wouldn't look that great, but when

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1 you go to group them, there may be some areas where  
2 you --

3 MR. MAYFIELD: Exactly. And that is not  
4 an uncommon outcome from getting this kind of  
5 information.

6 MR. KOSHY: One thing you find out is the  
7 data that we have at this time is based on normal run  
8 and surveillances, not an extended use of like two,  
9 three weeks. So what we are trying to see is gain  
10 confidence that these cables can continue in service  
11 for two or three weeks if there is a station blackout  
12 or some reason and we can continue to rely on these  
13 cables for that safety function.

14 MEMBER BONACA: Yes. That is a very  
15 important issue, you know, the failure to run. So the  
16 equipment starts, but then it won't run for as long as  
17 it has to. And that's trickier because, I mean, the  
18 number of failures experienced to date doesn't give  
19 you a specific insight on these cables. And that's  
20 their function.

21 MR. KOSHY: Right.

22 MEMBER BONACA: Any additional questions?

23 (No response.)

24 MEMBER BONACA: If not, I thank you for  
25 the presentation.

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1 MR. KOSHY: Thank you.

2 MEMBER BONACA: I think Mr. Marrion of NEI

3 --

4 MR. MARRION: Yes.

5 MEMBER BONACA: -- would like to make a  
6 statement. NEI, of course, produced that white paper  
7 that is quite interesting on this issue.

8 MR. MARRION: Good afternoon. I'm Alex  
9 Marrion, the Senior Director of Engineering at NEI.

10 I do have a couple of comments I want to  
11 make about basically what we heard. We haven't seen  
12 the staff disposition of the public comments that have  
13 been submitted. Nor have we seen the current version  
14 of the proposed generic letter.

15 But I have to tell you I am confused. And  
16 the reason for that confusion is that a couple of  
17 years ago, I received a letter from the Electric  
18 Systems Branch Chief articulating concern with a  
19 potential common mode of medium voltage cables. And  
20 the common mode failure mechanism was water training.  
21 This was based upon a review of 20-some odd licensee  
22 event reports.

23 We had a public meeting with the staff to  
24 understand, get a little more of an understanding of,  
25 their concerns. And we looked into the licensee event

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1 reports, and they had -- I'm trying to remember. I  
2 think there was only one or two that had a potential  
3 for being related to the water-training phenomenon  
4 that the staff was concerned with.

5 But it became clear to us that we needed  
6 to develop a document that would be an educational  
7 piece, if you will, primarily focusing for the  
8 industry, but we also felt that the NRC could possibly  
9 benefit from it. And that was the basic objective for  
10 the white paper that we developed.

11 The purpose for the educational piece was  
12 to articulate a clear understanding of the  
13 water-training phenomenon to articulate our assessment  
14 of the licensee event reports that the staff was using  
15 as a basis --

16 CHAIRMAN WALLIS: You're talking about a  
17 water-training phenomenon?

18 MR. MARRION: Water training, yes.

19 CHAIRMAN WALLIS: Training. Oh, I'm  
20 sorry.

21 MR. MARRION: Yes, water training. I'm  
22 sorry. I've got a cold, and I'm a little congested.  
23 I apologize.

24 CHAIRMAN WALLIS: That's my  
25 misunderstanding. I'm sorry.

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1 MR. MARRION: -- and also provide us a  
2 technically based understanding of the application of  
3 that phenomenon to basic cable configurations and  
4 insulation systems that exist in the power plants  
5 today or not in the power plants but exist in these  
6 applications today.

7 We concluded that you can't make a general  
8 statement that water training is of concern because  
9 it's not applicable to every cable configuration and  
10 insulation system that's in the field today.

11 It appears that the staff is attempting to  
12 require a cable-monitoring program. I'm not familiar  
13 with the details of the maintenance rule, but I know  
14 that the equipment to which these cables are  
15 terminated are monitored in the maintenance rule.

16 And since the cables aren't active  
17 components, I'm not sure whether they should be  
18 included in the maintenance rule or not. But  
19 fundamentally if the staff expectations and basis in  
20 this generic letter are not clear, you have the  
21 potential of a generic letter basically undermining a  
22 regulation.

23 I don't know if the staff has done a  
24 review with the maintenance rule folks within NRR, but  
25 I would recommend that be done before this is

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1 submitted.

2 CHAIRMAN WALLIS: You're implying this,  
3 but, in fact, they just say they're gathering  
4 information. And it's not clear that they intend to  
5 do anything which would change the regulation in any  
6 way or interfere with regulation. You don't know what  
7 they're going to do.

8 MR. MARRION: And the licensee has to  
9 document a justification of why they don't have a  
10 cable-monitoring program. That is --

11 CHAIRMAN WALLIS: But you're implying that  
12 something downstream is going to require this. That's  
13 not actually a --

14 MR. MARRION: No. I'm implying there may  
15 be a conflict between what the generic letter is  
16 asking for and what is required by the --

17 CHAIRMAN WALLIS: You're asking for  
18 information, rather.

19 MR. MARRION: Well, okay. That's one way  
20 of looking at it. It is a request for information or  
21 an attempt to require a cable-monitoring program. And  
22 I'll let you folks decide how you want to do that if  
23 they want to interpret that.

24 I think that, you know, the staff has made  
25 some comments about, you know, what their concern is.

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1 And it's not clear to me. I have to tell you I'm  
2 confused. Maybe it's because of our involvement over  
3 the past several years, but I have yet to see any kind  
4 of risk analysis or any kind of statistical analysis  
5 conducted by the NRC to articulate some level of  
6 confidence that they find unsatisfactory relative to  
7 the performance of the cable or the equipment.

8 We have attempted to do some statistical  
9 work in our white paper based upon the survey that we  
10 had conducted. I'm not happy with the fact that we  
11 didn't get 100 percent of the utilities to respond,  
12 but we got on the order of 80 percent, I think, 79.  
13 something. That has some benefit.

14 My concern at this particular point is  
15 when the generic letter is finally issued, based upon  
16 what I heard this afternoon, we're going to have to  
17 request a meeting, a public meeting, and probably  
18 document further clarification of what the NRC is  
19 really interested in this information request as they  
20 go forward because it's not clear at this particular  
21 point in time. And that's all I have to say. I would  
22 be more than happy to answer any questions you may  
23 have.

24 (No response.)

25 MR. MARRION: Okay. Thank you.

1 CHAIRMAN WALLIS: You're welcome.

2 You were suspicious that if they gather  
3 this information, then they might use it to require  
4 something which they wouldn't be able to do if they  
5 didn't have the information?

6 MR. MARRION: No. It's not clear what  
7 concern is trying to be addressed by the request for  
8 information.

9 CHAIRMAN WALLIS: Well, the concern is  
10 that these cables will fail. It's a simple concern.

11 MR. MARRION: Well, where does that  
12 concern stop? Do you stop at these cables or do you  
13 continue that concern at the equipment, et cetera,  
14 that is under continuous surveillance programs and  
15 testing? I mean, where does it end?

16 And it's a concern about having possible  
17 unanticipated failures? Well, where do you stop  
18 asking that question now that you started on medium  
19 voltage cables and the small population of medium  
20 voltage cables, I suspect?

21 So there are some real issues that have to  
22 be addressed here because the utilities are going to  
23 want to be responsive to the generic letter. My job  
24 is to make sure that we understand it adequately so  
25 the utilities will be responsive, but right now I'm

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1 not sure we have that understanding.

2 MEMBER BONACA: Well, if I understand it,  
3 I mean, the issue has to do with two things. One is  
4 inaccessible equipment that cannot be visually or  
5 other means inspected -- so it's a very narrow family  
6 -- and then equipment that is really in accepted  
7 applications.

8 And clearly equipment is seeing a water  
9 condition or wetness that -- so it's a pretty unique  
10 and narrow population, but I think at least I am  
11 interested to know what kind of equipment is being  
12 powered by this kind of cable out there. And if it is  
13 something critical, a generic letter or whatever,  
14 connection to off-site power, you know, it's a unique  
15 concern.

16 I mean, we addressed it and discussed it  
17 during license renewal because it was significant.  
18 And the industry and the NRC worked together on a goal  
19 inspection program for those cables.

20 And where does the aging start? I mean,  
21 does it start with a theatre of operation or does it  
22 start before? Clearly there is degradation taking  
23 place at some point. I realize I don't know all there  
24 is necessary to know about that.

25 MR. MARRION: If I may just offer a couple

1 of comments?

2 MEMBER BONACA: Yes?

3 MR. MARRION: The aging phenomenon begins  
4 from the time that the cable is shipped from the  
5 manufacturer's facility.

6 MEMBER BONACA: That's right.

7 MR. MARRION: And it's exacerbated by  
8 environmental conditions as well as operational  
9 conditions that wind up stressing the cable insulation  
10 system. And a submerged, wetted environment for  
11 certain insulation systems has the potential of  
12 increasing the aging or the rate of aging degradation,  
13 et cetera. That is well-known.

14 The equipment that's affected here  
15 includes diesel generators at some plants at 4,000 or  
16 4,160 volts as well as other plants at 6.9 kV. I  
17 don't know about -- I think one of the staff was --  
18 Tom made a comment about some diesel generators  
19 operating in the 480 volts. If that's indeed the  
20 case, then that's indeed the case.

21 But mean voltage cable in the industry is  
22 characterized as 2,000 to 15,000 volts. So I'm hoping  
23 that the generic letter will be very clear of  
24 articulating the 480-volt applications. And is it  
25 only for that particular piece of equipment or is it

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1 for something else? That's one of the points of  
2 clarity that's needed.

3 We tried to capture in our white paper --  
4 and I hope you've read it; we've made it available to  
5 you -- the current state of understanding of cable  
6 insulation systems at this voltage level and  
7 underground applications and which insulation systems  
8 are susceptible to water damage over time.

9 We have encouraged the utilities to  
10 prepare for such failures because if you look at the  
11 age of the fleet, we are approaching the end of  
12 service life of a lot of these cables. It's typically  
13 30, 35, 40 years based upon normal environmental  
14 conditions.

15 And our recommendation to the industry was  
16 don't wait for a failure before you have to deal with  
17 this problem because this is not the kind of cable  
18 that you typically keep large quantities in inventory  
19 at the warehouse, et cetera. And if you're not  
20 prepared, you will have an extended outage should you  
21 have such a failure.

22 I don't know if the generic letter is  
23 going to speak to that, but I also know that there is  
24 not a cable-monitoring system that is applicable and  
25 effective and available to the utilities today.

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1           There are some testing techniques that are  
2 effective for certain kinds of insulation  
3 configurations. And our white paper speaks to that.  
4 But based upon the information I have gotten from  
5 EPRI, who is pursuing research in this area, et  
6 cetera, that there isn't one technique that would be  
7 useful. So okay?

8           MEMBER BONACA: Thank you.

9           MR. MARRION: Thank you.

10          MEMBER BONACA: Yes. I think we're  
11 scheduled for some closing remarks. Is there?

12          MR. MAYFIELD: Just very briefly. We  
13 believe we have articulated why we need the generic  
14 letter. If indeed there is substantive confusion or  
15 misunderstanding once we have published the generic  
16 letter, we would, as always, be more than willing to  
17 meet with the industry and make sure that there is a  
18 common understanding of what we're asking for.

19                 This generic letter has been in process  
20 for a while. And we do believe we need to move  
21 forward to get the generic letter published and allow  
22 licensees the opportunity to engage with it. We will  
23 be mindful of any conflicts with other generic  
24 communications that are going forward where we may be  
25 imposing unreasonable time constraints and resource

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1 constraints on the licensees. That's something that  
2 we will pay attention to and go back and pulse with  
3 the generic communication staff and the other  
4 technical staff to make sure we're online there.

5 With that, unless the Committee has other  
6 questions for the staff, I believe we have presented  
7 to you the information that we wanted to present. And  
8 we look forward to receiving a letter from you. Thank  
9 you.

10 MEMBER BONACA: Any other questions for  
11 Mr. Mayfield?

12 MR. FALLON: I have a question. Mike  
13 Fallon with Constellation Energy.

14 For the license renewal applicants that  
15 have submitted under the GALL report, these cables are  
16 all in the scope of license renewal, have been  
17 addressed in their applications. Are they being asked  
18 to resubmit this information again?

19 MR. KOSHY: This is Thomas Koshy.

20 This generic letter will fall under the  
21 Part 50 program, in which case we are addressing,  
22 let's say, something more than what was addressed in  
23 the renewal program. So there is a need for making  
24 separate submittal to the NRC in response to this  
25 generic letter.

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1 MR. FALLON: All of the cables that you  
2 have addressed, all of the safety-related cables, are  
3 in the scope of license renewal. And whether they're  
4 480-volt or they're medium voltage, they're addressed  
5 in those applications.

6 MR. MAYFIELD: Okay. Let me comment.  
7 This is Mike Mayfield from the staff.

8 You raise a good point. It is something  
9 we will look at and make sure we're not asking you to  
10 unnecessarily duplicate information. But that is a  
11 fair question, something that we'll make sure that --

12 MEMBER BONACA: Well, I am not aware that  
13 license renewal applications have the summary of all  
14 of the failures that have taken place. We are going  
15 to get to the information.

16 MR. MAYFIELD: We don't think we are in  
17 conflict, but it's a fair question. And we'll look to  
18 make sure we are not asking an unreasonable question.

19 CHAIRMAN WALLIS: But you will be looking  
20 at plants which doesn't necessarily have license  
21 renewal in prospect.

22 Are we through with this item now or --

23 MEMBER BONACA: Are there additional  
24 questions for the staff, for industry, for us?

25 (No response.)

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1 MEMBER BONACA: If none, I think it's  
2 over.

3 CHAIRMAN WALLIS: Thank you.

4 MEMBER BONACA: And we open it up back to  
5 you, Mr. Chairman.

6 CHAIRMAN WALLIS: Now, I really am  
7 reluctant to take a break for an hour. I wonder if we  
8 couldn't work on -- is it okay, staff who is an expert  
9 on this? Can we work on Mario's letter on this issue  
10 right now on just a preliminary basis?

11 Let's go off the record and work on his  
12 letter for half an hour or an hour.

13 MEMBER SIEBER: We have to come back.

14 CHAIRMAN WALLIS: Can we do that? You're  
15 not ready? We do have a draft letter. Will the  
16 Committee agree to work on his letter? We can discuss  
17 it now, but I think we can go off the record and  
18 discuss our reaction to this generic letter and work  
19 on our letter until about 3:00 o'clock. Is that okay  
20 with the Committee?

21 So let's do that. We'll come off the  
22 record now, and we will work on this letter until  
23 about 3:00 o'clock. We'll have some discussion now  
24 off the record.

25 (Whereupon, the foregoing matter went off

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1 the record at 2:25 p.m. and went back on  
2 the record at 3:18 p.m.)

3 CHAIRMAN WALLIS: We will come back on the  
4 record, come back into session.

5 CHAIRMAN WALLIS: The next item on the  
6 agenda is, let's see now, interim staff guidance. Is  
7 that what it is?

8 MEMBER BONACA: Yes.

9 CHAIRMAN WALLIS: And I will again call on  
10 Mario Bonaca to lead us through this one.

11 MEMBER BONACA: Okay.

12 4) INTERIM STAFF GUIDANCE AGING MANAGEMENT PROGRAM

13 FOR INACCESSIBLE AREAS OF BOILING WATER REACTOR

14 (BWR) MARK I CONTAINMENT DRYWELL SHELL

15 4.1) REMARKS BY THE SUBCOMMITTEE CHAIRMAN

16 MEMBER BONACA: We have the staff here to  
17 provide us with an overview on the proposed license  
18 renewal interim staff guidance on steel containment of  
19 BWR Mark I containments.

20 We have reviewed a number of BWRs. And  
21 we have often asked the question on the status of the  
22 steel liner. And we have seen different proposals by  
23 licensees, some of them planned inspections, only  
24 metric inspections. Some of the others don't.

25 And the staff is using a successful

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1 process that has been successful in most of the  
2 license renewal applications to date, the ISG process,  
3 as a means of proposing an approach that they expect  
4 the licensees to follow regarding this particular  
5 item.

6 And so the staff has come here to give us  
7 an overview of this process and what they are  
8 proposing to do. And I will let the staff go ahead.  
9 I don't know if Mr. Gillespie or Mayfield --

10 MR. GILLESPIE: Yes. If I could, just  
11 some opening comments to put in context what Linh and  
12 Hans are going to go through. Not only did we do a  
13 couple already, but we've got something like seven  
14 Mark I's lined up in the queue. And we have a number  
15 of very controversial ones in New Jersey,  
16 Massachusetts, and Vermont, where there is actually a  
17 lot of public interest. And we had no position on the  
18 liner itself.

19 There are some caveats or I'm going to say  
20 some wiggle room in this position I'd like to  
21 highlight to the Committee by way of how the staff is  
22 approaching this because a question at the meeting  
23 yesterday at Monticello was, why is it different plant  
24 to plant if you're trying to apply a consistent  
25 approach.

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1           This is kind of an approach for the plant  
2           that's got almost like the optimum conditions, of  
3           which Monticello with their leakage control programs  
4           and some things they were doing was.

5           Browns Ferry, an earlier one, which  
6           committed to doing some other measurements, actually  
7           had an operating history of having leaks. And so they  
8           had moisture content in there. And so we actually  
9           have -- this is a minimum condition, as we would look  
10          at it.

11          And there are also some wiggle words,  
12          quite honestly, in this. And that's where it says  
13          first you have to establish a degradation rate,  
14          basically. And then if you get moisture, this  
15          basically treats moisture in the outside of the shell  
16          the same as visible accelerated corrosion on the  
17          inside.

18          And we're using the ASME code kind of  
19          enhanced inspection, but, instead of referencing the  
20          code, we described the enhanced inspection in it in  
21          case the code changes in the future.

22          So we're bringing definition to an  
23          equivalence to inside and outside indications. And  
24          there is still a lot of room on how you establish the  
25          rate and what is the credibility of the rate.

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1           And so if you have a history as a facility  
2 of having leakage and, therefore, moisture in there,  
3 then I think the Committee should expect the staff in  
4 establishing the rate in those wiggle rooms because it  
5 says if you have moisture, reestablish your rate again  
6 -- and the only way to factually reestablish the rate  
7 is likely do a UT measurement and then connect the  
8 dots again. Literally a simplistic way of looking at  
9 it is a regression line between the now additional  
10 point.

11           And so Hans in his efforts as a reviewer  
12 still has a lot of room in what are the uncertainties  
13 in establishing the rate. And it's those  
14 uncertainties which kind of differentiate one plant  
15 from another. How do you reduce those uncertainties  
16 given different operating histories?

17           And so that's really how come Monticello  
18 is different from Browns Ferry. It's strictly  
19 operating history and the uncertainty involved with  
20 known moisture leak on multiple occasions.

21           So, with that, let me turn it over to Linh  
22 because that's just kind of the context. Linh, take  
23 it away.

24           4.2) BRIEFING BY AND DISCUSSIONS WITH  
25           REPRESENTATIVES OF THE NRC STAFF

1 MS. TRAN: Good afternoon. My name is  
2 Linh Tran. And I'm the Project Manager with the  
3 Division of License Renewal. And this is Hans Ashar.  
4 He's a senior civil engineer with the Division of  
5 Engineering.

6 We are here this afternoon to present the  
7 proposed license renewal interim staff guidance for  
8 the inaccessible area of the BWR Mark I drywell  
9 containment shell.

10 The purpose of this ISG is to provide  
11 guidance to future applicants on the information that  
12 is needed to be included in the license renewal  
13 applications for addressing the inaccessible area of  
14 the drywell shell.

15 Now, the proposed ISG here does not impose  
16 any no new technical requirement. And in previous  
17 license renewal application review by the staff, we  
18 usually can obtain the information in the applications  
19 or through the request for additional information.  
20 And usually we will get the information from the  
21 applicant.

22 The information provided by the applicant  
23 is sufficient for the staff to make its determination.  
24 However, it is not the most efficient way because of  
25 the RAI back and forth. And in an effort to reduce

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1 the number of RAIs, this proposed ISG would identify  
2 the information up front, so for the future  
3 applicants, what they should include in the LRAs, I  
4 guess, to make the staff review more efficient,  
5 information such as inspection results or analysis  
6 that would help the staff make the determination  
7 whether the containment would perform its intended  
8 function for the period of extended operation.

9 Past operating experience in the Mark I  
10 steel containments indicate that when water is  
11 discovered in the bottom outside area of the drywell  
12 shell, the most likely cause could be the water  
13 seeping through the inaccessible area.

14 And in slide 10 in your handout, I have a  
15 picture of the drywell shell. It is an inverted light  
16 bulb. That indicates where the inaccessible area  
17 would be.

18 And this area is the area for the distance  
19 between the drywell shell -- did you do slide 10?;  
20 that's a picture there; yes -- where the surrounding  
21 concrete structure is too small for successful  
22 performance of visual inspection. That's the area  
23 right there. The gap is usually two inches, three  
24 inches.

25 CHAIRMAN WALLIS: You used the term

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1 "seeping." It's really any water that gets there from  
2 any reason whatsoever.

3 MS. TRAN: Correct.

4 CHAIRMAN WALLIS: And "seeping" is used as  
5 a general term.

6 MS. TRAN: Term, correct.

7 CHAIRMAN WALLIS: It may not seep. It may  
8 actually flow or --

9 MS. TRAN: Flow through, right.

10 MR. ASHAR: The area that we are  
11 concentrating on is between the shell, between the  
12 shell and the concrete in the back, in between the  
13 insulation --

14 MEMBER BONACA: No, no, no.

15 MR. ASHAR: Oh, I'm sorry. Wrong place.

16 MS. TRAN: Right. That's --

17 MEMBER APOSTOLAKIS: It is between what  
18 and what?

19 MR. ASHAR: Between the freestanding steel  
20 containment --

21 MEMBER BONACA: Between the light bulb and  
22 the --

23 CHAIRMAN WALLIS: There's a space right  
24 there.

25 MR. ASHAR: And mostly it is filled with

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1 insulation.

2 MEMBER APOSTOLAKIS: How does the water  
3 get there?

4 MR. ASHAR: Water gets into -- I'm going  
5 to explain. There are three basic sources of water  
6 that we have seen so far in the operating history.  
7 One can be called because of the -- we don't have any  
8 picture of the actual area.

9 MS. TRAN: No. This is it.

10 MR. ASHAR: This is it. In this area,  
11 there are bellows, bellows between the driver.

12 CHAIRMAN WALLIS: We saw them this  
13 morning.

14 MR. ASHAR: Yesterday you may have seen  
15 it, yes. And those bellows can crack. And then they  
16 can give a seepage into the trough, which collects the  
17 water.

18 Now, if the drain, which is supposed to  
19 drain out all the water from there, is full or is not  
20 working properly, the water can accumulate in the  
21 trough area, which has been kept just for that  
22 purpose. And it may all flow in coming to this area  
23 here.

24 CHAIRMAN WALLIS: It's lower.

25 MR. ASHAR: Because it is not showing

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1 better this particular detail, this is not good  
2 enough. Yesterday it was a very nice picture here.

3 CHAIRMAN WALLIS: But in order to refuel,  
4 you have to flood the upper region there.

5 MR. ASHAR: That is correct.

6 CHAIRMAN WALLIS: And some of that water  
7 can get down on the outside.

8 MEMBER APOSTOLAKIS: Okay. Thank you.

9 MS. TRAN: Now, in this --

10 VICE CHAIRMAN SHACK: Now, is that the  
11 only source of the water, I mean?

12 MR. ASHAR: No, no. There are two or  
13 three we found so far. Okay? One is a cracking of  
14 bellows. Second one is there is a refueling seal  
15 between the bottom of the trough, concrete trough.  
16 And there is a systematic way of draining it out  
17 through a drainage. But drain gets clogged. And the  
18 water comes through that area. It collects in the  
19 trough again and goes into between the concrete and  
20 the drywell shed.

21 Clog one is the reactor cavity wall. You  
22 have a stainless steel liner on it. And stainless  
23 steel liner gets -- they may do for any reason. And  
24 the water goes directly from concrete into that gap in  
25 between the two.

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1                   These are three reasons we have identified  
2                   so far.

3                   CHAIRMAN WALLIS:   So what clogs this  
4                   drain?   You said the drain gets clogged?

5                   MR. ASHAR:   It is because of negligence on  
6                   the part of the various --

7                   CHAIRMAN WALLIS:   Yes.

8                   MR. ASHAR:   -- not to monitor them  
9                   correctly.   Now they have come to their senses.   And  
10                  they started telling us they are monitoring, they are  
11                  doing this, they are doing that.

12                  MEMBER BONACA:   The drains are down from  
13                  the sand cushions, right?

14                  MR. ASHAR:   They are separate.   After the  
15                  water leakage, it is the sand cushion area.   Then  
16                  there are drains to -- actually, those drains were  
17                  meant for making sure the scent does not go away.   And  
18                  if it is, then they can collect them and put them back  
19                  the same.   That was the whole idea behind it.

20                  But it has been used nowadays as a  
21                  water-collecting/catching kind of a thing.   It is an  
22                  indirect function of that particular drain, but that  
23                  shows that water is coming in.   If the drains into  
24                  that room, if it shows any kind of water in the Torus  
25                  room, then it shows that there is a water leakage from

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1            somewhere up above that is getting into that area.

2                    CHAIRMAN WALLIS:  It drains into the room  
3 around the Torus?  It just drips down the wall  
4 somehow?

5                    MEMBER SIEBER:  Yes.

6                    MR. ASHAR:  The water comes from here.

7                    CHAIRMAN WALLIS:  That is a four-inch  
8 drain pipe.  It just drains down the wall?

9                    MR. ASHAR:  This is a sand pocket here.

10                   CHAIRMAN WALLIS:  Where does it go to when  
11 it drains out of that four-inch drain pipe?

12                   MEMBER SIEBER:  Onto the floor.

13                   CHAIRMAN WALLIS:  It just drains onto the  
14 floor?

15                   MR. ASHAR:  Unless they are collectors.  
16 Some people have started collecting them into some  
17 kind of a jar.  But most of them, yes, it was going  
18 onto the floor.

19                   MS. TRAN:  It goes onto the floor, yes.

20                   MR. ASHAR:  There is where they find out.

21                   MEMBER BONACA:  Now, some licensees have  
22 the drainage and some don't.  That depends on the --

23                   MR. ASHAR:  Well, some licensees have  
24 drains of the sand pocket area here.

25                   MEMBER BONACA:  Down at the low point.

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1 MR. ASHAR: Some people have drains at  
2 this area somewhere on the top of it.

3 MEMBER SIEBER: I think all of them --

4 MR. ASHAR: And if it is on the top of it,  
5 then there has to be sealing between --

6 MEMBER SIEBER: All of them have the top.

7 MR. ASHAR: -- the concrete and the --  
8 yesterday we saw in the Monticello case, it was a  
9 seal, which was a galvanized steel shield between the  
10 sand pocket area and the above area. So it prevents  
11 the water from getting in.

12 MEMBER BONACA: The had a few ounces of  
13 water, too, at some point.

14 MR. ASHAR: Yes, yes.

15 MEMBER BONACA: So they must have come  
16 also from the top.

17 MR. ASHAR: In the case of Monticello,  
18 there were no signs like that. We did not see.

19 MEMBER BONACA: There were only a few  
20 ounces of water, they said.

21 MEMBER MAYNARD: Yes, but they speculated  
22 that that water had actually come from another source  
23 because of the two or three-inch sand pipe there.

24 MEMBER BONACA: On the sand pipe there,  
25 yes.

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1 MR. ASHAR: They could explain when you  
2 ask that question.

3 CHAIRMAN WALLIS: Well, if it drains down  
4 that four-inch drain pipe, I would assume that the  
5 sand is full of water.

6 MEMBER SIEBER: Yes.

7 MEMBER MAYNARD: Right. That is not the  
8 low point.

9 CHAIRMAN WALLIS: There is a lot of water  
10 there before it drains down the pipe. The sand  
11 pocket, the sand --

12 MR. ASHAR: The sand pocket has to be  
13 sucked up completely.

14 CHAIRMAN WALLIS: The sand cushion is  
15 saturated with water first.

16 MR. ASHAR: Right.

17 MEMBER SIEBER: A number of plants have  
18 drains at the bottom of the sand --

19 MR. ASHAR: At the bottom --

20 MEMBER SIEBER: It would make more sense  
21 to --

22 MR. ASHAR: Some people have at the bottom  
23 of the sand pocket area drains with -- again,  
24 actually, it is to retain the sand inside. So that  
25 all flowing sand can be collected, but if they can use

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1 it at the --

2 MEMBER SIEBER: What is the purpose of the  
3 sand in the first place?

4 MR. ASHAR: Okay. See, this is the --

5 MEMBER SIEBER: Got a cushion?

6 MR. ASHAR: -- concrete area -- okay? --  
7 here. And this one when the shell expands under  
8 pressure --

9 MEMBER SIEBER: It is room to --

10 MR. ASHAR: -- it gives you some room to  
11 budge in.

12 MEMBER SIEBER: Expand? Okay. But the  
13 whole bottom of the shell sits on concrete? So you  
14 don't worry about corrosion below the sand?

15 MR. ASHAR: We do in some cases. We do to  
16 some extent, yes. If --

17 MEMBER SIEBER: How do you address that?  
18 You can't get to it because the top of it is concrete,  
19 too.

20 MR. ASHAR: If there is an appreciable  
21 collection of water in the sand bucket area, there is  
22 a chance that the water might have gone between the  
23 steel shell and the concrete.

24 MEMBER SIEBER: Right.

25 MR. ASHAR: But those cases, we have not

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1 found many so far except one, one case.

2 MEMBER SIEBER: You probably don't know --

3 MR. ASHAR: Yes, sir.

4 MEMBER SIEBER: -- you've got a concrete  
5 pad, a hemispherical pad, and then concrete above  
6 that.

7 MR. ASHAR: Right.

8 MEMBER SIEBER: And so there's no way to  
9 make a measurement.

10 MR. ASHAR: We know.

11 MS. TRAN: The interior.

12 MEMBER SIEBER: You can't get to the  
13 inside unless you cut the concrete out.

14 MR. ASHAR: Unless you cut the concrete or  
15 there are some new methods that have been developed in  
16 the NRC's research program, which have guided matters,  
17 but they are not yet being calibrated and haven't been  
18 used extensively by anybody.

19 So there are potential uses for those  
20 things under these examinations, but we have not seen  
21 them use it so far. We have just put one report from  
22 Oak Ridge National Lab in e-mail items so that people  
23 can look at that report and see if it is applicable  
24 for them.

25 CHAIRMAN WALLIS: Didn't someone yesterday

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1 say they actually made holes in that concrete in order  
2 to inspect?

3 MR. ASHAR: Yes.

4 MS. TRAN: Monticello.

5 MEMBER SIEBER: Next to the pedestal.

6 MR. ASHAR: Yes. They had to do that.

7 MEMBER SIEBER: But that is about as far  
8 as you can go because --

9 MR. ASHAR: That is as far as you can go  
10 right now, right.

11 MEMBER SIEBER: It's really thick in  
12 between.

13 MR. ASHAR: Yes. You can go up to here in  
14 the sand pocket area. Anything below that, if there  
15 is a --

16 MEMBER SIEBER: Of course, the sump is in  
17 there, too.

18 VICE CHAIRMAN SHACK: But typically,  
19 though, I mean, your experience is that there is no  
20 water there or that they all collect water?

21 MR. ASHAR: Typically the water has been  
22 very little. There has been water except in one case  
23 in the case of, I think it is, Dresden III, when they  
24 had to put firewater in here to extinguish a fire in  
25 the gravel area here --

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1 VICE CHAIRMAN SHACK: Well, that would do  
2 it.

3 MR. ASHAR: -- because of a summation  
4 fire. I don't know why.

5 MEMBER SIEBER: Good place to get a fire.

6 MR. ASHAR: But there was a fire there.  
7 They put a lot of water into it. And this whole area  
8 becomes soft here in the sand --

9 CHAIRMAN WALLIS: I'm interested to see  
10 when the sand gets full of water by some mechanism how  
11 it ever gets out. How does it ever get dry?

12 MR. ASHAR: With sand you --

13 CHAIRMAN WALLIS: If you had water access,  
14 suppose the bellows fails --

15 MR. ASHAR: Except the temperature --

16 CHAIRMAN WALLIS: -- water runs down.

17 MEMBER SIEBER: Aren't there drains at the  
18 bottom of this thing pushing it, right?

19 MR. ASHAR: Some have. This one is not  
20 shown here. There is a drain right here.

21 CHAIRMAN WALLIS: There is a drain there?

22 MR. ASHAR: There is a drain.

23 MEMBER SIEBER: Okay.

24 CHAIRMAN WALLIS: So that is how you draw  
25 out the sand? You just let it soak out?

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1 MEMBER SIEBER: It drips into where the --

2 MR. ASHAR: The temperature in the drywell  
3 in general in that area is close to about 130-140  
4 degrees. So it helps a little bit drying --

5 CHAIRMAN WALLIS: It evaporates the water?

6 MR. ASHAR: To some extent, not -- I mean,  
7 I have been given those explanations by various  
8 applicants, I know, what does this, but I do not  
9 believe everything they say. But --

10 CHAIRMAN WALLIS: Okay.

11 MS. TRAN: Slide five, please.

12 MEMBER SIEBER: You say the space between  
13 the concrete and the shell and the drywell is filled  
14 with insulation.

15 MR. ASHAR: Yes, there is insulation in  
16 there.

17 MEMBER SIEBER: What is it, some kind of  
18 fiber of some sort?

19 MR. ASHAR: I think so, yes. In one case  
20 we found that insulation was bad enough that it has  
21 chloride and all those contaminants. So when the  
22 water came in, it came with contaminated water. And  
23 that started accelerating the corrosion rate.

24 MEMBER SIEBER: That would do it. The  
25 insulation holds the water all up and down.

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1 MR. ASHAR: Up and down.

2 MR. GILLESPIE: Hans, I think it is  
3 important here that we're not talking in every case  
4 about any single containment.

5 MR. ASHAR: Right.

6 MR. GILLESPIE: What you have hit on is  
7 exactly what I tried to say in the beginning. The  
8 specific designs are so variant that we have really  
9 found out in doing these reviews that a Mark I  
10 containment is not a Mark I containment when you're  
11 looking at the drain details and the drain location.  
12 It's a function of the age, the AE. And, for example,  
13 Nine Mile actually put cameras up to ten-inch drains  
14 that they have and looked up in there, and it was  
15 dust.

16 And so before we assume that this thing is  
17 always full of water on everyone, there is a great  
18 variance between each unit. The design is different.  
19 And what licensees have done in the past to verify  
20 either the presence or absence of water is very  
21 different.

22 And so it's not like there is a universal  
23 answer to each one of these. Each one really is  
24 different.

25 VICE CHAIRMAN SHACK: Now, again, just on

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1 that, are all of the ones filled with insulation or  
2 are some of them actually air gaps?

3 MEMBER ARMIJO: I thought Monticello was  
4 an air gap based on yesterday's presentation.

5 MR. ASHAR: It is called air gap. I mean,  
6 in general, the terminology used is air gap.

7 VICE CHAIRMAN SHACK: But, I mean, is it  
8 typically filled with insulation?

9 MR. ASHAR: Typically it is a concrete  
10 General Electric design. It has the insulation in  
11 most cases. There might be a plant or two that may  
12 not have it available, but there might be some plants.

13 MEMBER SIEBER: You almost need it to be  
14 the form for pouring the concrete.

15 MR. ASHAR: Right, exactly.

16 MEMBER SIEBER: You need something in  
17 there to do that. Otherwise you don't have a gap at  
18 all. And one of the ways you get water down there is  
19 you have to take that refueling seal out after you  
20 refuel in order to put the drywell back together. And  
21 the process of doing that leaves a lip of water --

22 MR. ASHAR: Right.

23 MEMBER SIEBER: -- all around where the  
24 seal --

25 MR. ASHAR: Right.

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1 MEMBER SIEBER: -- used to be. It can  
2 only go down.

3 CHAIRMAN WALLIS: Now, we had a plant  
4 recently which had bulges in this realignment.

5 MR. ASHAR: I want to clarify two things.  
6 Okay?

7 CHAIRMAN WALLIS: It was Brunswick.

8 MR. ASHAR: There is a problem with the  
9 terminology. The first thing, when we talk about the  
10 drywell shell, it is a freestanding drywell steel  
11 shell. And when we talk about the liner, it is  
12 attached to concrete with some kind of anchorages.

13 And that is where we use the word "liner."  
14 But I have seen people using very loosely "drywell  
15 liner" here. It is not true. Okay? We are going to  
16 clarify the terminology in the next -- there is no --

17 MEMBER SIEBER: The one plant that has the  
18 liner, the shell, the structural member is the  
19 concrete, the subject of the code.

20 CHAIRMAN WALLIS: Yes, that's right.

21 MEMBER SIEBER: So you can tolerate some  
22 amount of corrosion as long as you --

23 CHAIRMAN WALLIS: So the liner just sits  
24 on the --

25 MEMBER SIEBER: -- maintain tightness.

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1 CHAIRMAN WALLIS: Okay. So the liner sits  
2 on the concrete, which is why it bulges.

3 MEMBER SIEBER: Just in that one plant.

4 CHAIRMAN WALLIS: This one is  
5 freestanding, this one.

6 MEMBER SIEBER: Yes.

7 MR. ASHAR: The one we are showing is a  
8 freestanding shell plus the liner.

9 MS. TRAN: Okay. Slide five. For some  
10 applications, just the information provided was  
11 included in the various sections of the LRA. And for  
12 other applications, the information was obtained to  
13 request for additional information.

14 As a result, the proposed ISG recommended  
15 that future applicants provide a plant-specific aging  
16 management program that would address the loss of  
17 material for the accessible area of the drywell shell.

18 So the recommendations that the applicant  
19 should be included in there, in the aging management  
20 program to develop a corrosion rate that is really  
21 inferred from past UT examination or establish a  
22 corrosion rate using representative samples in similar  
23 operating condition.

24 CHAIRMAN WALLIS: I would think the  
25 corrosion rate was so low that it would be difficult

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1 to measure. Really, you could say that it's less than  
2 a certain amount.

3 MS. TRAN: Less than, then. No minimum  
4 design.

5 CHAIRMAN WALLIS: That's good enough. You  
6 don't actually want them to determine what it is  
7 because you might be so low that you can't measure it.  
8 But if it's less than a certain amount, that would be  
9 acceptable, wouldn't it?

10 MR. ASHAR: In general, subsection IWE of  
11 the ASME code allows close to about ten percent  
12 allowance --

13 CHAIRMAN WALLIS: I know, but --

14 MR. ASHAR: -- some localized corrosion.

15 CHAIRMAN WALLIS: But if there is no water  
16 there, the corrosion rate may be essentially zero.

17 MS. TRAN: Correct.

18 CHAIRMAN WALLIS: And so establishing a  
19 zero thing is very difficult to do.

20 MEMBER SIEBER: Really, what you are  
21 trying to do is to determine how close you are to  
22 min wall.

23 MR. ASHAR: The min wall, right, minimum  
24 wall.

25 MEMBER SIEBER: And by plotting the

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1 reduction in thickness, you can determine when you are  
2 going to hit min wall. At that point you no longer  
3 meet the code for that pressure vessel.

4 VICE CHAIRMAN SHACK: How do I do this?  
5 Do I have to have multiple UT readings from that  
6 inaccessible portion of the shell? Can I demonstrate  
7 that mine is always dry?

8 MEMBER MAYNARD: You could develop a way  
9 that you had data from the --

10 MR. ASHAR: Two in the same location.

11 MEMBER MAYNARD: If an applicant comes in  
12 and they don't have previous data, I'm not sure how  
13 they develop a rate.

14 MS. TRAN: This is what we learned in  
15 putting this together. They will have one point at  
16 the beginning, you know, the design of the fabrication  
17 point. And then as a result of generic letter 87-05,  
18 most applicants, I mean, yes, have another data point.  
19 So when using that, they could develop some kind of --

20 VICE CHAIRMAN SHACK: Again, that is very  
21 specific. How many data points did they take when  
22 they made those UT measurements? How many locations?

23 MS. TRAN: Eighty-seven? Do you know?

24 MR. ASHAR: Yes. Generally in response to  
25 87-05, a number of -- now I have to say licensees, not

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1 applicants -- licensees have taken that kind of  
2 approach that they will look at four points in four  
3 sectors --

4 VICE CHAIRMAN SHACK: Four quadrants.

5 MR. ASHAR: -- because they don't remove  
6 the sand. They just have the sand. It's not like  
7 Oyster Creek. So what they do is they chip out the  
8 concrete in certain areas and then take the  
9 measurements and in response to 87-05.

10 And the second reading they take is two  
11 years or so after. That gives them a closer rate at  
12 the same location. It isn't delicate science that,  
13 hey, something is going on. Then they do more work.

14 VICE CHAIRMAN SHACK: Now, again, from  
15 Monticello, they don't seem to have maintained those  
16 as access ports.

17 MEMBER SIEBER: No.

18 MR. ASHAR: No, they don't. I mean, they  
19 can get to it if they have to, but they don't maintain  
20 them because they --

21 MEMBER SIEBER: That becomes another  
22 pocket for corrosion --

23 MR. ASHAR: Yes, right. It becomes --

24 MEMBER SIEBER: -- because there is  
25 moisture inside the containment.

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1 MR. ASHAR: Right.

2 MEMBER SIEBER: In the sump is actually  
3 that floor there. The sump is built into the floor.  
4 And so every loose water, amount of water, ends up in  
5 that space where the drywell liner and the concrete  
6 meet.

7 So they have to fill it up. They have to  
8 do something. Otherwise you would have a pocket of  
9 water sitting there.

10 CHAIRMAN WALLIS: I am still a little  
11 puzzled. I would think that the corrosion rate is so  
12 low that it's within the uncertainty in the ultrasound  
13 measurements.

14 MR. ASHAR: If it is low, they will report  
15 as low.

16 MS. TRAN: At least we will have --

17 MEMBER SIEBER: Carbon steel water and --

18 CHAIRMAN WALLIS: There's no water there.

19 MR. GILLESPIE: As it happens with real  
20 applicants, we're looking at corrosion rates like 17,  
21 18 ml a year in some cases.

22 CHAIRMAN WALLIS: There is water there.

23 MR. GILLESPIE: Well, yes. And people are  
24 seeing some evidence of corrosion. In another case,  
25 Nine Mile case, they did these measurements. And then

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1 they have a high-corrosion area on mild carbon steel  
2 at the water line in the Torus.

3 And what they did was they took that rate  
4 as a conservative estimate, where they know water is,  
5 and applied it to their liner and say, "Okay. We've  
6 got 38 years to go here."

7 And so people actually have come up with  
8 ways given these points and other representative  
9 carbon steel areas within their area that they do  
10 measure because they're in harsher environments and  
11 applied that as a representation to this in order to  
12 show that they could make it past the renewal period  
13 or at least until the next measurement that they might  
14 commit to take.

15 And so so far each licensee that we have  
16 had an opportunity to both finish our review or  
17 interface with so far has actually been extremely  
18 consistent with this position. And so they have  
19 actually figured out how to do it.

20 And there is other carbon steel in the  
21 Torus, actually in a wet environment, which gives you  
22 a noticeable rate, as it happens, particularly where  
23 some of the liners have blistered and bubbled, which  
24 is a whole other issue, that they can apply to this.

25 It's a conservative application. You

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1 know, if it doesn't work, then they have to do  
2 something else to convince us that the rate is okay.

3 So when we talk the nebulous philosophy,  
4 it gets harder, but I think when you get to specific  
5 plant situations, pardon the pun, but it's concrete.  
6 And so they have kind of come up with ways to use the  
7 generic point, the generic letter issue points.

8 In fact, in Vermont Yankee's case, they  
9 actually had leakage and did extra measurements  
10 consistent with the ISP, which wasn't issued when they  
11 did this some years ago. And so they have preserved  
12 those extra points.

13 And so it just happens that these plants  
14 actually have this information sitting there. They  
15 just haven't used it in this application before. And  
16 this is clarifying. We expect you to use it in this  
17 application.

18 Go ahead, Linh.

19 MS. TRAN: I guess now where degradation  
20 has been identified in accessible area of the drywell,  
21 meaning in the interior area of the drywell, the  
22 applicant should provide an evaluation that would  
23 address the condition of the inaccessible area of a  
24 similar condition or find something in the interior  
25 area. They should have an evaluation for that.

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1 Now, to assure --

2 MEMBER APOSTOLAKIS: How does one do that?

3 MR. ASHAR: Let me. The actual, this is  
4 just what we have seen.

5 MEMBER APOSTOLAKIS: That's okay. You  
6 don't have to show it.

7 MR. ASHAR: Okay. This is the requirement  
8 we set in after when we endorsed IWE, IWL into  
9 50.55(a) in the rule, that if they find something in  
10 the accessible area, they ought to go and look in the  
11 surrounding inaccessible area to see if there is  
12 anything going on.

13 A lot of PWR licensees, for example, have  
14 found that at the junction of the steel liner of the  
15 concrete containment and the concrete floor, they have  
16 moisture barriers generally. And their moisture  
17 barrier gets damaged. The borated water many times go  
18 in. And it starts corroding the inside area. It  
19 shows up a little bit on the upper side.

20 So they would do examination and find out  
21 what is going on. And they find the moisture barrier  
22 could be the culprit. They have to change the  
23 culprit. They ought to go inside. They ought to take  
24 out the corrosion.

25 So that's the reason this problem has been

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1 in about the inaccessible. In accessible area you  
2 have corrosion. You would look into the joining  
3 inaccessible area to find every --

4 MEMBER APOSTOLAKIS: You will look into  
5 the inaccessible area. That helps make it accessible  
6 or not?

7 MR. ASHAR: No. If you see some rusting  
8 or something on the --

9 MEMBER APOSTOLAKIS: You can look at it.  
10 Why isn't it accessible?

11 MR. ASHAR: No, no. The whole area is  
12 that you see something in an accessible area. And  
13 they investigate as to what is going on underneath  
14 that particular area. The basic focus in the room was  
15 the PWR containments. That is where it was found in  
16 so many of them. And still we are finding it.

17 MEMBER ARMIJO: But it is possible you  
18 could have damage occurring in an inaccessible area  
19 and have nothing in the accessible.

20 MR. ASHAR: That's quite right.

21 MEMBER SIEBER: Possible.

22 MR. ASHAR: That is why this type of --

23 MEMBER ARMIJO: Very possible. I mean,  
24 it's --

25 MS. TRAN: That is why we use accessible

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1 area as the indication for the accessible area for the  
2 augmented inspection. They have to do visual in the  
3 surface. And then if the surface area is accessible  
4 only from one side and they have to protect the wall  
5 thing by using ultrasonic --

6 MEMBER ARMIJO: I don't worry about the  
7 accessible. I just worry about the inaccessible and  
8 having no way of knowing just by looking at the  
9 accessible area. It's not a good --

10 MR. ASHAR: That is where this ISG kicks  
11 in because this ISG is focused on inaccessible area.  
12 This is one of the pointers, that if there is  
13 something going on in the accessible area, which you  
14 can see right away, then there is something going on  
15 and you will look at it.

16 MEMBER ARMIJO: That is the easy part.

17 MR. ASHAR: The ISG concentration, focus  
18 of this ISG, is the inaccessible areas.

19 MEMBER APOSTOLAKIS: But how does one  
20 suspect?

21 CHAIRMAN WALLIS: Yes, that's right. How  
22 does one suspect?

23 MEMBER APOSTOLAKIS: How do you suspect?

24 MS. TRAN: You find water or leakage on  
25 your --

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1 MEMBER APOSTOLAKIS: That is getting back  
2 to what Dr. Armijo is saying. That's not our worry.  
3 What if you don't find water? You still make some  
4 problem in the inaccessible area. Is that correct?

5 MEMBER ARMIJO: Yes, you could.

6 MEMBER APOSTOLAKIS: So how does one  
7 suspect that something is going on in the inaccessible  
8 area?

9 MEMBER BONACA: No. She says water.

10 MS. TRAN: Water is one. If you find  
11 water in the drain lines, water in the drain line, in  
12 the --

13 MEMBER BONACA: For example, if the seals  
14 -- I guess you are focusing on the seals and on the  
15 bellows, right?

16 MR. ASHAR: Right.

17 MEMBER SIEBER: The only way you can get  
18 water into the inaccessible area is to have it flow  
19 through the accessible area. So if you make a  
20 measurement in the accessible area --

21 MEMBER APOSTOLAKIS: Okay. That is a  
22 different --

23 MEMBER SIEBER: -- that gives you some  
24 kind of justification to extrapolate to the area you  
25 get.

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1 MEMBER APOSTOLAKIS: But that doesn't help  
2 much because it could have run down --

3 VICE CHAIRMAN SHACK: The water runs down  
4 and collects at the --

5 MEMBER SIEBER: Right.

6 VICE CHAIRMAN SHACK: It doesn't stay on  
7 the side of the --

8 MEMBER BONACA: That is why the real focus  
9 is the last bullet. And that's what they attempted to  
10 do, you know, to put in the seals and the bellows in  
11 the scope of license renewal. And this has been kind  
12 of debated with the industry.

13 CHAIRMAN WALLIS: This is a very weak  
14 statement, "if moisture is suspected." That's a very  
15 subjective --

16 MS. TRAN: Or detected.

17 CHAIRMAN WALLIS: If you have a suspicious  
18 nature, you would suspect it all the time.

19 MR. ASHAR: Subsection IWE in its  
20 IWE-1240, there's a number of items. This is the  
21 abbreviated form. A number of places where this could  
22 occur is very vividly described in there, IWE-1240 in  
23 the ASME code. And that is what we are invoking, but  
24 we did not write everything that is written in the  
25 IWE-1240.

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1 MEMBER APOSTOLAKIS: Now, you are really  
2 including SSCs that are identified as source of  
3 moisture and scope, source of moisture?

4 MR. ASHAR: Yes. For example, cracking of  
5 bellows.

6 MEMBER SIEBER: The refueling seal.

7 MR. ASHAR: I explained to you earlier.

8 MEMBER APOSTOLAKIS: Okay. That's what --

9 MS. TRAN: The refueling seal is not.

10 MR. ASHAR: Refueling seal.

11 MS. TRAN: So they have to put that in the  
12 scope of license renewal.

13 MR. ASHAR: This is what we are --

14 MEMBER APOSTOLAKIS: Okay.

15 CHAIRMAN WALLIS: Why don't they just  
16 require that they check the bellows for cracks  
17 routinely?

18 MR. ASHAR: It is not very easy to get to  
19 it. They can do tests. That's what they do most --

20 MEMBER SIEBER: It not the only place it  
21 can leak.

22 MR. ASHAR: Yes. And I say --

23 MEMBER SIEBER: They can leak along the  
24 edge.

25 MR. ASHAR: Yes. And this is what we want

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1 to have them in the scope of license renewal, so they  
2 maintain them in a condition where it is not leaking.

3 MEMBER MAYNARD: Well, by "suspected"  
4 here, don't you really mean if there has been some  
5 previous evidence that moisture has been there? You  
6 know, I suspect. I have a hard time dealing with what  
7 I might suspect, but I can deal with whether I have  
8 had any indications or evidence.

9 MS. TRAN: Yes. This is "suspect" or  
10 "detected" through your drain lines.

11 CHAIRMAN WALLIS: Well, if moisture is  
12 detected, now, that makes sense.

13 MEMBER MAYNARD: Yes.

14 MS. TRAN: It should be "detected,"  
15 instead of "suspected."

16 VICE CHAIRMAN SHACK: So if moisture has  
17 been detected any time in the life of this plant up  
18 until license renewal included? Is that what it says?

19 MEMBER APOSTOLAKIS: It is not really  
20 detected. Go ahead. You answered my question.

21 CHAIRMAN WALLIS: Well, just take out the  
22 "if" clause and say, "include."

23 VICE CHAIRMAN SHACK: Yes. Why not just  
24 include them?

25 MEMBER APOSTOLAKIS: I think "suspected"

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1 is broader because would that include a situation  
2 where you have seen moisture or water in a similar  
3 facility and you suspect it may happen in yours, even  
4 though you hadn't seen it? "Suspected" is broader.

5 MEMBER MAYNARD: Well, yes, but I think  
6 from a regulatory standpoint and from dealing with  
7 licensees, I think you need a little bit better  
8 definition rather than it just being somebody's  
9 opinion sitting there saying, "Well, I suspect there  
10 might be something there."

11 CHAIRMAN WALLIS: Suspected by whom?  
12 Inspector or is it --

13 MEMBER MAYNARD: Well, I like the  
14 "detected" or --

15 MS. TRAN: Detected. I think --

16 MEMBER BONACA: We had a discussion  
17 yesterday at Monticello that shows how difficult the  
18 issue is. I mean, we rely very much on subjective  
19 judgments and say, "Well, we don't think we ever had  
20 water."

21 CHAIRMAN WALLIS: You could simply say  
22 that "The ACRS suspects that there may always be water  
23 there. Therefore."

24 MEMBER APOSTOLAKIS: You guys must have  
25 had a hell of a meeting yesterday.

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1 VICE CHAIRMAN SHACK: In Monticello's  
2 case, they see no evidence of corrosion in '87, which  
3 was a fairly substantial operating period for them.

4 MEMBER APOSTOLAKIS: That's right.

5 MS. TRAN: Identified.

6 MEMBER ARMIJO: If they have good records,  
7 they have a good sound --

8 VICE CHAIRMAN SHACK: One data point.

9 MR. ASHAR: We have to draw things --

10 MEMBER ARMIJO: They don't have to do it.

11 MS. TRAN: So just to get back on --

12 CHAIRMAN WALLIS: You really fixed this  
13 up.

14 VICE CHAIRMAN SHACK: Why not just put  
15 these seals in scope and be done with it?

16 MR. ASHAR: This is what we tried to do  
17 earlier. And there is so much resistance from a  
18 number of applicants. I mean, I had to go to three or  
19 four RAIs over and above a lot of teleconferences to  
20 convince them to put this in the scope of license  
21 renewal. And so many people denied.

22 CHAIRMAN WALLIS: So now you have to  
23 convince them to suspect something?

24 MR. ASHAR: No. Now, with this ISG, if  
25 they have suspected sites, areas, then --

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1 CHAIRMAN WALLIS: But they don't want to  
2 do it anyway. They'll never suspect anything.

3 MEMBER APOSTOLAKIS: No. Presumably there  
4 will be some guidance what suspicion means.

5 MR. ASHAR: There is a guidance.

6 MEMBER APOSTOLAKIS: Yes.

7 MR. ASHAR: There is.

8 CHAIRMAN WALLIS: There must be.

9 MEMBER APOSTOLAKIS: It just doesn't say  
10 it in bullets.

11 MS. TRAN: Yes.

12 MR. ASHAR: I was looking for IWE-1240  
13 here. I don't have one.

14 CHAIRMAN WALLIS: Okay.

15 MR. ASHAR: But that is where it is fully  
16 described as to -- this is what we are invoking here  
17 basically.

18 CHAIRMAN WALLIS: You want to say  
19 something, "if there are indications of moisture" or  
20 something like that.

21 MR. KUO: If I may, Part 54 rule in the  
22 rule language in the SOC discussed this, saying if a  
23 component is in an environment that could have aging  
24 effect, say in the operating experience, anywhere in  
25 the industry or your specific plant, that there is

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1 such a degradation mechanism, degradation mechanism  
2 that could cause an aging effect, then an aging  
3 management program should be provided. That's what  
4 the Part 54 rule requires.

5 In other words, if this is a possible  
6 aging effect from the operating experience, then that  
7 is suspected. You would use the word "suspect." That  
8 happened before. We should not talk about the  
9 hypothetical aging effect, but it is an aging effect  
10 that we have seen before.

11 VICE CHAIRMAN SHACK: Right. That is why  
12 I can't understand why you can't just put the seals in  
13 scope. I mean, it's not a hypothetical event.

14 MR. KUO: Like Hans said, some people  
15 don't want to include the seal in the scope.

16 CHAIRMAN WALLIS: There are often people  
17 who don't want to do things, but you can say, "Do it."

18 MEMBER BONACA: What you want and what you  
19 get are two different things.

20 MR. GILLESPIE: I think you will find as  
21 a result of this ISG, fundamentally seals are in  
22 scope. Remember, seals and the refueling stuff are  
23 not safety basically. And so what we're doing is  
24 because of the effect of non-safety components on a  
25 safety component, we're bringing them into scope. So

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1 it's a bit indirect.

2 And so it shouldn't be a surprise that  
3 utilities don't want extra requirement on things that  
4 don't have any requirements on them now.

5 MEMBER BONACA: But, you know, one thing  
6 that we are learning from this license renewal process  
7 as we converge, it seems to me that the central issues  
8 are becoming the inaccessible or buried components  
9 that you can't look at, that you cannot measure. And  
10 that's natural because, I mean, these plants are going  
11 beyond some original design in certain components of  
12 the -- and I think that it is important that we focus  
13 on these inaccessible components and ask our  
14 questions, you know, how long can this live and what  
15 is the source of the problem. And here -- anyway --

16 MS. TRAN: Hans wanted me to read the  
17 IWE-1241, the examination surfaces, "Surface area for  
18 the typical location," "Typical location of such areas  
19 of those exposed to stand-in water, repeated wetting  
20 and drying, persistent leakage, and those with  
21 geometries that permit water accumulations,  
22 condensation, and biologicals attack." I mean, it is  
23 in the -- it tells the applicant the area.

24 Now, let's say if moisture is detected as  
25 suspected or identified --

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1 (Laughter.)

2 MS. TRAN: Now, we will agree that they  
3 found water. Okay? So they should include the  
4 component, the source of it, in the scope of license  
5 renewal. In addition, we need to identify the surface  
6 area.

7 Next slide. By implementing and  
8 augmenting inspection for the period of extended  
9 operation in accordance with the ASME section 11,  
10 subsection IWE and also for the examination shall be  
11 in accordance with section 11, subsection IWE-2500.  
12 And I did go over that a little bit earlier.

13 That means that surface area accessible  
14 from both sides should be visually examined and  
15 surface area that is only accessible from one side  
16 should be examined for wall thinning and using sonic  
17 thickness measurement method.

18 Now, after all of that, after all of the  
19 augmented inspection, the applicant should demonstrate  
20 that either corrosion is not occurring by performing  
21 those examinations or analysis to do analysis on the  
22 result or that corrosion is progressing so slowly that  
23 the age-related degradation will not jeopardize the  
24 intended function of the drywell to the period of  
25 extended operation.

1 VICE CHAIRMAN SHACK: Just how thick is  
2 this light bulb again?

3 MR. ASHAR: The light bulb? It varies.  
4 From the top, it is thinner, very thin, right around  
5 half-inch to three-quarter-inch. As you go down near  
6 the knuckle area between the sphere and the upper  
7 part, it is spherical area. It is close to about .7,  
8 .6 inches. Then it again goes down up to six inches.  
9 And then at the bottom area is about one to one and a  
10 half inches in between the sand pocket area --

11 VICE CHAIRMAN SHACK: No. But, I mean,  
12 it's 17 ml a year.

13 MR. ASHAR: Oh, yes.

14 VICE CHAIRMAN SHACK: You're going to chew  
15 that at a pretty good clip.

16 MEMBER BONACA: If you find a hole in the  
17 liner, I mean, would you suspect some moisture there?  
18 I mean, what is --

19 CHAIRMAN WALLIS: Even my chassis of my  
20 car, which is soaked in salt, doesn't corrode at 17 ml  
21 per year, does it? It's really bad conditions if  
22 you've got --

23 MR. GILLESPIE: Yes. That actually is the  
24 two worst points that a particular --

25 CHAIRMAN WALLIS: Yes, very bad --

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1 MR. GILLESPIE: -- that they reported to  
2 us. What it does do, though, is say there is  
3 operating history out there in this utility  
4 environment, that we cannot take for granted that it  
5 can't happen.

6 CHAIRMAN WALLIS: Right.

7 MR. GILLESPIE: And that's the reason for  
8 the ISG. We are not going to make the assumption  
9 because we have operating history that says it's not  
10 necessarily a valid assumption in all cases that it's  
11 going to go slow. There has been evidence of this  
12 going faster than people would have originally  
13 anticipated in the designs.

14 MEMBER BONACA: But in some cases where we  
15 have questioned the bellows, particularly the seals,  
16 if you're in seals, then the answer is always, well,  
17 we have good drainage. So you are in a quandary. I  
18 mean, what leads you --

19 MR. ASHAR: There are a number of things  
20 that tells us. The first thing, the drains are not  
21 clogged any time in the past. The second thing,  
22 visual examinations performed in the areas, it was  
23 shown there are no telltale signs of water for a  
24 number of inspections there performed. Then they had  
25 to show us at the bottom in the drain line there was

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1 no water coming out anywhere.

2 So there are so many things that they  
3 would tell us before they convince us that there is  
4 nothing going on.

5 MR. GILLESPIE: Mario, I would also say  
6 that I think this came up in Monticello's case  
7 yesterday, --

8 MR. ASHAR: Right.

9 MR. GILLESPIE: -- where they didn't take  
10 credit for it, but they actually had a primer sprayed  
11 on the outside of the inaccessible area. And other  
12 licensees have different applications of codings on it  
13 also.

14 And so it's not one thing.

15 MEMBER BONACA: Yes, I know, but --

16 MR. GILLESPIE: Aging management is  
17 accumulation of codings, time of exposure, amount of  
18 water.

19 MEMBER BONACA: And the spray on the  
20 surface was 65 or 40 years ago practically, 1965. So,  
21 you know, right. I understand.

22 MR. GILLESPIE: But the environment is not  
23 such that there is anything in there to actually cause  
24 the paint to peel off either. So there's no one issue  
25 here.

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1 MEMBER BONACA: Yes. I understand.

2 MR. GILLESPIE: It's different pieces to  
3 try to give you reasonable assurance.

4 MEMBER BONACA: In fact, yesterday at the  
5 end of the conversation, it was the lady who was  
6 performing the inspections felt confident with that.  
7 I'm sure that if you go physically and look at it and  
8 get information, you know, you can build a credible  
9 case that there is no concern with moisture. So I  
10 accepted that yesterday.

11 MEMBER ARMIJO: But a case has to be made  
12 --

13 MEMBER BONACA: Yes, it does.

14 MEMBER ARMIJO: -- with documented data,  
15 not just --

16 MEMBER BONACA: Right.

17 MEMBER MAYNARD: Is there something that  
18 is done periodically to ensure that these drains are  
19 really open, like particularly the sand point drains  
20 and stuff, that they're not plugged in some way?

21 MR. ASHAR: Now they are committing to  
22 those things. They have ensured those things, yes.

23 VICE CHAIRMAN SHACK: You'll find out when  
24 you have a leak.

25 MEMBER SIEBER: A sand pocket drain is a

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1 four-inch pipe. So they're hard to plug.

2 VICE CHAIRMAN SHACK: Yes.

3 MEMBER BONACA: I believe we have also  
4 some comments from the industry.

5 MS. TRAN: Right. Yes.

6 MEMBER BONACA: So shortly we'll get to  
7 those.

8 MS. TRAN: I am almost done. Now, if the  
9 intended function of the drywell cannot be met, the  
10 applicant can identify actions that will be taken as  
11 part of the aging management program to ensure that  
12 the integrity of the drywell would be maintained  
13 through the period of extended operation.

14 Last slide. Now, the drywell shell  
15 concern has already been addressed for the reactor's  
16 initial 40 years' licenses and relevant plants that  
17 have received a renewal license, as indicated in the  
18 left column there.

19 Now, the staff is in the process of  
20 reviewing the plants in the middle column. And the  
21 third column represented the remainder of the plants  
22 with the Mark I steel containment design.

23 Not all the plants in the third column,  
24 however, have announced their intention to renew their  
25 license, but the future review that's listed on the

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1 right side.

2 This concludes my presentation. So we can  
3 entertain any additional questions that you might  
4 have.

5 MEMBER BONACA: You don't have to request  
6 questions.

7 CHAIRMAN WALLIS: Ell, I suspect there  
8 might be some more questions.

9 (Laughter.)

10 MEMBER SIEBER: I don't know what they  
11 would be that we haven't already asked.

12 MEMBER BONACA: Any additional questions?

13 (No response.)

14 MEMBER BONACA: None. So we thank you for  
15 a very good presentation.

16 MS. TRAN: Thank you.

17 CHAIRMAN WALLIS: You have been here all  
18 day, Alex.

19 MR. MARRION: I know. Can I get one of  
20 those little name tag things? I'll just put it on.

21 (Laughter.)

22 MR. MARRION: Good afternoon. My name is  
23 Alex Marrion. I'm Senior Director of Engineering with  
24 NEI. And with me I have James Ross, who is the senior  
25 project manager with lead responsibility for license

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1 renewal. He's here to keep me out of trouble. He  
2 should have been here earlier.

3 I just want to make a couple of general  
4 comments. Based upon comments that the NRC made about  
5 the uniqueness of the specific plant designs, we feel  
6 that this is not really a generic issue, but it's  
7 appropriate to address it on a plant-specific basis in  
8 accordance with the uniqueness of the designs. And I  
9 think Frank Gillespie brought that up.

10 This is not a new issue. It's been  
11 addressed by the licensees in the past. There was a  
12 generic letter, 8705. And inspection requirements  
13 were incorporated into NRC regulations when NRC  
14 endorsed the ASME code subsection IWE as part of an  
15 update of 10 CFR 50.55(a).

16 Because that was already regulatory  
17 requirements, utilities were resisting the idea of  
18 imposing an additional regulatory requirement given  
19 that there wasn't sufficient evidence to indicate that  
20 the current requirement was not adequate if that makes  
21 sense.

22 The particular interim staff guidance is  
23 out for comment. Right now comments are due the 8th  
24 of June. We intend to submit comments on behalf of  
25 the industry.

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1           Most of the comments will be of a  
2 clarifying nature to make sure we understand the  
3 language, et cetera, which brings me to a more generic  
4 communication process issue. You know how I feel  
5 about generic communications based upon comments I  
6 made earlier.

7           The one thing that is not clear to us as  
8 an industry is why there is a need for an ISG process  
9 to begin with given that the NRC already has a  
10 well-established generic communication process that  
11 could be used as a vehicle for communicating staff  
12 guidance going forward.

13           So now we have generic communications.  
14 And we also have interim staff guidance, two separate  
15 processes that basically overlap. So we're going to  
16 continue making that point with every opportunity we  
17 have.

18           Lastly, I understand some question has  
19 been raised about the idea of continuing or the idea  
20 of imposing ultrasonic testing requirements. I want  
21 to make it clear that the current requirements that we  
22 currently have are for a graded approach to a visual  
23 examination.

24           And depending upon what you find, you do  
25 a more comprehensive examination, but the first step

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1 is a visual. And that's basic --

2 CHAIRMAN WALLIS: How do you visually  
3 inspect these inaccessible areas?

4 MR. MARRION: Well, as you heard from the  
5 staff, you do an examination of the inaccessible areas  
6 based upon what you find of the accessible areas if I  
7 have characterized it properly in what the staff was  
8 proposing.

9 And for the Mark I's, we intend to  
10 continue that process going forward. And we will be  
11 commenting accordingly on the ISG comments.

12 CHAIRMAN WALLIS: You have to be able to  
13 access some place which is relatively typical of the  
14 inaccessible places in order to do that.

15 MR. MARRION: Yes. I'm not familiar with  
16 the details of what that is, yes.

17 That's all I have, sir.

18 MEMBER ARMIJO: I just think that is  
19 fundamentally unsound because you have, really, a  
20 crevice condition in that sand pocket area. It's not  
21 at all represented by the accessible area.

22 And so looking at a safe location to make  
23 a judgment of a susceptible location seems to me a  
24 waste of time. I mean, if the accessible area is  
25 highly corroded, you can be sure that the inaccessible

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1 is in bad shape.

2 MR. MARRION: Right.

3 MEMBER ARMIJO: But the converse isn't  
4 true.

5 MEMBER APOSTOLAKIS: But didn't Jack say  
6 that for the water to get to the inaccessible area, it  
7 has to go through the accessible areas?

8 MEMBER ARMIJO: Yes, but it doesn't stay  
9 there.

10 VICE CHAIRMAN SHACK: It doesn't stay  
11 there.

12 MEMBER ARMIJO: It flows.

13 VICE CHAIRMAN SHACK: You have got a drain  
14 right at that thing. I mean, there is no way for  
15 water to really accumulate --

16 MEMBER APOSTOLAKIS: It is not  
17 accumulating.

18 VICE CHAIRMAN SHACK: -- in that  
19 accessible area.

20 CHAIRMAN WALLIS: But it gets to the sound  
21 --

22 MEMBER APOSTOLAKIS: But you are going to  
23 see some moisture or something.

24 MEMBER ARMIJO: You can make a case that  
25 if it's always been dry, that's your best case. You

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1 have good data.

2 MEMBER MAYNARD: I thought part of that,  
3 it would depend on what you include as a visual area  
4 for what you base -- if you're including the drains  
5 and if there is any moisture coming out of the sand  
6 drains or anything like that, well, that might be  
7 appropriate. But if you're saying that all you have  
8 to do is just visually look at the inside of the  
9 container there, that you don't have to do anything  
10 else.

11 But if you include as part of what you  
12 find visually results of drains and other things --

13 MR. MARRION: That is a comprehensive  
14 examination requirement that's in 50.55(a) right now.

15 Thank you. And I appreciate the time I  
16 spent with this illustrious body today.

17 (Laughter.)

18 MEMBER KRESS: We are honored to have you.

19 MEMBER BONACA: If there are no further  
20 questions, first of all, I want to thank the staff for  
21 their presentations and for the information. And then  
22 I'll turn the meeting back to you, Chairman.

23 CHAIRMAN WALLIS: Thank you very much.

24 We are finished with our formal  
25 presentations for the day.

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1 MEMBER KRESS: We don't have a letter on  
2 this particular issue?

3 MEMBER BONACA: No.

4 MEMBER KRESS: This was just a briefing?

5 CHAIRMAN WALLIS: Just a briefing. It was  
6 just a briefing.

7 MEMBER BONACA: There is no impact  
8 because, I mean, it was helpful because, again,  
9 yesterday we had a --

10 CHAIRMAN WALLIS: We don't need that --

11 MEMBER KRESS: Are we going to give some  
12 feedback now or anything on what we've heard or do you  
13 think the questions are sufficient?

14 VICE CHAIRMAN SHACK: The questions were  
15 sufficient.

16 CHAIRMAN WALLIS: Unless you have another  
17 point you want to make. Do you want to make some  
18 point?

19 MEMBER KRESS: Well, my point was that I  
20 just don't like this round-about way of doing things  
21 in the sense that I think there's a fatal flaw in  
22 trying to use the accessible areas to determine  
23 whether or not there is a problem in the inaccessible  
24 areas.

25 I would do what Bill Shack just said. Why

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1 not just include those sources of moisture within the  
2 scope?

3 VICE CHAIRMAN SHACK: Well, I think --

4 MEMBER KRESS: I know it has been resisted  
5 by the industry, but it doesn't seem like that big of  
6 a burden to me. I think that's the real solution.  
7 And that's what they're after, but they're trying to  
8 do it in a round-about way.

9 VICE CHAIRMAN SHACK: I also think a  
10 techie could come up with a way to measure those  
11 thicknesses.

12 MEMBER KRESS: Show me that way, and that  
13 may be okay. That's possible.

14 MEMBER SIEBER: Well, when you put the  
15 refueling seal in the scope, all you're doing is  
16 establishing an aging management program for that.  
17 That doesn't prevent leakage necessarily because there  
18 may be something other than the aging that causes the  
19 leaking.

20 MEMBER KRESS: Okay. Maybe. Maybe I am  
21 flawed.

22 MEMBER SIEBER: You could twist it, and  
23 now it leaks.

24 CHAIRMAN WALLIS: You should probably  
25 inspect a more susceptible area, which is a sand

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1 pocket.

2 MEMBER SIEBER: I think you have to deal  
3 with the --

4 MEMBER BONACA: In the past we left it to  
5 the --

6 MEMBER SIEBER: -- rather than deal with  
7 something that is removed from it.

8 MEMBER BONACA: In the past we left it to  
9 a licensee to have a choice. For example, in Browns  
10 Ferry, the staff was asking for inspection of the  
11 seals. They fought that. We left them open, either  
12 that or UT the liner in the vulnerable locations. And  
13 they chose to UT the liners.

14 The burden is inaccessibility because  
15 there is going to be that every ten years. And when  
16 they do the ISR, they are in containment. And they  
17 physically can then perform most of the utilities in  
18 those locations. So we left open those possibilities.

19 I take your point, and I think the  
20 Committee should decide. Should we have a comment on  
21 this or -- the intent wasn't one of providing a  
22 letter. This was an informational presentation, but  
23 --

24 CHAIRMAN WALLIS: I think the staff has  
25 heard our comments. It was a preliminary sort of

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1 thing. And that is probably good enough for now.

2 MR. GILLESPIE: We appreciate the comments  
3 because, as Mario said, underground cabling, piping,  
4 and this kind of large passive component are really  
5 becoming kind of the end point. Everything else we  
6 know how to deal with for the most part.

7 But I will say in this case -- and let me  
8 take Browns Ferry. You might say, well, why did  
9 Browns Ferry choose UT versus the seals. Browns Ferry  
10 actually had unidentified sources of leakage. And he  
11 said versus trying to identify every source of leakage  
12 because they didn't know where it was that their  
13 cheapest way out was actually to do the UT.

14 But they got the idea that we wanted to  
15 wait. And you had to assure us this thing was going  
16 to be okay relative to thickness.

17 VICE CHAIRMAN SHACK: That sand pocket is  
18 pretty big. I mean, you can have a fair amount of  
19 moisture in there that you're never going to see  
20 coming out of those drains. And, yet, you could have  
21 attack over a reasonable fraction of that.

22 MEMBER SIEBER: There are oodles of  
23 surface in there for the moisture to collect on.

24 MR. GILLESPIE: But, again, the locations  
25 of the drains are plant-specific. Some plants have

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1 seals, as Monticello had over it. Some places have a  
2 liner or coding on the other side of the surface.

3 VICE CHAIRMAN SHACK: Well, a bottom drain  
4 would give me a whole lot more comfort than that top  
5 drain would.

6 MR. GILLESPIE: Yes. The other thing is  
7 the sand is very compacted.

8 MEMBER KRESS: Have you ever tried to  
9 drain moisture out of the sand from the bottom? It  
10 doesn't come out.

11 MR. GILLESPIE: I don't want to pooh-pooh  
12 it, but the idea that this is a 130-degree area also  
13 --

14 VICE CHAIRMAN SHACK: You drive it out  
15 with --

16 MR. GILLESPIE: And so you're going to  
17 drive it out. And so you've actually got the occasion  
18 to get water in there about 20 days every 18 months or  
19 24 months depending on the fuel cycle someone is on  
20 and how long it's flooded. And that's why we've  
21 started to key into visual. You might say, visual  
22 leakage from someplace kicks you into needing to do a  
23 UT.

24 Now, what this inter-staff guidance  
25 position does do is says the identification of

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1 moisture, basically leakage, is equivalent to the  
2 visual recognition of accelerated corrosion on the  
3 inside. And that's an important distinction, which  
4 never existed before.

5 So for the inaccessible areas, we're using  
6 the indirect indication of seeing water as kind of an  
7 assumption that you have to do the same thing as if  
8 you saw accelerated corrosion on the inside. That  
9 gets us a measurement on an event basis.

10 And so someone who is sworn to keeping  
11 this thing dry, if they have an event during a  
12 refueling where they get leakage in there, now they're  
13 obligated to do something which is a bit more onerous  
14 and reestablish their rate.

15 It's not perfect. By the way, there are  
16 two inaccessible areas. We should be clear on that.  
17 There is the inaccessible area in the air gap. And  
18 then there's this inaccessible area that's layered on  
19 the bottom between the two concrete layers, which is  
20 really probably the most difficult area, but it was  
21 designed to last 40 years. It is totally lined with  
22 concrete. And then you've got this temperature  
23 gradient.

24 CHAIRMAN WALLIS: Is 40 years good enough  
25 with license renewal, though?

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1 MR. GILLESPIE: Now, it was originally  
2 designed for 40 years, but that was kind of an  
3 assignment. But now if you have no evidence of in  
4 leakage or water in there, I mean, again, it's  
5 indirect stuff. It's almost like a circumstantial  
6 case we're acting --

7 CHAIRMAN WALLIS: Concrete is not dry all  
8 the time.

9 MR. GILLESPIE: Concrete is porous  
10 material, and it is not dry all the time. And so then  
11 you could ask questions. A fair question in the aging  
12 management program is, what are you doing about  
13 groundwater? And do we have any evidence of  
14 groundwater?

15 We asked that from Nine Mile. And I think  
16 we're coming. I signed up the draft SE this morning.  
17 So I think next month we're probably coming on Nine  
18 Mile. They have actually got alarms on their drains  
19 if moisture is detected.

20 So every plant is doing some unique  
21 things.

22 CHAIRMAN WALLIS: Moisture can come out of  
23 the concrete. There is a lot of concrete. There is  
24 a late curing of the concrete which goes on for a long  
25 time. Then it can be damp. It doesn't have to be

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1 very damp --

2 MR. GILLESPIE: Right.

3 CHAIRMAN WALLIS: -- to produce some  
4 chemical reaction.

5 MR. GILLESPIE: What is the impact? This  
6 is what I don't know, is what is the impact of this  
7 temperature gradient.

8 CHAIRMAN WALLIS: You don't have oxygen.  
9 So that is probably what protects you.

10 MR. GILLESPIE: And so there is a number  
11 of things that -- we're doing our best, appreciate the  
12 Committee's comments, and more than happy. If anyone  
13 else has any better ideas, we would love to have them,  
14 but this ISG was an effort to send a benchmark for  
15 basically the best-performing plant on liners.

16 It has no moisture. What if you get  
17 moisture? How do you establish your rate? This is  
18 kind of putting out, in essence, that they now know we  
19 do expect a rate to even be established. We didn't  
20 have that in writing before.

21 CHAIRMAN WALLIS: We won't comment on it,  
22 and we hope it works out.

23 MR. GILLESPIE: Well, feel free to comment  
24 on it. We're happy to have comments. NEI is going to  
25 feel free to comment on it.

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1 CHAIRMAN WALLIS: We won't.

2 MEMBER BONACA: Certainly we will comment  
3 on individual applications.

4 MR. GILLESPIE: Yes. I do think this is  
5 middle ground we are wrestling with here because I do  
6 agree with Alex that the individual designs that we're  
7 applying this concept to are significantly different.  
8 In critical questions, like locations of drains, some  
9 are going to be more susceptible than others.

10 As I said, Browns Ferry said we have  
11 unidentified leakage. We know we have leakage. It's  
12 not a lot. UT is our answer. It's the only way that  
13 could give us positive confirmation.

14 CHAIRMAN WALLIS: Have they been having  
15 leakage on their reactor which has been shut down for  
16 all that period of time, unidentified leakage?

17 MR. GILLESPIE: Well, remember, we license  
18 units I, II, and III. The floor wasn't flooded on 1.  
19 So they haven't had any leakage on I for a long time.

20 CHAIRMAN WALLIS: They think they haven't.  
21 They could have an unidentified leakage.

22 MR. GILLESPIE: They had some unidentified  
23 leakage from refuelings in the other units, and they  
24 chose UT.

25 MEMBER SIEBER: They have them for fuel

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1 for --

2 MR. GILLESPIE: By the way, this is a very  
3 high-dose area, too. And so the question here isn't  
4 money.

5 MEMBER BONACA: Not only they. I mean --

6 MR. GILLESPIE: It's going to be dose.

7 MEMBER BONACA: Where the seals are, it's  
8 a very high red area.

9 MR. GILLESPIE: Yes.

10 MEMBER BONACA: Not down in the sand  
11 pocket.

12 MR. GILLESPIE: It depends on where you're  
13 at. You're directly under the vessel.

14 CHAIRMAN WALLIS: No one is going to go  
15 down there.

16 MR. GILLESPIE: My understanding from the  
17 licensees is from a radiological perspective, this is  
18 not an area you want to take lightly doing extra  
19 measurements over and above what you really need to  
20 confirm your --

21 CHAIRMAN WALLIS: BSBWR has hatches that  
22 you go in into the reactor pedestal area.

23 MEMBER BONACA: We were told by TVA that  
24 it is not a high red area because it is well below the  
25 --

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1                   MEMBER KRESS:  Graham, I was wondering if  
2                   the staff is considering a user need letter to  
3                   Research to try to develop a way to do this more  
4                   definitively, maybe strong on ultrasonics or  
5                   something.  Is there such a user need letter or any --

6                   VICE CHAIRMAN SHACK:  Well, there is  
7                   something from Oak Ridge now.

8                   MR. GILLESPIE:  Actually, there is a  
9                   letter report that just recently got put in ADAM from  
10                  Oak Ridge, from a project that Research sponsored, but  
11                  it is not commercially available yet.  And, as best I  
12                  understand it, it is a technique to calibrate for this  
13                  concrete steel concrete sandwich.

14                  I think, as I understand it, there are  
15                  three different alternative approaches to doing it.  
16                  And so the information is starting to be developed and  
17                  published.  But we're probably years away from actual  
18                  commercial application to go from the research bench  
19                  to the --

20                  MEMBER KRESS:  Yes, but you have got years  
21                  to go to do it in.  I mean, the corrosion rate is low  
22                  enough that --

23                  MR. GILLESPIE:  I am not disagreeing.  If  
24                  the Committee would like to -- we think we're actually  
25                  pretty close right now on a plant-by-plant basis.  But

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1 if the Committee would like to write a letter  
2 recommending a research project, it's okay. I don't  
3 mind. It's your Committee.

4 MEMBER SIEBER: The question is what do  
5 you want to cut out to pay for it.

6 MEMBER MAYNARD: I would like to just add  
7 on to Tom's previous comment just a little bit. It  
8 doesn't surprise me. And I would expect the industry  
9 to resist new requirements, new changes to things. I  
10 think it better to get the fight over, have it once,  
11 rather than a lot of times.

12 So, rather than dealing with a lot of  
13 things through staff guidance, generic letters, a lot  
14 of times it would be better if this is going to be a  
15 new expectation, new requirement, let's follow the  
16 process and make that -- you know, get the fight over  
17 with once, make it happen, rather than continually  
18 trying to go around these systems just generically.

19 MEMBER SIEBER: The requirement has always  
20 been there. And it stems from the code requirement.  
21 The question is, what do you do and how do you do it  
22 to give yourself a reasonable assurance that you're  
23 okay.

24 MR. GILLESPIE: The new aspect now is  
25 people having to articulate in an aging management

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1 program what they're going to do to ensure that their  
2 monitoring and measurement process for this liner will  
3 detect its approach to minimum wall thickness prior to  
4 it getting there.

5 I mean, that's really what plant license  
6 renewal is, to ensure that you have the additional  
7 monitoring programs in place that you will detect and  
8 correct prior to exceeding that minimum wall  
9 thickness.

10 The discussion of this ISG between us and  
11 the industry is evoked. I think it has now gotten us  
12 to a point where we have some actual cases under our  
13 belt that have now, you might say, set the standard  
14 for the next ones to come in.

15 And now we've got each plant evaluating  
16 itself against the plants we have already looked at  
17 and saying, "Am I like them? Am I different? If I'm  
18 different, then is it a positive difference or  
19 negative difference?"

20 And now we're starting to get those kind  
21 of aging management considerations into this piece of  
22 equipment, which we did not have, quite honestly,  
23 going in until we hit Browns Ferry.

24 The Committee wants -- Mario will remember  
25 this. I forget which BWR they were in. It was on the

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1 steam dryers. And I used the Committee. I quoted the  
2 Committee to the staff on the liner. And it was on  
3 the dryers.

4 And, Mario, I forget. You might have been  
5 the one who said it. You said it's large, it's  
6 passive, and you just wrote a generic letter saying  
7 it's safety. It wasn't in scope before that statement  
8 was made. It's now in scope. And, you know, the  
9 staff said it's large, it's passive, it has corrosion,  
10 and it's safety. And so now we're trying to take it  
11 on head on. I think with some success, you're seeing  
12 the applications getting it addressed at some level of  
13 credibility now.

14 MR. THADANI: Graham, I have one quick  
15 question.

16 Frank, you noted this is a high-dose area.  
17 This issue is one important in many ways, has I think  
18 rather minimal risk to public. How is that sort of  
19 balanced in terms of the actions called for and its  
20 relative importance?

21 MR. GILLESPIE: I think how we are trying  
22 to deal with that -- and we have got a meeting with  
23 one applicant day after tomorrow, Oyster Creek, on  
24 this, on our residual concerns after their RAIs. And,  
25 really, what we started talking about was the

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1       uncertainties involved in the decision.

2                   And so the question really is, how much  
3       should you pay for certainty in a decision? Because  
4       the significant measurement uncertainty and doing  
5       these UT exams, they're actually fairly coarse.

6                   There is uncertainty in primers and  
7       liners, which have exceeded, basically, the  
8       manufacturer-recommended lives of 10 to 15 years.  
9       Yet, they're still there. And they're still being  
10      inspected doing what they're doing.

11                  There is uncertainty in have you picked  
12      enough selected locations because we are looking for  
13      a general area degradation. We're not looking for  
14      just pitting.

15                  The Committee didn't mention it, but there  
16      are really two concerns. One is pressure retention  
17      and accident. And the other is buckling, the sheer  
18      collapsing of this thing under its own weight. And so  
19      you've got two reasons to inspect two different areas.

20                  And so I would suggest that in this ISG  
21      and what we're seeing from these utilities, we're  
22      actually accepting, you might say, a fair level of  
23      uncertainty in it to keep it rational.

24                  And so the safety consideration is in how  
25      much do we want to press people to make it more and

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1 more certain. And so that's really how we're  
2 factoring in the safety significance of it.

3 When I talk about dose and how many  
4 measurements need to be taken, we need reasonable  
5 assurance. And in many cases, there's not positive  
6 evidence on either side because this is a large  
7 passive thing that was put in there. It's expected to  
8 last forever fundamentally from the designer's point  
9 of view. We're confirming that assertion.

10 CHAIRMAN WALLIS: It probably will in most  
11 plants last.

12 MR. GILLESPIE: In most plants, I think it  
13 will. And so it's a confirmation. And so we're not  
14 designing the plant, which is very vigorous. We're  
15 confirming that the expected performance will be  
16 sustained. And we probably can be slightly less  
17 rigorous in the uncertainty we accept on that.

18 CHAIRMAN WALLIS: That is all the agency  
19 ever does. It doesn't design plants.

20 MR. GILLESPIE: Right.

21 CHAIRMAN WALLIS: It confirms performance.

22 MR. GILLESPIE: But you learn how much,  
23 what you're going to do in that confirmation.

24 MEMBER BONACA: Yes.

25 CHAIRMAN WALLIS: I think we may have gone

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1 over. We have gone over 15 minutes. I think it's  
2 about time we --

3 MEMBER BONACA: One last comment I had was  
4 that, you know, so many of the -- however the  
5 inspection processes we still depend on, for example,  
6 the visual inspection of this, we are still at the  
7 pace that really was conceived at the moment these  
8 plants are put in renewal. Okay? So every ten years  
9 they go in and look at it. Okay?

10 To me, you know, as these plants get older  
11 and older, these inaccessible areas, et cetera, you  
12 know, then maybe the frequency with which we're  
13 looking at it becomes more questionable because, you  
14 know, every ten years, a lot of things can happen.

15 CHAIRMAN WALLIS: Especially when you  
16 start to find things.

17 MR. GILLESPIE: We have occasions in  
18 several licensees where because they were sticking to  
19 a more extended inspection period, even when they had  
20 evidence of water, they did not consider evidence of  
21 water equivalent to accelerated corrosion visually.

22 So this ISG actually tries to take the  
23 principle you just espoused and says, "You can no  
24 longer in our expectation, staff's expectation, you  
25 can no longer ignore the presence of water. You have

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1 to now give us positive confirmation that the rate of  
2 degradation is still being minimized.

3 CHAIRMAN WALLIS: It is not boric acid.

4 MR. GILLESPIE: Yes, yes. At least we're  
5 dealing with a general moisture.

6 CHAIRMAN WALLIS: Right.

7 MR. GILLESPIE: And so this actually does  
8 go for that extended period to some incidents in which  
9 we actually have evidence from various licensees.  
10 They had evidence of water and basically did an  
11 engineering evaluation and did not obtain positive  
12 information if the thickness was okay.

13 MEMBER BONACA: What are you going to do  
14 when one of the already approved license renewals is  
15 going to come in for another license renewal?

16 MR. GILLESPIE: They have talked to us  
17 about that.

18 MEMBER BONACA: Well.

19 MR. GILLESPIE: I'm hoping to be retired  
20 by that point.

21 MEMBER BONACA: Anyway, I think we will  
22 see how this works.

23 MR. GILLESPIE: I started with the draft  
24 of the renewal rule in 1989 and have been doing this  
25 now for the last five years. At some point, someone

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1 else should do it.

2 MEMBER BONACA: All right.

3 MR. GILLESPIE: Thank you.

4 MEMBER BONACA: I give you back the  
5 meeting, Mr. Chairman.

6 CHAIRMAN WALLIS: We are ready to come off  
7 the record. Thank you very much for recording the  
8 meeting today, and we will take a break until a  
9 quarter to 5:00.

10 And when we come back, we will finish  
11 Mario's letter, which seems to be fairly  
12 straightforward. And then we will know where we are  
13 going with the other letter, hopefully know well  
14 enough that we can see our way to the end of it  
15 tomorrow.

16 (Whereupon, the foregoing matter was  
17 concluded at 4:34 p.m.)

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# Official Transcript of Proceedings

## NUCLEAR REGULATORY COMMISSION

Title: Advisory Committee on Reactor Safeguards  
533rd Meeting

Docket Number: (not applicable)

Location: Rockville, Maryland

Date: Wednesday, May 31, 2006

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS (ACRS)

533rd MEETING

+ + + + +

WEDNESDAY, MAY 31, 2006

+ + + + +

ROCKVILLE, MARYLAND

+ + + + +

The Subcommittee met in Room T2B1 at Two White Flint North, 11555 Rockville Pike, Rockville, Maryland, at 8:30 a.m., Graham B. Wallis, Subcommittee Chair, presiding.

MEMBERS PRESENT:

- GRAHAM B. WALLIS Chairman
- WILLIAM J. SHACK Vice Chairman
- GEORGE E. APOSTOLAKIS Member
- J. SAM ARMIJO Member
- MARIO V. BONACA Member
- RICHARD S. DENNING Member
- THOMAS S. KRESS Member
- OTTO L. MAYNARD Member
- JOHN D. SIEBER ACRS Member-At-Large
- JOHN LARKINS Designated Federal Official

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1       ACRS STAFF PRESENT:

2       HANS ASHAR                    NRR

3       DANIEL FRUMKIN                NRR

4       ALEX KLEIN                    NRR

5       THOMAS KOSHY                 EEEEB/DE/NRR

6       MICHAEL MAYFIELD             DE/NRR

7       GEORGE MORRIS                EEBE/DE/NRR

8       LINH TRANS                    NRR

9       GEORGE WILSON                NRR

10      ROBERT WOLFGANG             NRR

11      ROY WOODS                    RES

12

13      ALSO PRESENT:

14      HAROLD BARRETT               Duke Power Company

15      MIKE FALLON                   Constellation Energy

16      ALEX MARRION                 NEI

17      DAVID MISKIEWICZ            Progress Energy

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AGENDA ITEMS

PAGE

Opening Remarks, Chairman Graham B. Wallis . . . 4

Draft Final Generic Letter, "Post-Fire  
Safe-Shutdown Circuit Analysis  
Spurious Actuations" . . . . . 5

Draft Final Generic Letter 2006-XX,  
"Inaccessible or Underground Cable  
Failures that Disable Accident  
Mitigation Systems" . . . . . 149

Interim Staff Guidance on Aging Management  
Program for Inaccessible Areas of Boiling  
Water Reactor (BWR) Mark I Containment  
Drywall Shell . . . . . 195

Adjournment

## P R O C E E D I N G S

(8:31 a.m.)

CHAIRMAN WALLIS: The meeting will now come to order.

This is the first day of the 533rd meeting of the Advisory Committee on Reactor Safeguards. During today's meeting, the Committee will consider the following:

Draft Final Generic Letter, Post-Fire Safe-Shutdown Circuit Analysis Spurious Actuations, Draft Final General Letter, Inaccessible or Underground Cable Failures that Disable Accident Mitigation Systems, Interim Staff Guidance on Aging Management Program for Inaccessible Areas of Boiling Water Reactor Mark I Containment Drywell Shell, and Preparation of ACRS reports.

This meeting is being conducted in accordance with the provisions of the Federal Advisory Committee Act. Dr. John T. Larkins is the Designated Federal Official for the initial portion of the meeting.

We have received no written comments from members of the public regarding today's sessions. We have received a request from Alex Marrion, NEI, for time to make oral statements regarding the Generic

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1 Letter on Post-Fire Safe-Shutdown Circuit Analysis and  
2 the Generic Letter on Inaccessible or Underground  
3 Cable Failures that Disable Accident Mitigation  
4 Systems.

5 A transcript of portions of the meeting is  
6 being kept and it is requested that the speakers use  
7 one of the microphones, identify themselves, and speak  
8 with sufficient clarity and volume so that they can be  
9 readily heard.

10 I will begin with some items of current  
11 interest. In the items handed out to you, I notice  
12 that there is a speech by Commissioner Yatzko at the  
13 beginning. And at the end, there is an interesting  
14 article on various matters which complicate PWR sump  
15 evaluations.

16 Now in the middle of the day, we are going  
17 to have ethics training which is why the lunch break  
18 is so long today. And the ethics training is  
19 scheduled for between 12:15 and 1:30 so you should be  
20 here at 12:15 and ready to be trained in ethics.

21 That is the end of my prepared remarks.  
22 And I'd like to proceed with the meeting. Call on  
23 Rich Denning to get us started on the first item.

24 MEMBER DENNING: Thank you. We will be  
25 hearing from the staff regarding the draft final

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1 generic letter 2006-XX, Post-Fire Safety-Shutdown  
2 Circuit Analysis Spurious Actuations. The Committee  
3 will hear presentations by and hold discussion with  
4 representatives of the staff.

5 Additionally, Mr. Alex Marrion with NEI,  
6 has requested ten minutes to share NEI's perspective  
7 after the staff's presentation.

8 The Committee had requested to review the  
9 generic letter regarding Post-Fire Safe-Shutdown  
10 Circuit Analysis Spurious Actuations after the public  
11 comment period. We did not have a prior subcommittee  
12 meeting on this letter which may have been a mistake.

13 I have serious reservations about the  
14 balance between regulatory burden and approved safety  
15 associated with this letter. The letter leaves open  
16 options for risk informing this process but they are  
17 not easy activities to perform. So we are anxious to  
18 hear what the staff has to say on this. And to have  
19 a healthy discussion, I believe.

20 We have a considerable period of time  
21 actually to do this, three hours. But I think that we  
22 will want to look into this letter very carefully  
23 before giving our blessing.

24 I think we are now ready to hear from  
25 staff. And I'll turn it over to Alex Klein of the

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1 Office of Nuclear Reactor Regulation.

2 MR. KLEIN: Thank you very much. My name  
3 is Alex Klein. You see on the cover slide here my  
4 branch chief's name, Sunil Weekakkody. He extends his  
5 regrets for not being able to attend today's meeting  
6 in that he had a prior commitment for jury duty today.  
7 With that, I'm acting in his place so I will give the  
8 opening presentation.

9 The purpose of today's meeting and the  
10 presentation to the Committee is to present the final  
11 draft of Generic Letter 2006-XX, Post-Fire Safe-  
12 Shutdown Circuit Analysis Spurious Actuations. We are  
13 also here to obtain ACRS endorsement to issue the  
14 proposed generic letter.

15 I'd like to introduce the two primary  
16 staff members who will present today for NRR. To my  
17 left is Robert Wolfgang who is the primary author of  
18 the generic letter. And to my right is Daniel  
19 Frumkin, fire protection engineer, from the Office of  
20 NRR, who will speak to you about some of the NEI and  
21 EPRI fire testing.

22 We also have in the audience with us  
23 supporting staff members from NRR who were also  
24 instrumental in the development of this generic  
25 letter.

1           As an overview, I wanted to advise the  
2           Committee that there is a lot of history leading up to  
3           this generic letter. And you will hear some of this  
4           today. We did a bounding analysis, full of risk. We  
5           also did a regulatory analysis of the generic letter.  
6           But at this time, those slides are not in our  
7           presentation. But we are certainly prepared to  
8           discuss those aspects.

9           MEMBER DENNING: We absolutely would like  
10          to see those slides.

11          MR. KLEIN: Very good.

12          So the probability of spurious actuations  
13          due to fires will be presented by Dan Frumkin after I  
14          speak. And then after Dan speaks, we will receive a  
15          summary of the objectives of the generic letter by Bob  
16          Wolfgang.

17          Again, based upon the long history of this  
18          generic letter and so forth, there has been differing  
19          views between the industry and the NRC on the  
20          credibility of multiple spurious actuations. You will  
21          hear about the NEI/EPRI cable fire test results from  
22          Dan Frumkin, as I indicated.

23          I also wanted to indicate to the Committee  
24          that we are continuing with our inspections using  
25          risk-informed aspects. For example, RIS 2004-03,

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1 certainly one of the goals of issuing this generic  
2 letter is to reestablish compliance with the  
3 regulations.

4 That concludes my introductory remarks.  
5 And I'll hand over the presentation to Dan Frumkin.

6 CHAIRMAN WALLIS: When you present, could  
7 you make it clear to me just what it is you are asking  
8 industry to do because I had a lot of trouble figuring  
9 that out. There is a lot of sort of rather vague  
10 requirements it seems to me. And perhaps you can in  
11 your presentation make it clear just what it is they  
12 have to do.

13 MR. KLEIN: Yes.

14 MR. FRUMKIN: Good morning. My name is  
15 Dan Frumkin from the Office of NRR. I work for Sunil.  
16 And today I'm going to present some of the background  
17 from the NEI/EPRI testing that is discussed in the  
18 generic letter.

19 I see some new faces around the ACRS table  
20 so I'm going to pass around some tables from some  
21 testing that occurred. At the end of the cables that  
22 are fused together, you will be able to see two  
23 failure modes or examples of two failure modes. One  
24 is an inter-cable which is two cables -- or actually  
25 one is an intra-cable, which we use these terms intra

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1 within a single cable and inter between two separate  
2 cables. And this provides an example of both.

3 The highlighted portions within a cable  
4 are very close together that have failed together.  
5 And then we also have intruding cable that has  
6 penetrated the outer jacket and apparently the inner  
7 cable protection and come at least into very close  
8 contact which you can see.

9 We will talk also about the different  
10 types of cable. This is a thermal plastic cable,  
11 which is the more vulnerable cable, but as you can  
12 see, that it is subject to both failures from internal  
13 and external cables when put under the suitable heat  
14 or fire exposure.

15 So I'll be providing some background on  
16 the testing that provided the insight into the failure  
17 likelihoods, the objectives of that testing, some  
18 details of the testing, some of the test results, and  
19 a few conclusions based on the testing.

20 And then Mr. Wolfgang will be talking  
21 about the generic letter more specifically.

22 The NEI/EPRI testing was intended to  
23 address fire-induced circuit failure issues of concern  
24 to the NRC staff, principally the potential for  
25 spurious operations of equipment.

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1           This was intended to basically bring to  
2 close the question that the staff kept on bringing up  
3 that Browns Ferry had these and the industry said that  
4 well, it is very unlikely to occur. So this was  
5 intended to bring that to a close.

6           NRC witnessed the testing and also did  
7 some insulation resistant testing using Sandia  
8 National Laboratory resources.

9           And there are four documents that either  
10 in whole or in part document the results of some of  
11 the testing. The characterization of fire-induced  
12 circuit failures results is the big report from EPRI.

13           The circuit analysis failure modes and  
14 likelihood analysis is the Sandia Report of their  
15 insulation resistant testing.

16           These results were pulled into the NUREG  
17 6850, which is the fire protection re-quantification  
18 or the fire PRA methodology for nuclear power  
19 facilities. This is the state-of-the-art document  
20 that Research has developed to -- it is a handbook on  
21 how to do fire PRA.

22           And then there was the spurious actuation  
23 expert elicitation which was experts reviewing the  
24 testing and coming up with results.

25           The objectives, as I said, was to research

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1 the characteristics of fire-induced circuit failures  
2 to better understand these plants' responses to cable  
3 failures. And, as I said, the NRC also was involved  
4 in the testing and reviewed -- witnessed the testing  
5 and did their own insulation resistant testing.

6 So the details of the test, there were 18  
7 fire tests that were conducted between January 9th,  
8 2001 and June 1st, 2001 at the Omega Point  
9 Laboratories in San Antonio. And the three types of  
10 fire exposures were tested during the test. The hot  
11 gas layer region which is up at the ceiling level, the  
12 fire creates a buoyant plume and it fills the  
13 enclosure from the top down. And that is the hot gas  
14 layer.

15 Then below -- between the fire -- the  
16 actual fire and the hot gas layer is what we call the  
17 plume region where there is no flaming but that is a  
18 very hot part of the -- that is the hottest part of  
19 the smoke region of the fire.

20 And they also tested a radiant exposure  
21 where you get close to the fire itself or sometimes  
22 worst case could be up next to the plume region  
23 depending on emissivity of the smoke and the radiant  
24 energy coming off. If it is a clean burning flame, it  
25 may not have a high radiant energy but the smoke may

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1 be higher. So -- but they just used, I believe, a  
2 fixed radiant number but that is a little discussion  
3 of the radiant energy.

4 One thing that they didn't do that I will  
5 add is they did not put cables in the flaming region.  
6 That is why I have this highlighted. We, the staff,  
7 hear a lot from the licensees about how long it takes  
8 to have these cables fail. And that there is plenty  
9 of time in all situations for mitigation.

10 And based on the testing, yes, in a lot of  
11 the testing there was a lot of time before there was  
12 failure in, you know, 30, 40 minutes for some of the  
13 tests. But none of the tests tested this flaming  
14 region.

15 So this leaves the staff a very strong  
16 question of how fast -- well, first we don't know what  
17 failures will occur in that region. They could occur.  
18 They may not occur. We don't have the information.

19 It is very clear that if they do occur,  
20 they will occur much more quickly. The temperatures  
21 are over, you know, much -- a thousand degrees hotter  
22 in the flaming region. And there is also an ignition  
23 source. So it is a very different phenomenon. And  
24 cables could be exposed to a flaming region in the  
25 plant.

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1           So this test is not a complete picture of  
2           -- or let me just say that the timing factors that  
3           came out of the testing that was done are not a  
4           complete picture of the possible scenarios that could  
5           occur.

6           MEMBER APOSTOLAKIS: It appears that you  
7           were participating in the conduct of these tests. Did  
8           you express these concerns to EPRI when they were  
9           designing the tests?

10          MR. FRUMKIN: Well, I wasn't specifically  
11          involved in that. I don't believe that the test was  
12          intended to develop timing. And as such, it wouldn't  
13          have been an issue. The licensees or the industry has  
14          brought this timing issue and perhaps inappropriately  
15          based on the testing.

16          It is useful to heat this cable slowly  
17          because then the hot shorts would probably exist for  
18          a longer period of time. But whether this -- but my  
19          only point is that I don't believe that this testing  
20          provides a basis to say that hot shorts -- this test  
21          I don't think was intended or can provide a basis for  
22          timing. But I believe it is being applied or some  
23          intend to use it to show that there is a timing issue.

24          MEMBER APOSTOLAKIS: I would be such an  
25          obvious thing to do. I mean there must be a reason

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1 why they didn't do it. Do you know that? Or should  
2 we ask Mr. Marrion when he comes?

3 MR. FRUMKIN: Why they didn't do the  
4 flaming region? Yes, that is a fair question. But I  
5 believe the answer -- like I said, I do think that  
6 that was not -- if there hadn't been any failures  
7 outside of flaming region, I think there would have  
8 been a strong feeling that failures in the flaming  
9 region would have been maybe less likely. But it is  
10 a fair question.

11 MEMBER APOSTOLAKIS: Okay.

12 CHAIRMAN WALLIS: Does the material from  
13 which the insulation is made, does that actually burn  
14 at some temperature?

15 MR. FRUMKIN: Yes.

16 CHAIRMAN WALLIS: But if you stuck it in  
17 a flame, you would expect the insulation itself to  
18 catch fire.

19 MR. FRUMKIN: Yes. The ASTM -- or, I'm  
20 sorry, the IEEE 383 fire test that has been the  
21 standard fire test is actually a burning test. And it  
22 ignites the flames from the bottom in a vertical cable  
23 tray. And all the cables do catch on fire when  
24 exposed to flame. But some of them propagate more or  
25 less slowly.

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1           There are some specialized cables that  
2 don't catch on fire but those were not tested. Those  
3 aren't what we are talking about here.

4           So the results of the tests showed with  
5 some confidence that failures within multi-conductor  
6 cables are likely and when they do occur, they occur  
7 in multiple conductors within the same multiple  
8 conductor cable. So as you can see from that cable  
9 bundle, there may actually be more than one cable  
10 conductor within the cable further down the jacket  
11 that you can't see.

12           And then the way they are spiraled  
13 together in there so that various cables could come in  
14 contact with other cables within the same cable.  
15 Various conductors could come into contact with other  
16 conductors within the same cable.

17           In addition, multiple devices were shown  
18 -- the spurious actuation data showed that a single  
19 hot short within a multi-conductor cable usually  
20 effected actuation devices simultaneously. If there  
21 were two devices -- I believe the way they set this  
22 test up is they wanted a very practical approach.

23           So they actually put -- rather than doing  
24 similar to the Sandia testing where they used an  
25 insulation-resistance device, they used actual plant

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1 equipment, which they just plugged it in as they would  
2 in the plant and if it would actuate or not actuate.  
3 So it was a real pragmatic thing and they did actuate.  
4 And as the testing showed, some actuated  
5 simultaneously.

6 MEMBER MAYNARD: Did they also measure how  
7 long the signal stayed there? Or how long it  
8 actuated?

9 MR. FRUMKIN: Yes. And most of the hot  
10 shorts were of a short duration. And some were in the  
11 order of minutes, I believe.

12 This is a table of results of the best  
13 estimates given cable damage of a spurious actuation  
14 probability. And the purpose of this table is not to  
15 -- the purpose of this table is just to show that the  
16 NRC and the industry -- or at least the results from  
17 the EPRI report which was developed by industry, are  
18 very consistent.

19 The staff and the risk people in industry  
20 really are on the same page with the likelihood of  
21 spurious actuations. There are some factors of two  
22 here, differences, but in probabilistic and  
23 likelihoods, in that world it is a small difference.

24 CHAIRMAN WALLIS: This is strange to me.  
25 It must depend on the extent of the damage. I mean if

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1 you just burn a cable for a short time, nothing  
2 happens. If you burn it for long enough, you are  
3 going to get shorts. So you can't just have a  
4 probability. It is going to depend on the extent of  
5 the damage to the cable.

6 MR. FRUMKIN: Yes. In all these, cables  
7 were exposed to damage. So this is given that these  
8 cables were damaged.

9 CHAIRMAN WALLIS: But to what extent?

10 MEMBER APOSTOLAKIS: It is a critical  
11 probability. I mean -- or, as you said earlier --

12 PARTICIPANT: At some point the  
13 probability is one, right?

14 MEMBER APOSTOLAKIS: I mean there is a 0.6  
15 conditional probability that you will have a spurious  
16 actuation. This is conditional on the probability  
17 that the cable is damaged.

18 MR. FRUMKIN: Correct.

19 MEMBER APOSTOLAKIS: And what is that?

20 MR. FRUMKIN: That depends on the  
21 scenario. For example, if a cable is a foot above a  
22 piece of switch gear or let's say -- and this is not  
23 an unlikely situation -- a foot above 20 or 30 feet of  
24 switchgear. It runs across the cable tray, across the  
25 top of a number of pieces of switchgear, what is the

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1 probability?

2 Well, that could be calculated typically,  
3 I think, a single piece of switchgear is five times E  
4 to the minus five. Or, you know, in that range. But  
5 then it certainly would be damaged if there was even  
6 a small fire in that piece of switchgear.

7 So there is -- you could have cable -- and  
8 then that same cable does go through different areas  
9 where it could be exposed to different other fires.  
10 A single cable could go through three, four, five  
11 different areas and be exposed to a dozen different  
12 fire scenarios.

13 MEMBER DENNING: I think we have to  
14 recognize the context within which this is done,  
15 George. And I think it is important when we try to  
16 get into the question of risk informing this and that  
17 is basically we are doing a deterministic safe  
18 shutdown analysis in which you assume there is a fire  
19 in a zone -- in a fire area. And it can burn there  
20 for three hours. You know even though there are other  
21 mitigating things that would clear that, we assume it  
22 can burn for three hours.

23 So then the question is well, with this  
24 massive potential exposure, then you have got a cable  
25 running through there. What's the potential that it

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1 could then be heated up to a point at which you get  
2 this kind of interaction? You know it doesn't get at  
3 all into the questions of you have a fire in a room,  
4 what is the possibility that any cables are exposed,  
5 you know, before it is controlled.

6 MEMBER APOSTOLAKIS: But if we are doing  
7 a deterministic analysis, why are we calculated  
8 spurious actuation probabilities?

9 MEMBER DENNING: Well, let me give my view  
10 but I'd certainly like to hear your view, and that is  
11 that the question is not so much whether you can have  
12 spurious actuations but how many can you have? How  
13 many combinations of things can you deal with?

14 The industry has always agreed to looking  
15 at a spurious actuation on a one-at-a-time basis, you  
16 know. And so I think that what the staff is trying to  
17 do is to give the feeling that -- or their impression  
18 that this isn't the really rare event -- the extremely  
19 rare event that actually would have some kind of  
20 spurious actuation occurring.

21 And then I think by implication then maybe  
22 there is the potential for multiple spurious  
23 activations.

24 MEMBER APOSTOLAKIS: Well, the second  
25 bullet of the previous slide, I guess, is then the

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1 key, right? Is that what -- of devices?

2 MEMBER DENNING: Well, I would be curious.  
3 What is your -- if you were answering that question,  
4 how would you have answered George's question? Why  
5 are we looking at probabilities here now?

6 MR. FRUMKIN: Well, okay, maybe this slide  
7 was poorly planned. But the point of the slide is  
8 twofold. One is to say that with regard to  
9 probabilities, the staff and the industry people who  
10 do this work are on the same page.

11 And the second reason, I guess, is to show  
12 that these probabilities are very high in  
13 probabilistic space, that some of them are close --  
14 you know, 0.6, and then if you have a 0.6 scenario and  
15 you have two 0.6 scenarios, you've got a 0.36  
16 scenario. So that even multiple can be a fairly high  
17 probable.

18 MEMBER DENNING: Now help us though -- you  
19 can't say that without giving some conditionality of  
20 --

21 MR. FRUMKIN: Right.

22 MEMBER DENNING: -- 0.6 conditions on  
23 what?

24 MR. FRUMKIN: Cable damage.

25 MEMBER DENNING: Cable damage.

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1                   MEMBER ARMIJO: I have a problem with  
2 cable damage. Is this severe? Moderate? I have no  
3 feeling of -- I can see where all the insulation is  
4 burnt to a crisp and I would call that severe.  
5 Wouldn't these probabilities all be one?

6                   MR. FRUMKIN: No. Well, okay, so what  
7 this is talking about is the spurious actuation  
8 probability, not shorting situation. This is the  
9 likelihood of a hot short occurring within a cable  
10 without that cable shorting to its conduit or cable  
11 tray because generally once the hot conductors fail to  
12 the conduit or cable tray or the nearest ground, then  
13 they would certainly -- that would clear the spurious  
14 actuation.

15                  MEMBER MAYNARD: Okay. But I think there  
16 is a high probability if you make all the assumptions  
17 to get to this point. But you also have to factor in  
18 the probability of actually having a fire, for the  
19 fire going that long, for the operators not taking any  
20 action. There are a lot of other things getting up to  
21 that point that when you put it all in context --

22                  MEMBER APOSTOLAKIS: That is why I'm  
23 confused. We are either doing deterministic analysis  
24 or we are doing risk analysis. If we do risk  
25 analysis, then, of course, we have to do all this. If

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1 we do what Rich said, then it seems to me they are  
2 gone.

3 I mean you have three hours. Everybody is  
4 burning, right? I think as I recall from the early  
5 studies on this the real question is whether you will  
6 have a short -- a hot short first before an open  
7 circuit.

8 MR. FRUMKIN: Right. Before the short  
9 ground.

10 MEMBER APOSTOLAKIS: That is the critical  
11 thing.

12 MR. FRUMKIN: Yes.

13 MEMBER APOSTOLAKIS: And this is not  
14 answering that, is it?

15 MR. FRUMKIN: Yes, it is.

16 MEMBER APOSTOLAKIS: It is?

17 MR. FRUMKIN: This is the likelihood of  
18 that spurious actuation probability, not a short to  
19 ground.

20 MEMBER APOSTOLAKIS: Okay.

21 CHAIRMAN WALLIS: This is one spurious  
22 actuation.

23 MR. FRUMKIN: This is a single.

24 CHAIRMAN WALLIS: A single one although  
25 there are multiple wires in the cable?

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1 MR. FRUMKIN: Right. Well, this is a  
2 spurious actuation getting cable to damage within a  
3 cable or between -- there is an inter-cable factors  
4 here -- between two cables. So the point -- let's  
5 just say the 0.6 here is for within a single thermoset  
6 cable, the 0.2 or the 0.4, as the 6850 has it, is  
7 between -- or generally it is 0.3 is what has been  
8 used a lot -- is between two separate thermoset cables  
9 within the same tray.

10 And what the previous slide was trying to  
11 say is that within a single thermoset -- within a  
12 single multi-conductor cable, that more than one of  
13 the conductors are going to fail together with an 80  
14 percent likelihood. So it almost for sure that if  
15 let's say you have one hot conductor and four control  
16 conductors that could actuate four different pieces of  
17 equipment, that hot conductor will come into contact  
18 probably with all of them with the same likelihood,  
19 with this same 0.6.

20 CHAIRMAN WALLIS: Oh, with the same  
21 likelihood?

22 MR. FRUMKIN: Yes. It's not a 0.6 times  
23 0.6 times 0.6 in the same cable. Within that cable it  
24 is 0.6 times 0.8, if you will.

25 CHAIRMAN WALLIS: Okay.

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1 MR. FRUMKIN: So it is still -- it is  
2 almost 0.6.

3 MEMBER DENNING: Why are the inter-cable  
4 probabilities the same for thermal plastic and  
5 thermoset?

6 MR. FRUMKIN: Because -- oh, you mean this  
7 and this?

8 MEMBER DENNING: Yes.

9 MR. FRUMKIN: Inter-cable -- yes, I'm not  
10 -- that's just a -- well, intra-cable is very likely  
11 --

12 MEMBER DENNING: Intra-cable, I understand  
13 that.

14 MR. FRUMKIN: Yes, I don't -- I don't have  
15 --

16 CHAIRMAN WALLIS: What is the question,  
17 Rich?

18 MEMBER DENNING: It's thermoset is less  
19 likely -- one would think thermoset would be less  
20 likely to have inter-cable and perhaps they are the  
21 same here because there just haven't been any  
22 experiments done on a thermoset.

23 MR. FRUMKIN: I think that is it because  
24 you can see that that is one of the big differences,  
25 a factor of two here, and again the same factor of two

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1 for intra-cable -- inter-cable -- but yes, we're -- as  
2 Roy Woods is here, and we're doing more testing on  
3 this. But this is currently the state-of-the-art data  
4 on this.

5 And I can't explain the -- it's just that  
6 is what the data showed from the limited 18 tests.

7 CHAIRMAN WALLIS: Now we are talking about  
8 whether you are doing probabilistic or deterministic  
9 analysis. When we get to the generic letter, there  
10 are strange terms such as saying the licensee must  
11 assume the possibility of simultaneous multiple  
12 spurious actuation -- well that tells me nothing.

13 I'm assuming the possibility -- it says  
14 nothing about whether it is likely to be one or 0.6 or  
15 whatever.

16 MEMBER DENNING: What they are saying is  
17 one.

18 CHAIRMAN WALLIS: What does it mean?

19 MEMBER DENNING: It means one.

20 CHAIRMAN WALLIS: So possibility means a  
21 probability of one?

22 MEMBER DENNING: That's -- yes.

23 CHAIRMAN WALLIS: That wasn't clear to me  
24 at all. Okay.

25 MEMBER APOSTOLAKIS: We will come to the

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1 letter, I guess.

2 MEMBER DENNING: Yes. Continue.

3 MR. FRUMKIN: These are just some notes on  
4 the previous slide that some of the plants that use  
5 the CPTs, which are the control power transformers,  
6 that reduces the likelihood of spurious actuations.

7 MEMBER APOSTOLAKIS: All of these  
8 probabilities, of course, mean nothing now.

9 MR. FRUMKIN: Right, yes.

10 MEMBER APOSTOLAKIS: They are one.

11 MR. FRUMKIN: Okay. Well --

12 MEMBER DENNING: But we are going to get  
13 to risk informing at some point here.

14 MR. FRUMKIN: Absolutely. Right. So  
15 those were just notes on the previous slide which was  
16 unfortunately put in here.

17 In conclusion, a review of the test data  
18 readily illustrates that hot shorts often involve more  
19 than one conductor. And that concurrent hot shorts  
20 within a cable are probable and should be considered  
21 during circuit analysis.

22 That's the end of this presentation. And  
23 the point of this is just to lay the groundwork that  
24 simultaneous spurious actuations and simultaneous  
25 multiple spurious actuations have been shown by

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1 testing, by industry testing, to occur.

2 MEMBER DENNING: Now there is more testing  
3 that is in progress. It is your feeling that that  
4 testing could then -- will it be done within a time  
5 period where we add value to the licensee when the  
6 licensee is basically responding the generic letter?

7 MR. FRUMKIN: Yes, that testing is planned  
8 to be done by the end of the year. And that pool of  
9 data will be available -- certainly for risk-informed  
10 evaluations for the licensees to use. But the experts  
11 doing the testing don't believe that there is going to  
12 be -- they believe these numbers are going to be  
13 honed.

14 They believe that there are going to be  
15 more cable combinations tested here than in the 18  
16 EPRI tests -- EPRI/NEI tests. But they don't believe  
17 that for the information that was on that table are  
18 going to be changed by an order of magnitude. It's  
19 maybe a 50 percent change or something of that nature.

20 MEMBER DENNING: If we have time later on,  
21 could we have a short presentation by someone about  
22 what is still to happen? And what different  
23 configurations basically have been untested at this  
24 point that will be tested?

25 MR. FRUMKIN: Well, Roy Woods is sitting

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1 behind you. And I'm not sure if he is prepared to  
2 talk about this testing.

3 MEMBER DENNING: Let me say I'm not asking  
4 for you to do it right now. But do you think you  
5 could do it later?

6 MR. WOODS: Sure. Roy Woods, RES. Yes,  
7 certainly we can make a presentation to you whenever  
8 you want on the testing. The plans are well made. We  
9 are about to start within days or a week at most. It  
10 is actually about to happen.

11 MEMBER DENNING: Okay. Well, let's go  
12 ahead --

13 MR. FRUMKIN: I think they want something  
14 later this morning, right?

15 MEMBER DENNING: Yes, later this morning.  
16 Absolutely, yes. Later this morning.

17 MEMBER APOSTOLAKIS: That's what happens  
18 when you have three hours.

19 MEMBER DENNING: Right, yes. Thanks. Can  
20 you run any of those tests by eleven?

21 MR. WOLFGANG: My name is Bob Wolfgang.  
22 I'm a fire protection engineer in NRR. And I'm going  
23 to give you information on the draft generic letter  
24 Post-Fire Safe-Shutdown Circuit Analysis Spurious  
25 Actuations.

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1           A summary of the presentation, I'll go  
2 over the purpose of issuing the generic letter, the  
3 information we are requesting from licensees, the  
4 background on this issue since 1997, the basis for the  
5 generic letter, the issue that is clarified in the  
6 generic letter, public comments, and a summary at the  
7 end.

8           The purpose of issuing the generic letter  
9 is to clarify how the NEI/EPRI cable fire test program  
10 reaffirms long-held regulatory positions and provide  
11 part of a foundation for licensees who are planning to  
12 transition to NFPA 805.

13           Also, to respond to the Agency's need to  
14 provide clarification and closure of outstanding fire  
15 protection issues, respond to --

16           MEMBER APOSTOLAKIS: Excuse me. Are you  
17 going to come back to these? I mean this on slide 16,  
18 the foundation for licensees planning to transition,  
19 will you elaborate on these later? Or can you tell us  
20 a few words now?

21           MR. WOLFGANG: Well, that's --

22           MEMBER APOSTOLAKIS: Why is that relative  
23 to NFPA 805?

24           MR. WOLFGANG: This is just to show that  
25 multiple spurious actuations should be included in

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1 their risk analysis model.

2 MEMBER DENNING: Well, since George has  
3 raised the question, let me ask it now. And that is  
4 NFPA 805 is one of the ways -- transitioning to NFPA  
5 805 is one of the ways that a licensee can respond to  
6 this. Now my question is how long does it take to  
7 transition to NFPA 805?

8 And I don't quite understanding within the  
9 time periods of the 90 days and six months and this  
10 kind of stuff, within the context of a transition to  
11 NFPA 805, when did that transition actually have to  
12 occur for the licensee to be able to use that pathway?

13 MR. WOLFGANG: All they have to do is  
14 respond to us within I believe it is the 90 days.  
15 That they are transiting to NFPA 805. And they will  
16 take care of this situation during that process.

17 MEMBER DENNING: Then how long would they  
18 have to transition to NFPA 805?

19 MR. WOLFGANG: They have -- what is it?  
20 Is it three years?

21 PARTICIPANT: Three years.

22 MEMBER DENNING: Three years?

23 MEMBER APOSTOLAKIS: Yes, it is a long  
24 time.

25 MR. KLEIN: Let me describe briefly. This

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1 is Alex Klein. Let me briefly describe the process a  
2 licensee would use if he wants to transition to NFPA  
3 805. And that is once the licensee had made the  
4 determination that he does want to transition to 805  
5 because that is an option for him, if he submits a  
6 letter of intent to the agency indicating that that is  
7 what he wishes to do.

8 At that point, we review that letter and  
9 make a determination as to whether or not the schedule  
10 that the licensee has laid out is acceptable to the  
11 Agency. And what we have right now in place is a  
12 three-year time frame for licensees to transition with  
13 the option of extending that time frame if the  
14 licensee can provide us with sufficient justifications  
15 beyond the three-year time period.

16 Now within that three-year time period, a  
17 licensee would submit their letter of intend, do the  
18 act of transition into NFPA 805. And then before that  
19 three-year time period is over, we would submit their  
20 license amendment to the staff for our review and  
21 approval prior to them actually receiving the  
22 amendment.

23 MEMBER APOSTOLAKIS: It seems to me that  
24 the -- actually is the first bullet in the previous  
25 slide that is important because the licensee that

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1 wants to transition to NFPA 805 has to convince you,  
2 I think, that they complied with all the regulations,  
3 right? There may be a few exceptions, as I remember  
4 for a period of time, and all that.

5 So the primary reason seems to be to  
6 reaffirm long-held regulatory positions because  
7 somebody who wants to transition has to demonstrate  
8 that they complied with all that.

9 MR. KLEIN: That is correct. Really I  
10 think the primary purpose of the generic letter is  
11 that first bullet on that slide 16.

12 MEMBER APOSTOLAKIS: Right, right.

13 MR. KLEIN: Yes. As an added benefit, it  
14 does provide the foundation for licensees who want to  
15 transition to 805.

16 MEMBER DENNING: Now wait a second. I  
17 definitely did not understand this. I mean clearly  
18 there are a lot of licensees out there that did not --  
19 cannot respond to multiple spurious actuations. And  
20 they are not going to have to bring their plant into  
21 compliance with having to meet all the multiple  
22 spurious actuations before going to NFPA 805 because  
23 then NFPA 805 doesn't help them at all, right?

24 MR. FRUMKIN: Yes, that is correct. And  
25 what Dr. Apostolakis was saying is correct is that we

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1 have an enforcement discretion in place so those  
2 licensees who discover during transitions that they  
3 are not in compliance can do a risk analysis of that  
4 and determine that it is not red, that it is not  
5 wilful, that it is not a severity one violation.

6 And, therefore, they can comp it -- put  
7 compensatory actions in place and move forward towards  
8 transition without necessarily correcting that in  
9 accordance with the old fire protection program.

10 MEMBER DENNING: But one thing that I  
11 think is an issue though and that is suppose there is  
12 a plant out there that would really like to do the  
13 NFPA 805 approach but within the 90-day period, don't  
14 they have to go through the entire analysis and  
15 identify the SSCs that are potentially vulnerable  
16 based upon this detailed multiple spurious actuation  
17 evaluation which seems to me like an extremely  
18 difficult problem to undertake.

19 Is that true that they have to really  
20 analyze the whole system within 90 days according to  
21 this multiple spurious actuations and identify  
22 vulnerable SSCs? Am I correct or not correct?

23 MR. WOLFGANG: Well, they have to -- well,  
24 I'll get to that on a slide here.

25 MEMBER DENNING: Okay, if you will get to

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1 it, you can go ahead.

2 MEMBER MAYNARD: I would like to challenge  
3 that first statement just a little bit though. And I  
4 know that it has been a long-held position by members  
5 of the staff but as far as, you know, NRC position,  
6 there are a number of licenses that were issued and  
7 plants inspected and with their programs were approved  
8 and licensed without making this assumption.

9 And I'm not convinced that it has clearly  
10 been a recognized regulatory requirement. And again,  
11 I know licenses were issued, programs were reviewed  
12 without making -- otherwise, we wouldn't even be here  
13 today if those licenses weren't issued at that time.  
14 So I would challenge that. The first statement.

15 MR. WOLFGANG: We know SERs have been  
16 issued for Byron and Braidwood with a single spurious  
17 actuation per fire event. And we've come to the  
18 conclusion basically that was issued as a mistake.  
19 That was a mistake.

20 MEMBER MAYNARD: But I know that there are  
21 a lot of plants out there a license. Their analysis  
22 were reviewed, their programs were reviewed. I know  
23 I was personally involved with them back in the '80s  
24 when some of these issues were starting to come to a  
25 highlight. And I know that there are a number of

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1 plants out there with licenses that although it may  
2 not be documented as clearly, that it was known that  
3 multiple spurious actuations were not taken in account  
4 in that analysis.

5 I don't think it is clear that this is  
6 just confirming compliance to requirements that were  
7 in place. I think it is a different set of  
8 assumptions.

9 MR. FRUMKIN: Yes, and this may, I agree  
10 that your assumptions apply to probably a number of  
11 plants out there. But for the most part, Appendix R,  
12 10 CFR 50, Appendix R, Section 3(g)(ii) and 3(g)(ii)  
13 which is the alternate and dedicated shutdown are what  
14 is in question.

15 The NRC went in and did an analysis of the  
16 3(g)(iii) alternate shutdown. And for a lot of  
17 3(g)(iii) which is, for lack of a better description,  
18 a control room abandonment, they allowed the  
19 assumption of one spurious actuation. 3(g)(ii) wasn't  
20 across the board inspected in the 80s. It was assumed  
21 that licensees could wrap or protect or would have  
22 adequate separation.

23 And it wasn't evaluated for multiple  
24 spurious because generally the staff didn't believe  
25 that -- well, I'm not sure why they didn't do it. But

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1 the big question was this alternate shutdown.

2 And in the 90s, we had the thermal lag.

3 And a lot of that wrap was taken out. And a lot of  
4 manual actions or assumptions were put into place.

5 And I don't mean to say that there was -- well, the  
6 point that I am trying to make is that there was  
7 another change. There was the removal of a lot of  
8 these thermal lag which was relied on to protect  
9 cables and probably would have mitigated many spurious  
10 actuations, many multiple spurious.

11 MEMBER MAYNARD: And I'm not saying at  
12 this point that they shouldn't be considered now. I'm  
13 challenging the regulatory positions that says all  
14 along everybody should have always done this. I think  
15 that, you know, we're now setting, you know, these are  
16 the things that definitely need to be considered.

17 If those were considered 20, 30 years ago,  
18 if that was part of the regulatory position for the  
19 licenses, we wouldn't have gone through a 20-year  
20 period here of trying to figure out what it really  
21 requires the licensee to do. Again, it's a regulatory  
22 -- I believe that this is something that falls within  
23 the backfit.

24 It needs a better analysis overall. And  
25 that doesn't mean that it is a bad thing to do. I'm

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1 just saying that I do not believe that we can take the  
2 position that this is a requirement that has already  
3 been there, that everybody should have already done.  
4 And that is kind of what we are saying in this generic  
5 letter.

6 MR. KLEIN: This is Alex Klein of NRR. I  
7 just wanted to add to the discussion here that -- and  
8 Bob can clarify this also for me -- is that the  
9 generic letter did receive CRGR approval. We did go  
10 to that Committee.

11 There are subsequent slides in Bob's  
12 presentation, I think 23, 24, 25, that does talk  
13 about the background, the regulatory background that  
14 you are speaking of that might clarify some of these  
15 discussion questions.

16 MEMBER MAYNARD: I'd be glad to look at  
17 that.

18 MR. WOLFGANG: Well, and also attend CFR  
19 Part 50, Appendix R, it also talks about you have to  
20 consider hot shorts. It doesn't set a limit on the  
21 number.

22 MEMBER MAYNARD: Well, I understand that.  
23 But there is a number of the regulations that come to  
24 an agreement between the licensee and staff as to what  
25 are -- what do you have to assume in a number of those

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1 things.

2 So anyway, we will get into it maybe aq  
3 little more with the regulatory evaluation. But I do  
4 not agree that --

5 CHAIRMAN WALLIS: Well, could we clarify  
6 this first bullet? I mean it seems to me that if we  
7 did have this long-held regulatory position, which was  
8 being enforced, then you wouldn't need this generic  
9 letter.

10 MEMBER MAYNARD: Right.

11 CHAIRMAN WALLIS: So something has changed  
12 as the result of these tests. So maybe there was a  
13 position which wasn't very well enforced or something  
14 or was not properly interpreted by the industry. Is  
15 that the problem?

16 MEMBER MAYNARD: Or the staff?

17 CHAIRMAN WALLIS: Well, the staff, yes.

18 MR. FRUMKIN: Well, I think we -- well,  
19 Bob, I think I would say that something did change.  
20 And that thing may not have been entirely the tests.  
21 I think that the staff had high confidence that these  
22 fire barriers that were installed were separating  
23 these redundant trains.

24 And they were removed and they were  
25 replaced with non-barrier solutions which were

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1 analysis, manual actions, and those type of things.  
2 And as soon as the NRC started inspecting post-thermal  
3 lag fixes, which was in 1997, well before these tests.  
4 We had numerous -- there was an information notice  
5 97-something which presented numerous hot short and  
6 multiple -- well, numerous alternate associated  
7 circuits and circuit failure type issues.

8 So to hang this entirely on the test is  
9 not -- certainly the staff position goes before -- to  
10 before the tests. And that has been documented in  
11 that generic -- that information notice and there was  
12 a letter sent to NEI which expressed this sentiment  
13 well before -- I believe that was before the test as  
14 well.

15 CHAIRMAN WALLIS: The purpose of the  
16 generic letter is to reinforcement your enforcement  
17 which you were a bit lax about before or something?  
18 Is that what its purpose is?

19 MR. WOLFGANG: There was a lot of  
20 confusion. You were talking about 3(g)(iii) about  
21 alternative and dedicated shutdown systems and the use  
22 of one only -- you had to consider one spurious  
23 actuation there --

24 MR. FRUMKIN: Right, 3(g)(iii) and the  
25 Generic Letter 86-10 talked about spurious actuations

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1 quite a bit but the staff position is that those  
2 didn't apply to 3(g)(ii) and they were erroneously  
3 applied to 3(g)(ii), which is all we're really talking  
4 about right now. We are not talking about these 3(g)  
5 (iii) inspections that occurred in the 80s. We're not  
6 talking about the 3(g)(iii) approvals.

7 Every 3(g)(iii) program should have been  
8 approved with an SER. That was the policy. But we  
9 did not go into the 3(g)(ii) areas because the  
10 barriers and those solutions should have been  
11 sufficient.

12 MEMBER MAYNARD: It just seems to me that  
13 with all the confusion that has gone on for a number  
14 of years on this, a much cleaner way of doing this is  
15 if the NRC believes that this is something that needs  
16 to be done is just to come out with it as a  
17 requirement following the process for rulemaking, for  
18 changes, or whatever rather than trying to handle it  
19 through a generic letter requesting information to  
20 show compliance with a very confusing set of  
21 requirements.

22 MEMBER-AT-LARGE SIEBER: I suspect,  
23 though, that the staff does not believe that  
24 rulemaking is required, that the proper regulations  
25 already exist.

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1 MR. FRUMKIN: That is correct.

2 MEMBER-AT-LARGE SIEBER: In the review  
3 process that the staff has used in the past does not  
4 establish new regulations. The regulations are the  
5 regulations. And how the staff reviews something is  
6 another matter.

7 MEMBER MAYNARD: Well, how they review it  
8 but what it is accepted as to your certain assumptions  
9 and things --

10 MEMBER DENNING: I'm sure we are going to  
11 come back to this issue. So why don't you go ahead --

12 MEMBER-AT-LARGE SIEBER: It won't go away.

13 MR. WOLFGANG: Okay, moving to the next  
14 slide, more purposes of issuing a generic letter,  
15 respond to the Agency's need to provide clarification  
16 and closure of outstanding fire protection issues,  
17 respond to the licensee's request to provide  
18 clarification of regulatory expectations, and respond  
19 to the region's request to provide clarification of  
20 regulatory expectations for circuit inspections. And  
21 circuit inspections were resumed January 2005.

22 Generic letter, what information it is  
23 requesting from the licensees. Within 90 days to  
24 evaluate their licensing basis and information in the  
25 generic letter regarding multiple spurious actuations

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1 in the Post-Fire Safe-Shutdown Circuit Analysis.

2 MEMBER MAYNARD: Is that practical to  
3 expect -- I think we might get into a little bit more  
4 as to what we are really asking here but within 90  
5 days, for the whole industry to do this, I'm sure  
6 there is going to be some resources -- external  
7 resources needed in some cases.

8 With the whole industry trying to use  
9 those, is 90 days really a practical time frame to get  
10 what is really being asked for here?

11 CHAIRMAN WALLIS: Well, we believe that it  
12 is. But, you know, I guess when NEI talks, they have  
13 a consensus from the industry that it is not a  
14 sufficient time, We can always adjust that.

15 MR. WOLFGANG: Yes, I think what is being  
16 asked here is not for the technical evaluation of the  
17 entire circuit analysis. What we are asking for is  
18 for licensees to report whether they have a multiple  
19 spurious licensing basis or they have a single  
20 spurious licensing basis.

21 For those plants that have a multiple  
22 spurious and haven't analyzed for multiple spurious,  
23 then that is going to be a long-term fix. All we are  
24 asking them to do is to report their situation within  
25 90 days, which is a licensing --

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1                   MEMBER DENNING: Wait a second. How do  
2 they submit their functionality assessment of effected  
3 SSCs without doing that total analysis? Am I missing  
4 something here? And this is within 90 days, if  
5 you're not in compliance, you have to submit this  
6 functionality assessment of effected SSCs.

7                   MEMBER APOSTOLAKIS: And compensatory  
8 measures.

9                   MEMBER DENNING: And compensatory  
10 measures. I think that is the whole analysis, isn't  
11 it? I mean you don't necessarily know how you are  
12 going to ultimately correct them but it seems to me  
13 that the analysis has to be done in 90 days.

14                   Incidentally, I should have mentioned that  
15 listening in is EPM, which is a company that does this  
16 kind of stuff. But I should have mentioned that  
17 earlier that we do have an open line here.

18                   I'm sorry, go ahead.

19                   MR. WOLFGANG: Yes, what we are asking --  
20 yes, to submit the functionality assessment of  
21 effected SSCs.

22                   MEMBER DENNING: Yes. How do you  
23 determine what SSCs are effected unless you have  
24 looked at the multiple spurious actuations.

25                   MR. WOLFGANG: Yes, they have to look at

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1 the multiple spurious actuations.

2 MR. FRUMKIN: First, I agree with the  
3 member that doing a full analysis for 104 plants in 90  
4 days is not going to be credible. This is a major  
5 effort to look at that.

6 I believe though that the second bullet of  
7 compensatory measures for these areas where the plants  
8 are capable of putting compensatory measures and then  
9 solving the problems in a long-term program. That is  
10 credible. That is possible.

11 MEMBER APOSTOLAKIS: It seems to me that  
12 the 90 days applies to the first bullet but not the  
13 sub bullets.

14 MEMBER MAYNARD: I think it does a -- it  
15 certainly applies to the first bullet.

16 MEMBER DENNING: But the sub bullets are  
17 there in the generic letter.

18 CHAIRMAN WALLIS: Well, why is there an  
19 assumption that they are not in compliance now? I  
20 mean that they have done various things today to meet  
21 the regulations already. And their position would  
22 probably be we are in compliance now. So what are you  
23 asking us to do?

24 MEMBER DENNING: No, I don't think so.

25 MEMBER-AT-LARGE SIEBER: Well, if you took

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1 the lag out of your plant --

2 CHAIRMAN WALLIS: That's the problem.  
3 They have changed something.

4 MEMBER-AT-LARGE SIEBER: You changed the  
5 configuration.

6 CHAIRMAN WALLIS: That is okay. So they  
7 have changed something. Thank you.

8 MEMBER DENNING: It is not just that,  
9 Graham. They have argued that this has not been the  
10 requirement. That you didn't have to do multiple  
11 spurious actuations. They did one at a time or a  
12 single. So they would argue this is not the  
13 regulatory -- they would argue that it is new  
14 requirement but kind of like Otto has.

15 MEMBER KRESS: But the regulation says  
16 broadly that under these conditions, you have to have  
17 one train of safe shutdown. And that can only be  
18 interpreted as multiple spurious actuation I think.

19 MEMBER MAYNARD: I don't think -- I don't  
20 agree with that. Through the regulatory process, you  
21 don't necessarily have to assume everything that  
22 anybody could ever conceivably come up with. And so  
23 that's why the NRC and the industry -- but you decide  
24 on a set of assumptions. And what you really have to  
25 assume to reasonably meet that requirement.

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1           And then as new information comes along,  
2           if those previous assumptions weren't conservative  
3           enough, you may need to do that. But that really  
4           constitutes a change there. Otherwise why would you  
5           have any guidance documents or any -- what is allowed  
6           to assume or whatever. So I would argue that it is  
7           part of it.

8           MEMBER DENNING: In some respect, this is  
9           an open-ended problem in terms of, you know, and so it  
10          begs for some kind of guidance as to where you end the  
11          search for things that can go wrong.

12          Continue.

13          MR. WOLFGANG: We are asking that within  
14          six months to submit the plan to return all effected  
15          SSCs to compliance with the regulatory requirements.  
16          And that is the plant modifications, license .  
17          Exemption request.

18          And we are also asking that within 30  
19          days, if you cannot meet the 90-day, six month  
20          schedule that we are requesting, you provide us  
21          notification you cannot meet it and your suggested  
22          schedule and completion date.

23          CHAIRMAN WALLIS: What kind of things  
24          would they do to come into compliance? Are they going  
25          to change these offending cables? Are they going to

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1 change the way in which they put out fires? Are they  
2 going to change the actual equipment in the SSC? It  
3 is very open ended what they are expected to do.

4 MR. WOLFGANG: Yes, they can protect  
5 cables. They can reroute cables. They can submit  
6 license amendments based on a risk analysis method --  
7 those type of things.

8 CHAIRMAN WALLIS: Manual actions?

9 MR. WOLFGANG: Well, not in 3(g)(ii)  
10 space. There are a lot of ways.

11 MEMBER DENNING: I don't know how  
12 expensive those ways are. I mean we say there are  
13 lots of ways but those ways may be extremely  
14 expensive.

15 CHAIRMAN WALLIS: Well, I'm also unclear  
16 about what it is they are supposed to assume can go  
17 wrong? When I read these things about they are  
18 supposed to assume the possibility that this can  
19 happen, it goes back to Otto's question here.

20 I mean if you assume the very worst that  
21 could possibly happen, then you could have enormous  
22 changes in the plants in order to avoid this worst  
23 conceivable thing. Is that what you are asking them  
24 to do?

25 MR. WOLFGANG: You have to assume all

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1 multiple spurious actuations.

2 CHAIRMAN WALLIS: Well, but that is a  
3 major thing, isn't it?

4 MEMBER MAYNARD: That is major.

5 CHAIRMAN WALLIS: You have to assume that  
6 it happens with the probability of one?

7 MR. WOLFGANG: Yes.

8 MEMBER-AT-LARGE SIEBER: Yes. On the  
9 other hand --

10 MR. WOLFGANG: 3(g)(ii) in deterministic  
11 space doesn't limit the number of --

12 MEMBER-AT-LARGE SIEBER: On the other  
13 hand, you restrict the fire to a single fire area,  
14 which means that if you have appropriate separation or  
15 fire barriers that you have a train that is free of  
16 fire, that will operate.

17 MR. WOLFGANG: Right.

18 MEMBER-AT-LARGE SIEBER: And that is the  
19 principle. I think it is going to vary dramatically  
20 from plant to plant, especially based on the age of  
21 the plant and the type of plant. I think some are  
22 going to be tremendously impacted. Some others may  
23 not. And again, depending on what assumptions you  
24 really have to make and what credit you can take for  
25 things you already have in place, things that have

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1 already been done, everything from operator actions to  
2 fire loadings, improvement in fire control,  
3 everything.

4 MEMBER DENNING: And, Jack, you talked  
5 about the separating of trains. And that's, you know,  
6 pretty straight forward. But isn't the real open  
7 endedness related to the spurious actuations where  
8 there is some unanticipated valve opens that effective  
9 give you a loss of coolant accident or something like  
10 that, that, you know, introduces a different element  
11 to safe shutdown. Isn't that the open-endedness that  
12 makes it so difficult.

13 And I also don't know whether -- how many  
14 plants really know what cables are in what trays  
15 within a room.

16 Obviously if you are going to do -- yes so  
17 that you basically are assuming anything within the  
18 room -- I mean you know that -- you have concluded  
19 that it has gone through a room up to this point.  
20 But, you know, they could be in totally different  
21 trays in the room. But you don't know where they are  
22 in the room.

23 CHAIRMAN WALLIS: Well, you have to assume  
24 that they are all together and they are all --

25 MEMBER DENNING: Assume that you have to

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1 submit it. But I don't know the answer to that.

2 MEMBER KRESS: Assume that you have to do  
3 it. But I don't know the answer to that.

4 MR. WOLFGANG: Well in a fire area in a  
5 room, if you assume a fire, you have to assume  
6 everything is --

7 MEMBER KRESS: Yes, but can everything  
8 have an inter --

9 CHAIRMAN WALLIS: Everything in that room  
10 can short together?

11 MEMBER KRESS: -- can it short together as  
12 an inter-cable connection even though it may be way  
13 separated?

14 MR. FRUMKIN: No, if it couldn't occur,  
15 then it wouldn't be -- I mean you wouldn't have -- we  
16 wouldn't be expecting energized cables to penetrate  
17 conduits. We wouldn't expect energized cables to jump  
18 from tray to tray.

19 Or, for example, DC current has to have  
20 the same path. If it is not in the same tray or same  
21 conduit you couldn't actuate that from an AC circuit  
22 or something of that nature.

23 MEMBER DENNING: I don't know whether --  
24 what utilities know what cables --

25 MR. FRUMKIN: Right, no, you are correct.

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1                   MEMBER DENNING: -- are in what trays you  
2 were going to run.

3                   MR. FRUMKIN: And that can be a very  
4 significant effort.

5                   One of the aspects is that for the  
6 3(g)(ii) area -- or for the 3(g)(iii) plants, some of  
7 the older plants are 3(g)(iii). And they don't have  
8 very much separation at all. But they have done a  
9 significant analysis that was reviewed in the 80s  
10 which we referred to earlier. And they do have the --  
11 because they have done that detailed analysis, they  
12 have the flexibility to do manual actions.

13                   So in effect, the newer plants with the  
14 good separation should be fairly well off. The older  
15 plants that had very little separation probably have  
16 done a lot of this analysis already and may already be  
17 in compliance.

18                   It is the middle plants that are more  
19 likely than the older plants to have the circuits  
20 traced. But they are kind of in the middle there.  
21 And they are the ones who I think are going to be  
22 having a more difficult time answering this generic  
23 letter.

24                   MEMBER-AT-LARGE SIEBER: That is a pretty  
25 limited number of plants then. This issue is, you

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1 know, I was a young man when this issue came out. The  
2 work has been done. And the plants that were built in  
3 the 80s, to my knowledge they all had pull tickets  
4 associated with cables when they were originally  
5 routed.

6 So you just run your computer and it tells  
7 you whether you've got separation or not. And if you  
8 don't, what circuits are offending circuits.

9 MR. FRUMKIN: Many plants have that. Or  
10 some plants have that.

11 MEMBER-AT-LARGE SIEBER: Some plants have  
12 it. Some plants had to do that all manually, hand  
13 over hand.

14 MR. FRUMKIN: But I just want to add one  
15 thing that the staff has come our with a statement --  
16 or, well, not really a statement but what 3(g)(ii)  
17 says is that when cables of the redundant trays are  
18 within the same fire area and are not protected, so if  
19 you have a area with train A equipment in it and no  
20 train B equipment or the train B is protected in  
21 accordance with 3(g)(iii) protection criteria, we're  
22 not -- so with the train B protected, we're not  
23 limiting the actions that -- the feasible and reliable  
24 actions for failures on train A.

25 So if you have a protected train outside

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1 of a fire area or protected with 3(g)(ii), the  
2 licensees can do feasible and reliable manual actions  
3 on the fire-effected train to let's say close that  
4 valve that opens spuriously or stop that pump that  
5 opens spuriously because there is a full -- typically  
6 from the control room, so there is good annunciation  
7 and indication, there is a full protected train  
8 outside of that fire-effected area.

9 And I'll just point to Alex and see if he  
10 nods at me. Okay, yes.

11 MEMBER-AT-LARGE SIEBER: And there is very  
12 limited amounts of equipment if you had a spurious  
13 actuation, would cause another accident like a LOCA.  
14 Some value opens in the valve is -- like a safety  
15 injection valve, is designed to pump in not pump out.

16 Okay, so there are check valves and things  
17 like that that would prevent that. But there area  
18 few cases -- PRVs for example --

19 MR. FRUMKIN: Yes, PRVs is one I was  
20 thinking of if you --

21 MEMBER-AT-LARGE SIEBER: Yes , that could  
22 open and --

23 CHAIRMAN WALLIS: New plant designs have  
24 this screw valves. And the spurious actuation of them  
25 create a LOCA.

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1 MEMBER-AT-LARGE SIEBER: Yes, but they  
2 have them so you get to a safer condition, right?

3 CHAIRMAN WALLIS: One question I was going  
4 to --

5 MEMBER-AT-LARGE SIEBER: It is just  
6 expensive to do it.

7 MEMBER DENNING: Yes, is there any kind of  
8 assessment as to what fraction of spurious actuations  
9 actually are deleterious as far as effecting safe  
10 shutdown capability? I mean has anybody in a risk  
11 study done that kind of an assessment? Or do you have  
12 any feeling as to the fraction of spurious actuations  
13 that will get you into trouble?

14 MR. FRUMKIN: Well, you asked for that.  
15 We have this bounding analysis that we did and you  
16 actually -- well, you have to look at a lot to find  
17 the ones that are going to give you problems from a  
18 spurious actuation standpoint. But in our bounding  
19 analysis, it took five pairs of spurious actuations in  
20 order to get a significant risk.

21 And it is because these spurious system --  
22 these multiple spurious effect systems that, you know,  
23 are the redundant train. So it effects both -- the  
24 train, the productive train or the unprotected train,  
25 and the redundant train so you really lose all your

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1 protection with these scenarios. And it doesn't --  
2 you have to look at a lot to find the bad players.  
3 And there don't actually have to be a lot of bad  
4 players, at least based on our bounding analysis for  
5 it to be of fairly high risk significance.

6 MEMBER DENNING: Continue please.

7 MR. WOLFGANG: Background since 1997,  
8 multiple LERs brought lack of consensus concerning  
9 circuits to the staff's attention. And this led to a  
10 moratorium on inspection of circuit issues back in  
11 1997.

12 In 2001, NEI/EPRI cable fire test  
13 demonstrated that multiple spurious actuations can  
14 occur. And they can occur in rapid succession or  
15 simultaneously without sufficient time for mitigation  
16 in between.

17 Therefore if a licensee doesn't account  
18 for multiple spurious actuations, and its circuits  
19 analysis, the licensee may not be in compliance with  
20 10 CFR 50.48 and 10 CFR Part 50, Appendix A, General  
21 Design Criteria, and (3) which require that a licensee  
22 provide and maintain free from fire damage, one train  
23 of systems necessary to achieve and maintain the safe  
24 shutdown.

25 Staff has developed the risk-informed

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1 approach to inspections to focus on risk-significant  
2 configurations based on the cable fire test. And this  
3 is RIS 2004-003.

4 MEMBER DENNING: Now let me ask with  
5 regard to that, I understand that that was prepared  
6 for inspection as opposed to compliance.

7 MR. WOLFGANG: Correct.

8 MEMBER DENNING: But is there a real  
9 reason why one couldn't use guidance of that type for  
10 compliance as well? Do you see a regulatory  
11 constraint that would prevent you from -- I mean from  
12 the regulations that exist now, do you think it would  
13 be incompatible for the staff to provide the  
14 equivalent, perhaps a perturbation off of that or  
15 perhaps a revision to NEI's risk-informed guidance?  
16 Why can't we do that?

17 MR. WOLFGANG: I think the thing is we  
18 haven't seen licensee's risk tools, their model that  
19 we would have to approve prior to them using any risk  
20 analysis.

21 MR. KLEIN: Let me take a shot at  
22 answering the question maybe at a higher level. And  
23 that is with respect to licensees who are required to  
24 meet the requirements of Appendix R. Don't today have  
25 the ability to change that regulation or the

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1 commitment to that regulation based upon risk  
2 information.

3 If they want to do that, they would have  
4 to seek an exemption request from us against the  
5 regulation. They may certainly use risk information if  
6 they want to come in and see us with an exemption  
7 request, that is certainly open to them.

8 But what I think Bob is indicating is that  
9 a licensee may not make a change in their plant using  
10 risk information and making the conclusion based upon  
11 their standard license condition that says that, you  
12 know, it doesn't effect their ability to achieve and  
13 maintain safe shutdown.

14 The staff has been telling licensees that  
15 we would like them to come in and see us for such an  
16 exemption request or a license amendment.

17 MEMBER DENNING: Yes, I understand that  
18 that is the way -- that is the process by which they  
19 would use risk information to do that. But this first  
20 bullet is generic. It is generic information as to  
21 how many combinations of things or what are kinds of  
22 situations that are -- could be expected to be risk  
23 significant?

24 Now I realize it is not totally complete  
25 but it, you know, it gave guidance to the inspectors

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1 as to what are the combinations of things that could  
2 risk significant to look at and make sure. And I  
3 don't see any reason why one couldn't effectively rule  
4 out some of this total space of situations that the  
5 applicant has to look at to be compliant.

6 Now, you know, Tom is saying -- and I  
7 think it is kind of the regulatory position that  
8 you've got to look at everything because anything that  
9 can prevent this safe shutdown pathway is a potential  
10 problem. But you used it for the inspector to give  
11 him guidance on what is risk important and not in the  
12 area.

13 Couldn't you have done the same to provide  
14 generic guidance on this is how far you have to go in  
15 this process of looking at multiple spurious  
16 actuations.

17 MR. FRUMKIN: Bob, let me -- I'll be  
18 candid. We tried very hard to read 3(g)(ii) as a --  
19 to be risk informed in the way you describe. And with  
20 help from our lawyers, we were unable to get there for  
21 those pre-`79 plants. And then there is also the  
22 Agency or the Commission has approved a risk-informed  
23 rule.

24 And although it is more comprehensive,  
25 that is out there. And we considered the possibility

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1 of a risk-informed changed to this rule, to the  
2 current 3(g)(ii), and there is currently a rule that  
3 has been promulgated by the Commission. So that did  
4 not seem like a credible approach.

5 CHAIRMAN WALLIS: Well, could I follow up  
6 on that? And I looked at this risk informed approach.  
7 It seems to be just advice on vendors --

8 MR. FRUMKIN: Yes?

9 CHAIRMAN WALLIS: -- to focus on certain  
10 configurations. Well, that's okay. Focus on what  
11 matters. But then how does this inspector decide to  
12 reach some sort of a finding that something is not  
13 adequate? Or is not in compliance. That would get  
14 closer to tying these things together because the  
15 whole question here is what do they have to do in  
16 order to be in compliance.

17 MR. FRUMKIN: That is correct.

18 CHAIRMAN WALLIS: And how does the  
19 inspector know when they are in compliance or not?  
20 Well, he has just chose to focus on these things. How  
21 does he then decide when he is focused whether or not  
22 they are in compliance?

23 MR. FRUMKIN: And the answer to that is  
24 they pull up the licensing basis and if the licensing  
25 basis, if they do not have -- are not licensed for

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1 single spurious, that are considered to be -- required  
2 to look for multiple spurious.

3 CHAIRMAN WALLIS: Well then what are they  
4 supposed to do?

5 MR. FRUMKIN: Then that would be -- that  
6 could be -- that would be a finding would be run  
7 through the risk analysis of this STP. It would be  
8 cited. And the licensee would have to resolve a  
9 finding in the normal manner.

10 MEMBER DENNING: Incidentally, I think  
11 your last statement about their legal interpretation  
12 of pre-`79 is very important as far as our  
13 considerations are concerned because I mean it could  
14 be indeed that we are in a box in terms of whether you  
15 can risk inform the current regulation or whether you  
16 would need to change a rule which is obviously a huge  
17 undertaking.

18 CHAIRMAN WALLIS: Well, I'm really  
19 wondering, you made an initial statement that we  
20 should have had a subcommittee meeting. We seem to be  
21 at the level of behaving like a subcommittee so trying  
22 to determine whether or not you are ready to go to the  
23 full Committee because there seems to be so many  
24 questions here. And yet we are here as a full  
25 Committee.

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1                   MEMBER DENNING: That is why we have three  
2 whole hours.

3                   CHAIRMAN WALLIS: You know subcommittees  
4 sometimes have the option of saying you guys aren't  
5 ready. You shouldn't go to the full Committee. But  
6 they are here.

7                   MEMBER DENNING: The full Committee has  
8 that same option, doesn't it?

9                   MR. WOLFGANG: To continue, in 2004, staff  
10 held a public meeting in Atlanta to discuss the staff  
11 positions and solicit stakeholder feedback. We worked  
12 with NEI to finalize an acceptable industry guidance  
13 document for circuit analysis. And that was NEI 0001.

14                   Staff issued RIS 2005-30 to clarify  
15 regulatory requirements for a circuit analysis. And  
16 that RIS addressed the terms associated circuits, any  
17 and all, and emergency control stations.

18                   And this draft generic letter was issued  
19 for public comment in October 2005. We held a public  
20 meeting in March of this year. And the pertinent  
21 public comments were incorporated into the final draft  
22 of the generic letter. And we also received CRGR  
23 approval to issue the generic letter.

24                   The basis for the generic letter -- the  
25 bulleted review of NRC regulations, generic

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1 communications, correspondence related to this issue.  
2 And we have references identified in the generic  
3 letter. The results of the 2001 NEI EPRI cable fire  
4 test program, prior to the cable fire test, there was  
5 very little information available regarding circuit  
6 failure during a fire which made enforcement of the  
7 regulations in this area difficult. And also input  
8 from inspectors on issues that needed to be addressed.

9 The issue clarified in the generic letter  
10 is multiple spurious actuations. As Dan said earlier,  
11 some licensees claim that only a single spurious  
12 actuation had to be assumed in their circuit analysis.  
13 This was based on a misinterpretation of Generic  
14 Letter 86-10 in response to question 5.3.10.

15 And also some licensees claimed multiple  
16 spurious actuation occur with sufficient time in  
17 between them to take mitigating actions.

18 CHAIRMAN WALLIS: Now this  
19 misinterpretation has been going on for how long?  
20 D.L. 86 is 9/86?

21 MR. WOLFGANG: Yes.

22 CHAIRMAN WALLIS: Over 20 years they have  
23 been under some misapprehension about the regulations?

24 MR. WOLFGANG: That is my understanding.

25 MR. FRUMKIN: In this section of the

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1 generic letter, it refers to the 3(g)(iii) associated  
2 circuits I believe. So it took 3(g)(iii) alternate  
3 shutdown -- I'm sorry -- it took this 3(g)(iii)  
4 assumption and applied it to 3(g)(ii) areas. And that  
5 is what this misinterpretation is describing.

6 MEMBER APOSTOLAKIS: Let me understand it  
7 a little bit the second bullet here. Suppose there is  
8 sufficient time between actuations? Okay, so you have  
9 the first one. You really don't know what the second  
10 one is going to be, right? It could be anything.

11 MR. WOLFGANG: Second.

12 MEMBER APOSTOLAKIS: Oh, let's say there  
13 are two --

14 MR. WOLFGANG: Actuations?

15 MEMBER APOSTOLAKIS: -- spurious -- yes.

16 MR. WOLFGANG: Yes, based on these tests,  
17 they could occur --

18 MEMBER APOSTOLAKIS: No, I understand  
19 that, that it is a very short time.

20 MR. WOLFGANG: Right.

21 MEMBER APOSTOLAKIS: But let's assume for  
22 a moment that there is sufficient time, there is long  
23 time between them.

24 MEMBER DENNING: And there may be, George.  
25 There is a contention that --

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1 MEMBER APOSTOLAKIS: Okay.

2 MEMBER DENNING: Yes, right.

3 MEMBER APOSTOLAKIS: But you still don't  
4 know what the second one is going to be.

5 MEMBER DENNING: Is going to be, right.

6 MEMBER APOSTOLAKIS: So you can really  
7 take mitigations actions without know what the second  
8 will be?

9 MEMBER DENNING: Well, now wait a second.  
10 If you have mitigated the first one --

11 MEMBER APOSTOLAKIS: Yes.

12 MEMBER DENNING: -- then it is as if you  
13 now just have one.

14 MEMBER APOSTOLAKIS: Oh, so now you are  
15 going to get together and wait.

16 MR. WOLFGANG: And when the second one  
17 occurs and you have time to mitigate that one.

18 MEMBER APOSTOLAKIS: And this is doable?  
19 I mean has anybody looked into the details of this?  
20 It comes back to this issue of open endedness. You  
21 really don't know what is going to happen next. So I  
22 don't understand this particular -- I mean have they  
23 submitted details, you know, if you have sufficient  
24 time, you will protect the plant?

25 MEMBER DENNING: You know what I think

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1 would help us is we had some better feeling as to how  
2 do they really mitigate these actuations?

3 MEMBER APOSTOLAKIS: Yes, exactly,  
4 exactly.

5 MEMBER DENNING: What is a typical -- and  
6 I know there are constraints on manual --

7 MR. WOLFGANG: Yes, in 3(g)(ii), they  
8 can't use manual actions.

9 MR. KLEIN: Licensees have commonly used  
10 operator manual actions to mitigate that spurious  
11 actuation. They may send an operator out in a plant  
12 to close a valve or some such action like that. And  
13 then they wait for the next actuation and they say,  
14 okay, I've got plenty of time available to have taken  
15 that first action. And now they wait for the second  
16 action. And when that occurs, they send the operator  
17 out.

18 So I think that second bullet there is to  
19 just simply indicate to the Committee that that is the  
20 claim that some licensees have made. That is not  
21 necessarily a position that the staff agrees with.

22 MEMBER APOSTOLAKIS: No, I understand  
23 that.

24 MR. WOLFGANG: Yes.

25 MEMBER APOSTOLAKIS: But I'm trying to

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1 understand the position.

2 MEMBER DENNING: Now suppose you had --  
3 suppose it takes 30 minutes to have them get out there  
4 and close the valve, now obviously -- more than, you  
5 know, and then something else happens say before he  
6 closes that valve, then the real question is there a  
7 compounding effect?

8 MR. WOLFGANG: And I guess like --

9 MEMBER DENNING: As far as you don't have  
10 enough operators that you can send out to do all these  
11 --

12 MEMBER APOSTOLAKIS: The real question is  
13 is the length of time the critical variable here. And  
14 it doesn't seem to me to be.

15 MR. FRUMKIN: I mean we'll give you an  
16 example, for example if you have a -- you going to  
17 drain two valves in series that would drain the RWST  
18 and you also damage a number of other equipment. They  
19 fail. They short out and become unavailable.

20 Well, if you have -- if you lose the  
21 indication on the RWST and you open up the valve and  
22 you say you have plenty of time to -- you have  
23 indication the valve opened spuriously, you can go  
24 down and close the valve and then when the next valve  
25 opens, it has no effect.

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1 I think that would be an example of where  
2 they feel they would have sufficient time. Let's say  
3 the circuits are in cable trays -- you know, 20, you  
4 know, six cable trays above. There is going to be a  
5 good deal of time before the first cable tray is  
6 damaged and the next -- the first cable is damaged and  
7 then the next cable.

8 So -- and from a risk standpoint, you  
9 might be able to argue yes, we will have adequate  
10 indication that the valve opened and we have adequate  
11 time. And then that could be a risk-informed type  
12 analysis.

13 But if they are in the same cable, then  
14 they both could open simultaneously.

15 MEMBER MAYNARD: If there is time and  
16 there are a number of things they can do, when you  
17 have a fire in an area, you typically know what cables  
18 and what other things could be potentially effected in  
19 that and the manual actions going out either manually  
20 isolating valves, pulling breakers, a number of things  
21 you can do. But it is based on what is in that area  
22 or what could be effected with those in that area.

23 MEMBER APOSTOLAKIS: I remember when I was  
24 reading the analysis of the Browns Ferry fire a long  
25 time ago. They did have spurious actuations there did

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1 they not?

2 MR. WOLFGANG: Yes.

3 MEMBER APOSTOLAKIS: Within 20 minutes I  
4 believe they had all sorts of signals and so on. And  
5 then things started going dead. How does that  
6 experience fit into this?

7 MR. FRUMKIN: I think that experience is  
8 "the long-held staff position" that multiple  
9 simultaneous spurious actuations occur. I think when  
10 you want to point your finger to where we come up with  
11 that, it comes from 1975. It comes from the very  
12 beginning of fire protection regulation is that these  
13 spurious actuations occur.

14 And I think that -- unfortunately the  
15 statements of consideration for Appendix R are short.  
16 You know we have, you know, dozens of pages for a  
17 short NFPA-805 and there may be a dozen pages and a  
18 page maximum for 3(g)(iii) -- for 3(g) of Appendix R.  
19 So we really can't go back in time and pull out the  
20 basis for that. But we have Mark Sallies here, he  
21 might be able to shed some light on that.

22 But I believe that that is the long-held  
23 staff position is the Appendix R fire and these  
24 multiple spurious and rapid succession starting pumps  
25 giving incorrect indication, doing all sorts of

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1 unpleasant things to the plant.

2 CHAIRMAN WALLIS: The incorrect indication  
3 is a big problem. Something has happened and yet you  
4 don't know quite what has happened. That is another  
5 variable altogether from the time. I mean it is the  
6 uncertainty of knowing what is going on which might  
7 lead the operator to do the wrong thing.

8 MEMBER-AT-LARGE SIEBER: Yes, on the other  
9 hand, indications usually either go full scale or to  
10 zero.

11 MEMBER MAYNARD: A lot of times you've got  
12 multiple indications. And that is something they are  
13 trained on quite a bit is on instrument failures.  
14 That said, it is not uncommon to have an instrument  
15 failure without a fire. So they are trained on how to  
16 handle that.

17 MR. FRUMKIN: Right. One of the failure  
18 though they can also get -- and, again, there's  
19 multiple indications, but they could get an indication  
20 of a pump starting when it didn't start. Or a pump in  
21 a start and stop position and then that's going to  
22 take time for them to troubleshoot and whether it was  
23 started or stopped could it be adversely effecting  
24 overfilling the plant or not.

25 There are a number of timing issues that

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1 I'm sure they are trained on. But they can be  
2 potentially challenging.

3 MEMBER DENNING: Continue.

4 MR. WOLFGANG: The NRC letter from Sam  
5 Collins to NEI in 1997 stated that multiple spurious  
6 actuations caused by fire-induced hot shorts must be  
7 considered and evaluated. As I stated earlier, Byron  
8 and Braidwood have SCRs approving the assumption of a  
9 single spurious actuation for a fire event. So if the  
10 staff position is applied to them, it would be  
11 considered compliance backfit.

12 The generic letter --

13 MEMBER-AT-LARGE SIEBER: That's a unique  
14 case, those two plants.

15 MR. WOLFGANG: Yes, correct. The generic  
16 --

17 MEMBER APOSTOLAKIS: But what does that  
18 mean now?

19 MR. WOLFGANG: They are in compliance by  
20 definition.

21 MEMBER APOSTOLAKIS: You would say the SCR  
22 was not correct or what?

23 MR. WOLFGANG: They are in compliance by  
24 definition, right.

25 MEMBER APOSTOLAKIS: But I don't

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1 understand this compliance backfit.

2 CHAIRMAN WALLIS: Compliance by mistake is  
3 what I heard earlier.

4 MR. WOLFGANG: Well, by regulatory  
5 approval.

6 MEMBER APOSTOLAKIS: Can you explain the  
7 parenthesis? If stop position is applied to them, it  
8 would be a compliance backfit. You mean the current  
9 position?

10 MR. WOLFGANG: If they comply with their  
11 SER, the SER is approved even though it was a mistake,  
12 it would be a compliance backfit if we made them  
13 change.

14 MEMBER APOSTOLAKIS: So you would have to  
15 admit then that the SER was not correct?

16 MR. WOLFGANG: We have already admitted  
17 that.

18 MEMBER APOSTOLAKIS: Okay.

19 MEMBER MAYNARD: It is a matter of what  
20 regulatory process is used to actually do it. A lot  
21 fo people think backfit is a bad thing. I think it is  
22 a process that should be used a little bit more rather  
23 than trying to go around a lot of these things. Just  
24 say hey look, we've changed or this is a new  
25 requirement. Here's the regulatory burden. Here is

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1 the increased safety benefit. We are imposing this as  
2 the new requirement for you. It's not necessarily a  
3 bad thing. Just what regulatory burden --

4 MEMBER APOSTOLAKIS: But this doesn't  
5 happen too often, right? I mean --

6 MEMBER DENNING: What? Regulatory  
7 mistakes?

8 MEMBER APOSTOLAKIS: Yes.

9 MEMBER DENNING: Right.

10 CHAIRMAN WALLIS: Well, this last bullet,  
11 I have a lot of problem with. And they must be  
12 considered and evaluated. But it seemed to be very  
13 unclear about to what depth and by what methods these  
14 things must be considered and evaluated. That seems  
15 to be so open-ended that the licensee must be  
16 uncertain what he has to do.

17 MEMBER DENNING: RIS provides more detail  
18 than the generic letter does, right. The 2005 RIS.

19 MR. WOLFGANG: 2005-30?

20 MEMBER DENNING: Yes.

21 MR. WOLFGANG: Not on multiple spurious  
22 actuations, no.

23 MEMBER DENNING: No?

24 MR. WOLFGANG: It doesn't address that.

25 We didn't put that in there because we thought

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1 multiple spurious actuations because of this Byron and  
2 Braidwood SCR could be considered possibly a change in  
3 staff position. So that's why we didn't want to put  
4 it in a RIS.

5 CHAIRMAN WALLIS: There is no regulatory  
6 guide that says how to evaluate multiple spurious  
7 actuations?

8 MR. KLEIN: I think if I could respond to  
9 that question, I'll ask Dan also to pipe in. Is on  
10 page 7 of the generic letter where we do talk about,  
11 you know, ways that licensees can bring themselves  
12 into compliance, there is a discussion in there about  
13 the deterministic methodology or NEI-0001.

14 We do talk about the guidance in there in  
15 Chapter 3. We do say that for post-fire safe-shutdown  
16 circuits in conjunction with the guidance provided in  
17 this generic letter that NEI-0001 is one of the  
18 acceptable approaches to achieve regulatory compliance  
19 with the fire protection requirements for multiple  
20 spurious actuations.

21 So that's one example. And Dan can  
22 correct me if I've overstated this.

23 MR. WOLFGANG: And we say in conjunction  
24 with the guidance provided in this generic letter to  
25 mean consider multiple spurious actuation. I believe

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1 NEI-0001 says to consider two spurious actuations.

2 CHAIRMAN WALLIS: That doesn't mean  
3 anything to me. It could simply mean to say well I  
4 considered it and I think it is irrelevant or  
5 something. I mean what does consider mean? But what  
6 depth? By what methods?

7 MEMBER APOSTOLAKIS: To the depth required  
8 to convince the staff.

9 MEMBER BONACA: That is called open ended.  
10 We could fix it here but it seems to me that, you  
11 know, we do have a problem. And we are trying to  
12 figure out what is the best regulatory process to  
13 solve it. But the problem is there.

14 CHAIRMAN WALLIS: Well, I think we agree  
15 there is a problem. It is just whether or not there  
16 is a mature enough process in place to make something  
17 that is workable happen.

18 MEMBER BONACA: I understand.

19 MEMBER-AT-LARGE SIEBER: Well, this work  
20 has already been done once. The only thing that  
21 changed is the disqualification of certain fire  
22 barriers. All the licensees have done this. And it  
23 should be part of their licensing basis. There should  
24 be plant records as to how they did it the first time.

25 MEMBER DENNING: Really, Jack? I mean

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1 isn't there an issue here of the number of licensees  
2 who thought that they were really dealing with one  
3 spurious actuation requirement? Or one at a time?

4 MEMBER-AT-LARGE SIEBER: I can only speak  
5 to one licensee or about one licensee. And that was  
6 not the assumption.

7 MEMBER DENNING: That was not your  
8 assumption.

9 MEMBER-AT-LARGE SIEBER: No.

10 MEMBER DENNING: No. But there are  
11 licensees out there --

12 MEMBER-AT-LARGE SIEBER: Otto, was that  
13 yours? It is sort of obvious from Browns Ferry that  
14 you get more than one.

15 MEMBER MAYNARD: I'm trying to recall  
16 because the only place where we had different trains  
17 mixing was in the control room so it was primarily a  
18 control room-related issue.

19 MEMBER KRESS: But that is one purpose of  
20 the generic letter to find out the status.

21 MEMBER-AT-LARGE SIEBER: The only time the  
22 number of faults becomes an issue is when you are  
23 trying to solve the problem with operator manual  
24 actions. So now you've got too many things for too  
25 few people to do.

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1           But if you have train separation and the  
2 train separation is effective, you are going to get  
3 some spurious actuations which are going to be  
4 upsetting but not fatal. And you are still going to  
5 maintain a full set of safety equipment that  
6 functions. And that is the object of the fire  
7 protection regulation.

8           MR. KLEIN: I would strongly agree with  
9 what Dr. Sieber just indicated in that the focus here  
10 is on 3(g)(ii) compliance and that is where you've got  
11 the redundant trains in the same fire area as Dan had  
12 indicated. And Dan had indicated some of the history  
13 that, you know, led us up to this.

14           And that had to do with the resolution  
15 that some licensees used to address the thermal lag  
16 issue where they removed some of these fire barriers  
17 and in lieu of meeting the separation requirements of  
18 3(g)(ii), elected to put in place the use of operator  
19 manual actions.

20           And I think that is a very important thing  
21 to kind of keep in mind.

22           MEMBER-AT-LARGE SIEBER: But other  
23 licensees pulled no cable.

24           MR. KLEIN: That is correct. I'm not --

25           MEMBER-AT-LARGE SIEBER: They moved

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1 circuits out of the same fire area.

2 MR. KLEIN: Yes, I'm not suggesting that  
3 all licensees implemented unapproved operator manual  
4 actions in lieu of the requirements of 3(g)(ii).

5 There are other licensees who did plant modifications,  
6 did re-analysis, did re-wraps, pulled cables, what  
7 have you to bring themselves back into compliance with  
8 3(g)(ii).

9 MEMBER-AT-LARGE SIEBER: And some of them  
10 didn't use thermal lag to begin with.

11 MR. KLEIN: That is correct.

12 CHAIRMAN WALLIS: Well, I don't really  
13 have a good understanding of what kind of spurious  
14 actions we are talking about, what kind of operator  
15 actions in response we're talking about, and whether  
16 redundant trains solve the spurious action problem.

17 If I have a fire scenario and it switches  
18 on my high pressure injection, I've got a pump that  
19 runs and it is pouring water into the system, right?  
20 For one thing, I have to know -- I have to diagnose  
21 what is happening. Do I have to send somebody  
22 somewhere to shut a valve? And does that factor have  
23 some redundant train help me at all when something has  
24 been activated spuriously? I mean it is not clear to  
25 me what the range of kind of scenarios is that you are

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1 talking about here.

2 And whether redundant trains always help  
3 you or don't. Maybe they don't help you at all  
4 sometimes. And maybe the operator action sometimes is  
5 so severe that it is very difficult to take.

6 MEMBER MAYNARD: I think in most cases,  
7 there are things they can do. But there are some --  
8 and I think the power operator relief valve is one  
9 that if you have a system where you can't operate the  
10 block valve or the PRE, if it opens you basically have  
11 given yourself a small break.

12 CHAIRMAN WALLIS: That's what I think.  
13 When you think about TMR, they had a false indication  
14 because there was a light which said it was closed  
15 when it was open.

16 MEMBER MAYNARD: But most times you are  
17 still covered by -- I mean you are still analyzed for  
18 a small break LOCA or for the other events. A pump  
19 coming on, there are multiple ways to turn pumps off.  
20 And you are not going to be injecting water at such a  
21 rate that you have, you know -- I'm kind of talking  
22 more PWR than I am BWN here so I --

23 MEMBER DENNING: But it is those things  
24 though -- it is the multiplicity of those things that  
25 boggles my mind. You know rather than train

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1 separation and train protection which you talked  
2 about, it just seems like there is such a multiplicity  
3 of potential things and trying to analyze all those  
4 things seems almost open ended.

5 MEMBER-AT-LARGE SIEBER: There aren't --  
6 in sheer numbers, there aren't all that many safety  
7 circuits. And if you go underneath the control room  
8 into the faucet rafter, you'll find loads of jumpers  
9 and knife switches and things like that where you can  
10 de-energize control circuits.

11 Now one of the problems is that it  
12 actually, in a lot of circuit breakers, it takes power  
13 to trip it, you know. The trip coil requires  
14 energization so pulling a knife switch doesn't  
15 guarantee that it will run forever. And so the  
16 operator really has to understand how the control  
17 system is set up to be able to do that.

18 But there are ways to overcome these  
19 problems that don't require excursions all over the  
20 plant. And on the other hand, the plant is designed  
21 to be safe provided that you have a functional safety  
22 train. Separation criteria, if rigidly applied,  
23 provides that independent safety train.

24 MEMBER DENNING: We are going to now take  
25 our break until 20 after 10. And then we will have to

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1 move surprisingly quickly after that.

2 CHAIRMAN WALLIS: Okay. So we're going to  
3 take a break until 20 past 10.

4 (Whereupon, the foregoing matter went off  
5 the record at 10:09 a.m. and went back on the record  
6 at 10:23 a.m.)

7 CHAIRMAN WALLIS: Rich, would you resume  
8 the management of the meeting, please?

9 MEMBER DENNING: Please proceed.

10 MR. WOLFGANG: Okay. The last issue,  
11 clarifying the generic letter, the point we have here  
12 is the staff position on multiple spurious actuations  
13 presented in the generic letter is consistent with  
14 section 9.5.1 of the standard review plan.

15 Public comments. The significant public  
16 comment was that the generic letter constituted a  
17 backfit to licensees. And we addressed this comment.  
18 We obtained CRGR approval to issue this generic  
19 letter. And, as I said earlier, only for Byron and  
20 Braidwood, who have approved SERs that we know of,  
21 would this constitute a backfit.

22 Basically, this generic letter is just a  
23 request for information.

24 MEMBER MAYNARD: I would challenge that.

25 MR. WOLFGANG: Yes. I think --

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1                   MEMBER MAYNARD: That's all right. We'll  
2 comment on that.

3                   CHAIRMAN WALLIS: It isn't just a request  
4 for information. It asks them to do a lot of things.

5                   MEMBER MAYNARD: Yes. That is what I  
6 challenge, that statement. Yes. We've talked about  
7 it.

8                   CHAIRMAN WALLIS: That was what I was  
9 uncertain about.

10                  MEMBER DENNING: Why don't you go ahead  
11 and summarize, even though we're going to have a  
12 couple of other things? Why don't you go ahead and  
13 summarize? Then there are a couple of other things we  
14 would like you to -- we have more than started. We're  
15 almost done.

16                  MR. WOLFGANG: A summary. The generic  
17 letter, as I said before, is a request for information  
18 from licensees. The industry cable fire test program  
19 reaffirmed the staff interpretation of the regulatory  
20 requirements concerning multiple spurious actuations  
21 must be considered in the circuits analysis. The  
22 generic letter is necessary to ensure that all  
23 risk-significant circuit situations are identified and  
24 addressed.

25                  CHAIRMAN WALLIS: Could you go back a bit

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1 and say something about why this came about? I mean,  
2 wasn't this something to do with this thermal lag  
3 business? All of these installations, like Hemmicks  
4 and Eastern, every time we look at them --

5 MR. WOLFGANG: Yes.

6 CHAIRMAN WALLIS: Well, isn't that the  
7 solution would be to have a proper barrier around  
8 these things?

9 MR. WOLFGANG: That's one solution, yes.

10 MEMBER DENNING: I don't see that as a  
11 total solution. I don't --

12 MR. WOLFGANG: That is one solution.  
13 Another solution is a separation, 20-foot separation.

14 CHAIRMAN WALLIS: But in the past, when we  
15 believed that this thermal lag worked, there wasn't a  
16 problem. Is that right?

17 MEMBER MAYNARD: No. I think the problem  
18 was still there then. This has been bounced around  
19 since I know at least the early '80s as an issue. I  
20 think the thermal lag, it helped in some cases where  
21 you could show separation in the trains, but it  
22 doesn't necessarily take care of you if you've got  
23 cables in the same area that are --

24 MEMBER DENNING: Right. They can still  
25 give you spurious actuation, regardless.

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1 MEMBER MAYNARD: Right.

2 MEMBER DENNING: Now, it may be -- do you  
3 have any comments on that?

4 MR. FRUMKIN: Yes. If you have the  
5 separation, you can still get spurious actuations.  
6 And that's a box that we're not in with the rule. The  
7 rule does not require that those be protected. So all  
8 plants have the flexibility for the unprotected train  
9 to mitigate through feasible and reliable manual  
10 actions those types of spurious actuations.

11 Now, if you were to get a spurious  
12 actuation that were to give you all incorrect  
13 indication and was not recoverable, then that would  
14 still have to be resolved because it would be a  
15 potential safety issue. But for the minor ones that  
16 we have been talking about that would be fairly easy  
17 to resolve through a manual operator action or there  
18 are procedural controls or something of that nature,  
19 that would not be a compliance issue per se.

20 MEMBER DENNING: Help me with that because  
21 I still don't quite understand it. So if you have a  
22 protected train and you get a spurious actuation from  
23 an unprotected train, then you have to analyze all  
24 combinations of spurious actuations still, don't you,  
25 that are possible in that unprotected train?

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1 MR. FRUMKIN: Alex, do you want to?

2 MR. KLEIN: Yes, I believe you do because  
3 the over-arching requirement of appendix R is to be  
4 able to safely bring your plant to safe shutdown. And  
5 if you don't know what's occurring in your plant, then  
6 you can't meet that over-arching high-level goal of  
7 achieving and maintaining safe shutdown of your plant.

8 MR. FRUMKIN: And I will just say that  
9 once you have your protective train, your protected  
10 train, your unprotected train has a very limited set  
11 of things that could hurt you.

12 Now, we're talking we have plenty of  
13 water. We have plenty of indication. We have plenty  
14 of everything. But now we might open, we might cause  
15 a drain letdown path to open or we might cause a pump  
16 to start, but we should be getting clear indication of  
17 that in the control room. And in the normal  
18 procedure, process, you'll be getting indication of  
19 these things happening. And they should be able to  
20 mitigate them fairly effectively.

21 Now, there may be some things that would  
22 be difficult to mitigate. And, as Alex says, they  
23 have to find those and find a way to mitigate them.

24 MEMBER DENNING: So you have lots of  
25 things you have to analyze, but the mitigation of it

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1 is probably not too severe for the plant, and the  
2 plant is allowed to do manual action on it.

3 Now, there is another set here. So what  
4 is the other set? Aren't you always required to have  
5 a protected train?

6 MR. FRUMKIN: Yes. And these plants don't  
7 have that protected train. In effect, all circuit and  
8 manual action findings or potential violations are  
9 lack of protection, lack of circuit protection.

10 MEMBER DENNING: Circuit separation.

11 MR. FRUMKIN: So when --

12 MEMBER DENNING: Separation of the --

13 MR. FRUMKIN: Right. So when a finding  
14 comes in, let's say we have that hypothetical finding,  
15 which opens up and drains down the RWST. The citation  
16 is going to be against 3G2, lack of separation and  
17 lack of protection.

18 Now, we don't require one protection  
19 method over another, but they didn't put a protection  
20 method in there to protect the -- well, RWST is a bad  
21 example because it is not a necessarily one-train  
22 system.

23 But let's say you have both trains being  
24 affected by a fire. And here this is probably what is  
25 the more likely scenario. One train is just going to

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1 be damaged by the fire and not work, and then the  
2 other train is going to have the spurious actuation.

3 We don't necessarily need both trains to  
4 have spurious actuations. So that's the situation.  
5 It doesn't have to be multiple spurious on multiple  
6 trains.

7 MEMBER APOSTOLAKIS: Have we agreed that  
8 the first bullet is not quite correct? We're asking  
9 for more than just information?

10 MR. FRUMKIN: It's clear.

11 MEMBER APOSTOLAKIS: Yes.

12 MEMBER DENNING: It just takes them a lot  
13 of work to do it. I think we all recognize that it's  
14 a request for information, but in order to produce  
15 that information, you have to do a lot of work.

16 MEMBER APOSTOLAKIS: Right. It sounds to  
17 me like the priest saying, you know, "I know you're a  
18 sinner, George. Now, you go away and think of all the  
19 ways in which you could be a sinner and come back and  
20 tell me what they are." I have thought about it.

21 CHAIRMAN WALLIS: It's already been  
22 analyzed.

23 MEMBER APOSTOLAKIS: I protected myself.

24 MEMBER DENNING: Let's go on. And I would  
25 like to hear the conservative risk analysis. And so

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1 would you give us a little presentation on the  
2 conservative risk analysis?

3 MR. FRUMKIN: Are you done with all of  
4 your slides?

5 MEMBER DENNING: Yes.

6 MR. WOLFGANG: Yes. I just want to say  
7 one thing. If we don't issue a generic letter, we'll  
8 have to use the inspection process behind these  
9 problems.

10 It will take longer. We estimate three  
11 triennials, nine years. And some risk-significant  
12 items may be missed. We don't know because the burden  
13 is put on us, instead of the licensee. I just want to  
14 bring it up.

15 MEMBER DENNING: Thank you.

16 MEMBER BONACA: Is it with regard to the  
17 90 days with the responses? I mean, how did you come  
18 up with the 90 days, recognizing that you have to go  
19 to award to provide these responses? Was there an  
20 evaluation that you performed?

21 MR. WOLFGANG: No.

22 MEMBER BONACA: I mean, can it be changed?

23 MR. WOLFGANG: It can be changed. It was  
24 an arbitrary period that we thought was --

25 MEMBER APOSTOLAKIS: Or you can reduce the

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1 requirement.

2 MR. WOLFGANG: Yes, or we can --

3 MEMBER APOSTOLAKIS: So we don't have  
4 these?

5 MR. FRUMKIN: No, you don't have these  
6 slides. We will be making them available.

7 MR. KLEIN: Just as a reminder, if I can  
8 just follow up on the 90-day issue and the comments in  
9 regard to that, we do have a bullet in there that, for  
10 licensees who can't meet that 90-day requirement, that  
11 within the 30 days, they come in and request an  
12 extension.

13 MEMBER MAYNARD: Yes. And I saw that in  
14 the generic letter. If it's a situation where you  
15 know 90 percent of the industry is not going to be  
16 able to do it, you might as well be able to pick a  
17 date where everybody is not having to do it. I'll be  
18 interested in hearing from the industry as to whether  
19 they think that is a burden or not. I think I am  
20 assuming it is, but it may not be. So I don't know.

21 MR. FRUMKIN: This is a bounding risk  
22 analysis for multiple spurious actuations. It was  
23 developed for this meeting by Ray Gallucci, Dr. Ray  
24 Gallucci, who is in the Fire Protection Section. And  
25 it's been presented as a paper for the American

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1 Nuclear Society presentation. I think this winter  
2 they're having a meeting.

3 I am the third string presenter of this  
4 document. Ray is the first string. Dr. Weerakkody is  
5 the second string. And I'm presenting out of  
6 necessity.

7 MEMBER DENNING: Is Ray here to get beaten  
8 upon if he --

9 MR. FRUMKIN: No. Ray is on inspection at  
10 Browns Ferry. So we have --

11 MEMBER APOSTOLAKIS: Last time he was here  
12 he --

13 MEMBER DENNING: No wonder he's at Browns  
14 Ferry.

15 MR. KLEIN: Let me clarify. He's on a  
16 program review at Browns Ferry. He's not on an  
17 inspection.

18 MR. FRUMKIN: Okay. I'm sorry. These  
19 slides will be made available. My understanding of  
20 this analysis is using an older plant PRA that Ray was  
21 involved in, he pulled out some of the important  
22 measures for some hot shorts. And he recombined them  
23 into multiple hot shots and, using a simplification  
24 process, determined a bounding risk analysis for those  
25 based on those important measures for one plant's PSA.

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1           So this is the typical older nuclear power  
2 plant, has a fire CDF of  $3.3^{-5}$ . And they used a hot  
3 short probability of .1. They had modeled 24 of the  
4 basic events. And that contributed about 5 percent to  
5 the fire CDF or  $1.8D^{-6}$ .

6           And then there were some systematically  
7 symmetric redundant train components that were chosen  
8 because I think they had more of a larger impact on  
9 the plant risk if they were to fail together. And  
10 that was a contribution of .03 to the fire CDF, those  
11 10 items.

12           MEMBER DENNING: Let's go slowly so we --

13           MEMBER APOSTOLAKIS: Yes.

14           MEMBER DENNING: -- understand what we  
15 have here.

16           MR. FRUMKIN: Okay.

17           MEMBER APOSTOLAKIS: Twenty-four hot short  
18 basic events above truncation. What does that mean?

19           MR. FRUMKIN: That in the model, the ones  
20 that had remained as important remained having  
21 importance measures in the model, that there were only  
22 24 hot shorts that remained there.

23           MEMBER APOSTOLAKIS: The core damage  
24 frequency due to hot shorts is  $1.8 \cdot 10^{-6}$  per year, it  
25 says.

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1 MR. FRUMKIN: Correct, assuming a hot  
2 short probability of .1.

3 MEMBER APOSTOLAKIS: Which was low.

4 MR. FRUMKIN: Which is low based on  
5 current data.

6 MEMBER KRESS: Okay. So one, it would be  
7 1.8 times  $10^{-5}$ .

8 MR. FRUMKIN: If you said 1.0, correct.

9 MEMBER DENNING: Now, you said that that's  
10 low, but don't forget here that now we're talking  
11 supposedly real nuclear power plants with fires where  
12 you would take into account the fact that the fire may  
13 not damage any cables, you know.

14 MR. FRUMKIN: Right. Well, this is from  
15 an --

16 MEMBER DENNING: Oh, this is --

17 MR. FRUMKIN: -- old fire PSA. So this  
18 does consider --

19 MEMBER DENNING: Yes, it does.

20 MR. FRUMKIN: -- many of those factors.

21 MEMBER DENNING: But saying that the  
22 probability of your hot short is .1 and saying, "Well,  
23 that is low," I think because we saw those other  
24 things where people say, "Well, it could be .6 or .2  
25 or something like that," --

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1 MR. FRUMKIN: Right.

2 MEMBER DENNING: -- and, therefore, this  
3 is low, that doesn't necessarily follow.

4 MR. FRUMKIN: I think this is the  
5 conditional hot short probability based on cable  
6 damage.

7 CHAIRMAN WALLIS: How about multiple  
8 shorts come into this?

9 MR. FRUMKIN: That is what we are going to  
10 be talking about.

11 CHAIRMAN WALLIS: This doesn't address  
12 that?

13 MR. FRUMKIN: No, no. Right. This is  
14 what this analysis is. So assuming that the  
15 components within each pair -- these are those ten  
16 items that have been paired -- have similar failure  
17 characteristics and locations, including their cable  
18 runs, again, this is a conservative assumption and  
19 that these comprise the full set of candidates for  
20 multiple spurious actuations that are not specifically  
21 modeled in the traditional IPEEEs as --

22 MEMBER APOSTOLAKIS: The number you showed  
23 us earlier assumes that these happen independently?

24 MR. FRUMKIN: Yes.

25 MEMBER DENNING: You know, I still don't

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1 understand the pairing. What is going on here? Is it  
2 ten corresponding to --

3 MEMBER APOSTOLAKIS: Ten of these?

4 MEMBER DENNING: Five paired components.

5 That means that there is a --

6 MEMBER APOSTOLAKIS: Redundant elements.

7 MEMBER DENNING: They're redundant  
8 elements.

9 MEMBER APOSTOLAKIS: Yes.

10 MR. FRUMKIN: I believe what they did is  
11 of these 24, they took out 10 of them that could when  
12 combined have an issue.

13 MEMBER APOSTOLAKIS: They are still  
14 located in the --

15 MEMBER DENNING: It could lead to  
16 problems.

17 MR. FRUMKIN: On this slide, they're  
18 independent.

19 MEMBER APOSTOLAKIS: Yes.

20 MR. FRUMKIN: But I think what we're going  
21 to do is we're going to try to take out that and look  
22 at them as pairs. So this is what we're going to do,  
23 form a bounding analysis to estimate the potential  
24 maximum CDF due to multiple spurious actuations for  
25 this typical older MPP, which I think is what the

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1 target, the goal is here.

2 And now we start getting into some  
3 formulas. Per pair, one hot short corresponds to  
4 train A and the other to train B. So that's how they  
5 were paired. And they appear in symmetrically paired  
6 cut sets.

7 So one cut set, the CDF of A -- and  
8 there's the formula for that -- and the CDF of B,  
9 which is the fire initiator, and then the hot short or  
10 random failure of one of the paired components and  
11 then the summation of the B. Okay?

12 CHAIRMAN WALLIS: And where do the  
13 multiple shorts come in?

14 MR. FRUMKIN: This is the formula for --

15 CHAIRMAN WALLIS: It's between two trains,  
16 but it's not multiple shorts in the same cable.

17 MR. FRUMKIN: That's correct, not in the  
18 same cable.

19 CHAIRMAN WALLIS: It's still independent.  
20 And this formula that you have here, the cut sets, are  
21 still assuming that the --

22 MR. FRUMKIN: I think so. They're not  
23 going to be independent of the same fire and the same  
24 damage time, but they're going to be independent  
25 failures affected by the same fire.

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1 MEMBER APOSTOLAKIS: Conditional on the  
2 fire.

3 MR. FRUMKIN: Conditional on the fire.

4 MEMBER SIEBER: Which assumes the fire  
5 covers both things.

6 MR. FRUMKIN: Right, which is a  
7 conservative assumption in this analysis.

8 MEMBER SIEBER: Truly conservative.

9 MR. FRUMKIN: Yes.

10 MEMBER SIEBER: Improbable.

11 MR. FRUMKIN: Well, it depends on the  
12 design of the plant, but yes, it's --

13 MEMBER APOSTOLAKIS: So if I want to  
14 couple them, then, I will assume that Fa and Fb are  
15 just F, one fire. Is that correct? And then I will  
16 have --

17 MEMBER DENNING: A is --

18 MEMBER APOSTOLAKIS: Otherwise they are  
19 still independent. I mean, the fire initiator must be  
20 the same.

21 MR. FRUMKIN: Well, let's just hope that  
22 your answer --

23 MEMBER APOSTOLAKIS: We assume two  
24 different fires.

25 MEMBER DENNING: We'll go to the next

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1 slide. And maybe it will become clear.

2 MEMBER SIEBER: It's a lot clearer in  
3 here.

4 MR. FRUMKIN: Okay. So, again, we have --

5 MEMBER APOSTOLAKIS: This .1 comes from?

6 MR. FRUMKIN: The .1 was the  
7 state-of-the-art when they did this PSA of --

8 MEMBER APOSTOLAKIS: I'll tell you where  
9 it comes from.

10 MR. FRUMKIN: Okay.

11 MEMBER APOSTOLAKIS: That's 20 years or so  
12 ago.

13 MEMBER DENNING: You're responsible for  
14 .1?

15 MEMBER APOSTOLAKIS: I saw it, and I said,  
16 "Well, gee. How did you come up with that?"

17 So they said, "Well, call this guy"  
18 somewhere in California.

19 I called this guy. He says, "Well, you  
20 know Sandia told us that."

21 "What Sandia?"

22 "This person."

23 So I called this person in Sandia. He  
24 says, "Well, I really don't know. It's this other  
25 guy."

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1           So I called this other guy. And he says,  
2 "You told us that."

3           (Laughter.)

4           MEMBER DENNING: So we're going to accept  
5 the .1.

6           MEMBER APOSTOLAKIS: It wasn't followed up  
7 at all. I mean, that was the funniest thing.

8           MR. FRUMKIN: The IPEEE assumed this hot  
9 short probability of .1. And then I believe we're  
10 doing a simplification of these factors here. And it  
11 actually gets very simple on the next slide, but if  
12 anyone really wants me to read through this, I can  
13 try.

14           MEMBER DENNING: You know what we'll do?  
15 Let's go to the bottom line.

16           MR. FRUMKIN: The bottom line.

17           MEMBER DENNING: And we'll have copies of  
18 this.

19           MR. FRUMKIN: Okay. Yes.

20           MEMBER DENNING: And we'll --

21           MR. FRUMKIN: Okay. This is, I believe --  
22 well, let's see.

23           MEMBER APOSTOLAKIS: No. This is --

24           MR. FRUMKIN: This is the bottom line  
25 here.

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1 MEMBER APOSTOLAKIS: Go back a little bit.

2 MR. FRUMKIN: I think --

3 MEMBER APOSTOLAKIS: This Fa plus Fb I  
4 don't understand. I thought it was going to be 1.5.

5 CHAIRMAN WALLIS: That's two fires, isn't  
6 it?

7 MEMBER APOSTOLAKIS: This is one or the  
8 other, yes, one or the other.

9 MR. FRUMKIN: Yes.

10 MEMBER APOSTOLAKIS: It doesn't really --  
11 I mean, he should have assumed one fire as far as I  
12 can tell. But, again, the --

13 MEMBER DENNING: We will look at it  
14 carefully.

15 MEMBER APOSTOLAKIS: -- connection is  
16 nothing, I mean, right?

17 MEMBER DENNING: We will look at it  
18 carefully later.

19 MR. FRUMKIN: Right. That would be a  
20 small difference.

21 MEMBER DENNING: And Ray's bottom line  
22 again is?

23 MR. FRUMKIN: Okay. Well, what he does  
24 here is he's taking out the  $1.1E^{-6}$ . And he's putting  
25 in this value or coming up with this value of .011,

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1 which is his surrogate simplification for all of the  
2 fires and his X factor, which is his fire and his  
3 failure factor.

4 MEMBER APOSTOLAKIS: He's bounding the  
5 random failures, right, by assuming a  $10^{-3}$ , right?

6 MR. FRUMKIN: I believe so.

7 MEMBER APOSTOLAKIS: Yes.

8 MR. FRUMKIN: Typical, right.

9 MEMBER APOSTOLAKIS: But he doesn't know  
10 how many -- oh, this is a bound on all random failures  
11 that are required.

12 MR. FRUMKIN: Yes.

13 MEMBER DENNING: Continue. Let's see.

14 MR. FRUMKIN: Okay. And now he's talking  
15 about the dual failures. Any of the ten paired hot  
16 shorts would appear in the cut sets. And Fa is the S,  
17 which is your severity factor, which going to reduce  
18 your likelihood of more hot shorts, which is the  
19 likelihood of having a big fire that's going to cause  
20 this damage.

21 CHAIRMAN WALLIS: Which affects both  
22 trains?

23 MR. FRUMKIN: Right. And then your  
24 various factors, A hot, B hot short, and then your  
25 random factors.

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1 MEMBER APOSTOLAKIS: Why square? Why A  
2 hot times A hot? It still assumes that they're  
3 independent events, right?

4 CHAIRMAN WALLIS: Well, that is the A hot  
5 times B hot --

6 MEMBER DENNING: It is going to take us  
7 some time to really work through this. Rather than do  
8 this here, --

9 MR. FRUMKIN: Okay.

10 MEMBER DENNING: -- let's go see Ray's  
11 bottom line.

12 MR. FRUMKIN: Okay. The bottom line is  
13 here.

14 MEMBER APOSTOLAKIS: All right.

15 MR. FRUMKIN: So for his choice of fires,  
16 for severity factor, I think he used a .1 for this  
17 extreme fire, which is an S.

18 CHAIRMAN WALLIS: Why is .1 extreme? It  
19 could be .5.

20 MR. FRUMKIN: Oh, no, no, no. This is for  
21 the likelihood of a large fire.

22 CHAIRMAN WALLIS: Yes. But just asking  
23 George Apostolakis by telephone tag --

24 MR. FRUMKIN: Oh, no. This is not his .1.

25 CHAIRMAN WALLIS: I thought it was his .1.

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1 MR. FRUMKIN: It's somebody else's .1.

2 MEMBER APOSTOLAKIS: This is from one of  
3 my students.

4 MR. FRUMKIN: That's right. Right. This  
5 .1 is from very likely the fire protection STP, which  
6 says that severe fires happen or ten percent of all  
7 fires that happen are severe, which is, again, a  
8 conservative number based on the state-of-the-art,  
9 which is the 6850 analysis.

10 But that's what we're doing with -- I  
11 mean, this is no question about it. This is a  
12 bounding analysis.

13 CHAIRMAN WALLIS: The ones that cause hot  
14 shorts?

15 MR. FRUMKIN: No. Instead of using a  
16 severity factor of one, assuming that all fires will  
17 cause the damage, we're only assuming that ten percent  
18 of the fires will cause the damage to cause hot short.  
19 So there are many different ways of severity --

20 MEMBER APOSTOLAKIS: So this .011, .011,  
21 is the frequency of fire or, no, this is from the  
22 random failure?

23 MR. FRUMKIN: Right.

24 MEMBER APOSTOLAKIS: According to one is  
25 one?

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1 MR. FRUMKIN: That's the severity factor.

2 MEMBER APOSTOLAKIS: What is the frequency  
3 of fire?

4 MR. FRUMKIN: What I believe he has done  
5 is I believe he has back-calculated through his  
6 simplification that .1 that he used. And he's turned  
7 that, the whole -- all of his important measures into  
8 this .011.

9 MEMBER APOSTOLAKIS: So that includes the  
10 frequency of fire?

11 MR. FRUMKIN: I believe so.

12 MEMBER APOSTOLAKIS: That's a pretty high  
13 number.

14 MR. FRUMKIN: Yes.

15 MEMBER DENNING: We are going to look at  
16 this carefully, but his bottom line is saying, well,  
17 what this could do in this particular case is it could  
18 have increased by a factor of three the fire damage  
19 frequency.

20 MR. FRUMKIN: I think what he's trying to  
21 say here is that when he back-calculates from his  
22 importance measures and then he combines these pairs,  
23 that -- and this is the bottom line here -- he can  
24 have a maximum of  $10^{-4}$  per year due to these pairs of  
25 hot shorts.

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1 MEMBER DENNING: And without it, they had  
2 3 times  $10^{-5}$  is what this plant did.

3 MR. FRUMKIN: Yes. That's the whole fire  
4 risk for the plant, is 3 times  $10^{-5}$ . So this could be  
5 dominating.

6 MEMBER APOSTOLAKIS: But why couldn't you  
7 go to an actual PRA and fix, instead of whatever they  
8 had, and see what happens, rather than doing this  
9 undue analysis? I mean, there are detailed fire PRAs  
10 out there.

11 MR. FRUMKIN: We don't actually have one  
12 in the office. He did have this information available  
13 to him.

14 MEMBER DENNING: What I would like to do  
15 is we would definitely like copies. Don't go  
16 anywhere.

17 MR. FRUMKIN: Okay.

18 MEMBER DENNING: And I don't think you  
19 have to read that. What we would like -- I mean, you  
20 can actually --

21 MR. FRUMKIN: Well, here his last slide is  
22 at least for a typical older nuclear power plant, one  
23 cannot a priori dismiss multiple hot shorts of being  
24 of lower significance.

25 MEMBER DENNING: Okay.

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1 MEMBER APOSTOLAKIS: Well, I would like to  
2 see the paper, please. No, no. Give me a copy.

3 MEMBER DENNING: Right. Yes, if we may.  
4 What we would like to do now is we would like to hear  
5 now from NEI, if we could. Don't run away, Research.

6 MEMBER APOSTOLAKIS: Don't anybody go  
7 away.

8 MEMBER DENNING: Don't anybody leave town  
9 other than me, but I would definitely like to make  
10 sure we have plenty of time to hear from NEI.

11 MEMBER APOSTOLAKIS: That's what I call  
12 running and meeting with --

13 MEMBER DENNING: The policeman is asked to  
14 lock the doors.

15 MEMBER APOSTOLAKIS: We have a cop  
16 outside?

17 MEMBER DENNING: And, Alex, you don't have  
18 handouts, but we can make them. Is that a true  
19 statement?

20 MR. MARRION: No, I do not have handouts.  
21 I do have a couple of comments.

22 MEMBER DENNING: You have comments?

23 MR. MARRION: Yes.

24 MEMBER DENNING: But you don't have any  
25 papers?

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1 MR. MARRION: No.

2 MEMBER DENNING: Okay. Please proceed.

3 MR. MARRION: Good morning. My name is  
4 Alex Marrion. I am a Senior Director of Engineering  
5 at NEI, and I appreciate the opportunity to offer a  
6 couple of comments on our perspectives on what we  
7 heard this morning.

8 Before I begin, I want to point out that  
9 we have two utility representatives, one from Progress  
10 Energy and one from Duke Power, who represent the two  
11 pilot plants for the application of NFPA 805.

12 And if the Committee so desires, I think  
13 it may be useful for you to understand the  
14 implications of this generic letter on the NFPA 805  
15 risk-informed application process. And I'll defer to  
16 you to --

17 MEMBER DENNING: We so desire.

18 MR. MARRION: Okay. Very good. Now I'll  
19 ask them to step up when I finish my comments.

20 To get back to Dr. Apostolakis' --  
21 George's comment, --

22 (Laughter.)

23 MR. MARRION: -- the test protocol and the  
24 issue of having cables exposed in the flaming region,  
25 I don't have any direct knowledge of that discussion

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1 with the NRC staff at the time we developed the test  
2 protocol. This was the first I heard of it, but I'll  
3 look into it. And we'll try to get an answer to you  
4 at the end of the week.

5 I do want to make it clear that we believe  
6 the multiple spurious actuation is a new regulatory  
7 position that results in significant impact on utility  
8 licensees, not only on the Appendix R, the NUREG 0800  
9 plants but also on the NFPA 805 plants.

10 The impact is significant in that it  
11 changes the methodologies that the utilities have  
12 credited in their licensing basis over the last 20  
13 years. So the licensing basis has to change.

14 Now, with that, it's perfectly appropriate  
15 for the NRC to say, "There's new information that has  
16 been brought to bear on this topic. And we have a new  
17 position." That's fine. But the NRC must bear the  
18 burden of demonstrating the safety impact of that new  
19 position and do a regulatory analysis to substantiate  
20 it because of the significant implications on the  
21 utility licensee design basis.

22 That's straightforward, but one thing that  
23 this position does not take into account is the  
24 fundamental elements of defense-in-depth relative to  
25 fire protection. What I'm talking about is the

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1 actions that are taken by licensees in preventing  
2 fires from occurring and detecting a fire when it does  
3 occur, having systems and personnel to respond to the  
4 fire to mitigate the consequences of the fire,  
5 suppression and detection systems, and then ultimately  
6 recovering the plant to assure that you can get into  
7 a safe condition.

8 We understand there is value to looking at  
9 risk-informed approaches and changes and assumptions  
10 and evaluating them accordingly, but I would recommend  
11 that we not lose sight of the defense-in-depth  
12 concepts as we go through this process going forward.

13 This generic letter is another example of  
14 what is fundamentally flawed with fire protection  
15 regulations and has been a problem with fire  
16 protection regulations and the associated regulatory  
17 process over the last 25 or 35 years.

18 And by that, I mean we have a continuous  
19 evolution of NRC positions and expectations that are  
20 addressed in a somewhat informal manner. And by that,  
21 I mean use of generic communications to articulate  
22 regulatory positions is, quite frankly, inappropriate.

23 New regulatory positions should be  
24 evaluated in terms of safety impact or clearly  
25 demonstrating the compliance issue associated with

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1 that new position. Then that has to be made publicly  
2 available so that the licensees can understand what  
3 these new positions are and what the basis for the  
4 positions are.

5 Historically in fire protection, it's been  
6 a plant-specific fire protection engineer from the  
7 licensee to an NRC inspector agreement of what the  
8 understanding is relative to an interpretation. And  
9 that is the problem that we're trying to fix. That's  
10 why we are so firm in our comments going forward,  
11 because fundamentally, gentlemen, if we don't address  
12 or we don't identify resolution to the spurious  
13 actuation issue today, it will be an issue for the  
14 NFPA 805 plants.

15 Going to 805 does not provide a resolution  
16 to this issue today because there is no understood  
17 methodology that can address the staff's position. I  
18 want to make that very clear.

19 MEMBER APOSTOLAKIS: Is this the  
20 open-ended issue that we discussed earlier?

21 MR. MARRION: Yes, yes. The comments made  
22 about CRGR approval of this generic letter, as an  
23 external stakeholder, that essentially is meaningless  
24 to us, reason being we are not privy to any kind of  
25 disciplined process that is used by CRGR or anyone

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1 within the NRC that clearly demonstrates this is the  
2 basis for the safety concern or this is the basis for  
3 the compliance concern.

4 What we have seen over the years -- and  
5 this is another example -- where the preferred route  
6 appears to be, well, let's make it a compliance  
7 concern because we as a regulatory agency, the NRC,  
8 can interpret the regulations. We have the right to  
9 interpret the regulations, et cetera, which is fine,  
10 but let's put the interpretation on paper. Let's  
11 identify resolution path so we have a common  
12 understanding going forward. We don't have that today  
13 on this particular issue.

14 Lastly, I would like to say that there  
15 isn't a generic letter that is simply a request for  
16 information. It should be clear from the discussion  
17 this morning that this generic letter basically  
18 imposes a new regulatory requirement that has  
19 significant impact on the licensing basis of current  
20 plants. That is not a request for information.

21 Those are the comments that I wanted to  
22 make this morning. I don't know if you have any  
23 questions on anything I said.

24 MEMBER DENNING: Yes, we do have some.  
25 One of them has to do with the timing, the 90 days,

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1 and the timing required to do the kind of analysis  
2 that's being requested there. Do you have a feeling  
3 as to what an appropriate time would be?

4 I mean, there's a timing that says, are  
5 you in compliance with this, which, regardless of this  
6 question, whether it's a new regulation or an old,  
7 there's no question the plant can determine that  
8 fairly quickly. But doing the entire analysis and  
9 determining what affected SSCs are, do you have any  
10 indication from the plants as to how much time that  
11 might take and what an appropriate time frame would be  
12 for a response like --

13 MR. MARRION: I don't have the information  
14 to answer the question, but I would submit that the  
15 next two individuals may be able --

16 MEMBER DENNING: May be of help on it?

17 MR. MARRION: -- to give you their  
18 perspectives.

19 MEMBER DENNING: Okay. Good.

20 MEMBER MAYNARD: Could I just --

21 MEMBER DENNING: Yes?

22 MEMBER MAYNARD: Your perspective comment  
23 was made that if the generic letter is not issued,  
24 then it would just have to be dealt with in inspection  
25 space. Do you have any comment on that?

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1 MR. MARRION: It is being dealt with in  
2 inspection space. Now, what we don't have is an  
3 external stakeholder. When I mention "we," I'm  
4 speaking of NEI and the industry. What is the safety  
5 case or what is the compliance case? And we haven't  
6 seen evidence of that clearly demonstrated that NRC  
7 action in this particular area is necessary in an  
8 expedited manner.

9 VICE CHAIRMAN SHACK: Just to address your  
10 methodology question, apparently you can deal with  
11 multiple actions if they come sequentially. So you  
12 have a methodology for that. And you're arguing that  
13 there isn't a methodology.

14 So it isn't necessarily the open-endedness  
15 of it that's the problem?

16 MR. MARRION: There isn't a methodology  
17 for addressing all spurious actuations in a given  
18 fire. Utilities had --

19 VICE CHAIRMAN SHACK: You can address them  
20 one at a time.

21 MR. MARRION: You can address them one at  
22 a time. And I would ask that the two utility  
23 representatives explain their methodology for circuit  
24 analysis. I think we would find that very insightful.

25 MEMBER DENNING: Good.

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1 MR. MARRION: But it's changed. And then  
2 what I would like to do is ask Dave Miskiewicz from  
3 Progress Energy and Harry Barrett from Duke Power.

4 CHAIRMAN WALLIS: I would bring up the  
5 point before you leave --

6 MR. MARRION: Yes?

7 CHAIRMAN WALLIS: You talked about the  
8 role of a generic letter and whether it just requests  
9 information. We have another generic letter on sumps,  
10 which you may be aware of, right?

11 MR. MARRION: I am generally aware of that  
12 one.

13 CHAIRMAN WALLIS: It not only requested  
14 information. It requested analysis, and it requested  
15 plans. And, in fact, it's resulted in large changes  
16 in the plant by a result of a generic letter.

17 MR. MARRION: Yes.

18 CHAIRMAN WALLIS: So it's not as if this  
19 is a unique generic letter, which is actually asking  
20 plants to do much more than just supply information.

21 MR. MARRION: My only point is a request  
22 for information as this generic letter is  
23 characterized as a mischaracterization of what its  
24 impact is.

25 CHAIRMAN WALLIS: Well, it clearly isn't

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1 that. I mean, it says a request for information and  
2 taking additional actions. I mean, the sentence asks  
3 for more than just information.

4 MR. MARRION: Okay?

5 MEMBER DENNING: Okay. Let's have our  
6 visitors come up.

7 MR. FRUMKIN: If I could add? This is Dan  
8 Frumkin. Just one point. The inspections started  
9 again in January of 2005, but there is still currently  
10 enforcement discretion for all circuit findings. And  
11 so there may be a perception that this has not turned  
12 into an issue yet because of a lack of enforcement in  
13 this area.

14 So starting in September 2006, enforcement  
15 will proceed for plants that do not have enforcement  
16 discretion under NFPA 805. So I just want to put that  
17 out there that currently there are no enforcement  
18 actions in this area for plants that take compensatory  
19 measures and have correction action plans.

20 MEMBER DENNING: Introduce yourselves,  
21 please.

22 MR. BARRETT: Good morning. My name is  
23 Harry Barrett. I work at Duke Power. I'm the  
24 three-site lead for NFPA 805 transition for all three  
25 of these sites in Duke Power's nuclear fleets. I just

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1 wanted to say a few words about the multiple spurious  
2 issue as it affects 805.

3           Although 805 is a risk-informed,  
4 performance-based rule, it is based on your current  
5 licensing basis going forward. And if that is  
6 questionable, then your regulatory foundation that  
7 you're billing it on would be questionable in 805,  
8 which ends up leading to a lot more effort and a lot  
9 more analysis required for that.

10           So this multiple spurious issue is adding  
11 a significant amount of paperwork and analysis to 805  
12 transition. The original concept was you would take  
13 your fire protection licensing basis, map it over to  
14 the 805 requirements, and it was pretty much just a  
15 paper transition.

16           With this new multiple spurious and the  
17 complications that that adds to the fire PRA, we're  
18 looking at a significant amount of engineering effort  
19 that goes into that.

20           It's going to take us over two years to do  
21 the transition for Oconee, which is the first plant.  
22 And a lot of that, most of that, is the PRA in the  
23 multiple spurious issue.

24           MEMBER APOSTOLAKIS: Do you agree that it  
25 is an issue?

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1 MR. BARRETT: I agree that it needs to be  
2 looked at. I have not seen a multiple spurious  
3 scenario that is risk-significant yet.

4 MEMBER APOSTOLAKIS: Do any of your plant  
5 have a detailed fire PRA?

6 MR. BARRETT: We have a fire PRA. We have  
7 --

8 MEMBER APOSTOLAKIS: Not IPEEE, though?

9 MR. BARRETT: We had an early '80s vintage  
10 fire PRA, but we are putting together a NUREG 6850,  
11 the new version of it.

12 MEMBER APOSTOLAKIS: Okay. So --

13 MR. BARRETT: We're doing that now.

14 MEMBER APOSTOLAKIS: It would be, then,  
15 possible for you to go back to that PRA and see what  
16 happens if you assume multiple --

17 MR. BARRETT: It assumed multiple in the  
18 original analysis. To use the core melt, we needed to  
19 use multiples for that particular analysis. So it  
20 included --

21 MEMBER APOSTOLAKIS: The number came out  
22 okay?

23 MR. BARRETT: It came out relatively high.  
24 I don't remember the exact number, but fire was a  
25 fairly significant contributor to risk in the --

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1 MEMBER APOSTOLAKIS: Not fire overall,  
2 but, I mean, this particular mode with --

3 MR. BARRETT: Spurious?

4 MEMBER APOSTOLAKIS: Yes.

5 MR. BARRETT: If I remember right, many of  
6 the combinations that we analyzed were within the  
7 bounds of the Appendix R analysis originally for  
8 control room evacuation. The main fire area that we  
9 got into trouble with the IPEEE or the fire PRA, the  
10 original one, was in our cable shaft going up to the  
11 control room, where we had just about every cable in  
12 the plant going through one area. And so --

13 MEMBER APOSTOLAKIS: It seems to me that  
14 --

15 CHAIRMAN WALLIS: Did you assume multiple  
16 spurious actuations, simultaneous, and all of this?

17 MR. BARRETT: In that particular PRA, we  
18 ended up having to go to multiple spurious actuations  
19 in order to get the core damage.

20 CHAIRMAN WALLIS: Okay. Including  
21 simultaneous actuations.

22 MEMBER APOSTOLAKIS: So it would be  
23 interesting, then, to compare your numbers and  
24 analysis with the bounding analysis that the NRC staff  
25 has done to see which one makes sense.

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1 I mean, it seems that we do have a body of  
2 knowledge there that at least I as a member of this  
3 Committee don't seem to have access to. I don't know  
4 whether the rest of the members are familiar with it,  
5 but I doubt it.

6 So, I mean, it would be nice to see that,  
7 especially since you have done it already, I mean.

8 MR. BARRETT: Yes. The original analysis  
9 was nowhere the rigor that 6850 requires now.

10 MEMBER APOSTOLAKIS: I understand that.  
11 I mean, you --

12 MEMBER SIEBER: It is just one plant. So  
13 it's not clear to me how you can extend that to some  
14 --

15 MEMBER APOSTOLAKIS: Yes. But it provides  
16 a basis for judging what Ray Gallucci did.

17 MEMBER SIEBER: It gives you an idea.

18 MEMBER APOSTOLAKIS: Yes. And also what  
19 kind of effort it takes to do it because under NFPA  
20 805, it seems to me that if you find -- as I recall.  
21 Maybe I'm wrong. As I recall, you're right. You're  
22 supposed to meet the regulations, but if you don't  
23 meet some of them, then you can argue in risk space.

24 MR. BARRETT: Right.

25 MEMBER APOSTOLAKIS: Right?

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1 MR. BARRETT: Right.

2 MEMBER SIEBER: You don't need to.

3 MEMBER APOSTOLAKIS: But you don't need to  
4 go back and comply. So, I mean, there is a way out of  
5 it depending on the quality of the risk assessment.

6 MEMBER SIEBER: That would be a basis for  
7 an exemption, but you can't just sit there and do  
8 nothing.

9 MEMBER APOSTOLAKIS: But is that  
10 consistent with a statement that it does a lot of  
11 work, paperwork? I mean, if you already have the PRA,  
12 why does it add a lot of work? But you just said  
13 that, right?

14 I'm sorry. I don't remember your name.

15 MR. BARRETT: Harry.

16 MEMBER SIEBER: The PRA is not  
17 state-of-the-art.

18 MR. BARRETT: Right. The original PRA is  
19 not state-of-the-art.

20 MEMBER SIEBER: They have to do the work.

21 MR. BARRETT: The one that they are doing  
22 now is state-of-the-art. They're using 6850 and --

23 MEMBER APOSTOLAKIS: When do you expect it  
24 to be completed?

25 MR. BARRETT: It should be complete by

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1 probably June of next year.

2 VICE CHAIRMAN SHACK: When you do your  
3 state-of-the-art PRA, you're going to consider  
4 multiple actuations, right?

5 MR. BARRETT: Yes.

6 MEMBER APOSTOLAKIS: Yes. So, I mean, is  
7 it clear to everyone? I mean --

8 MR. BARRETT: We are taking significant  
9 efforts to make sure we get our best chance at finding  
10 those multiple spurious risk --

11 VICE CHAIRMAN SHACK: But it seems to me  
12 that anybody doing a fire PRA is going to have to  
13 consider multiple --

14 MEMBER DENNING: Do they have to consider  
15 them as comprehensively as here? Because they will  
16 have screening criteria. And I guess can you tell me  
17 if you weren't -- you know, suppose you were not  
18 heading towards that.

19 If you are sitting there and you had to do  
20 this analysis, how long would it take you to do this  
21 analysis? And how difficult would it be to -- would  
22 you have to modify the plant to be able to accommodate  
23 it?

24 MR. BARRETT: I am not sure about that.  
25 What we would probably end up doing is using the

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1 guidance in NEI-0001, chapter 4, which is the risk  
2 analysis piece of that, which is, in essence, doing a  
3 mini PRA for the --

4 MEMBER DENNING: But you're not allowed to  
5 use that. I mean, by this generic letter, you're only  
6 allowed to do that if you're then going to look for  
7 exemptions.

8 MR. BARRETT: Right, yes. You're not  
9 doing 805. That's your only other --

10 MEMBER DENNING: Yes.

11 MR. BARRETT: I mean, you need to modify  
12 the plant or you --

13 MEMBER DENNING: Modify the plant. How  
14 long would it take you to do that analysis in --

15 MR. BARRETT: Guessing, I would say  
16 probably a year.

17 MEMBER DENNING: Probably a year. I mean,  
18 what is in here says 90 days.

19 MR. BARRETT: No way.

20 MEMBER DENNING: There's no way?

21 MR. BARRETT: No way.

22 MEMBER DENNING: You would think that --

23 MEMBER SIEBER: Well, you can tell in 90  
24 days roughly how long you think it's going to take you  
25 to do it.

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1 MEMBER DENNING: Absolutely.

2 MEMBER SIEBER: But that's not what  
3 they're asking.

4 MEMBER DENNING: But that's not what  
5 they're asking.

6 MR. BARRETT: I mean, your choices are to  
7 take your safe shutdown analysis and just say that  
8 everything in a given fire areas fails immediately.

9 MEMBER SIEBER: That is the way you used  
10 to do it.

11 MR. BARRETT: And you can't do it.

12 MEMBER SIEBER: No.

13 MR. BARRETT: I mean, with the acceptance  
14 criteria you have in Appendix R, having water level go  
15 out of the pressurizer, you can do that with just a  
16 couple of spurious actuations. If you do all of them,  
17 you're never going to make it. So I don't know how  
18 you do that in 90 days.

19 MR. WOLFGANG: This is Bob Wolfgang with  
20 again --

21 MEMBER DENNING: Go ahead, Bob.

22 MR. WOLFGANG: The 90 days, what we have  
23 currently in the generic letter is for functionality  
24 assessment. To submit any exemption requests,  
25 amendment requests, that's the six-month period.

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1 MEMBER DENNING: Yes, but what I am  
2 missing is to do the functionality assessment, don't  
3 you have to do basically the analysis?

4 MR. BARRETT: Yes. That is essentially an  
5 operability assessment. Are components operable? In  
6 order to know that, you have to do the analysis to  
7 know what gets damaged and when. There's no way  
8 you're going to do that in a short time, no way.

9 MEMBER DENNING: Dave, did you want to  
10 make some comments?

11 MEMBER SIEBER: Before we switch, one  
12 thing that you said that I think is important is you  
13 really can't get the core damage unless you have  
14 multiple spurious actuations.

15 MR. BARRETT: We have some singles that  
16 get us in trouble, and we're going to have to fix  
17 those. But as far as getting into the core damage,  
18 I'm not even sure --

19 MEMBER SIEBER: This would be opposing  
20 trains, too, right?

21 MR. BARRETT: Well --

22 MEMBER SIEBER: Train A, train B pairs.

23 MR. BARRETT: By the fire PRA methodology,  
24 you're really not even worrying about 3G2 or 3G3  
25 anymore. You're looking at fires anywhere and damage

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1 to all of the circuits.

2 MEMBER SIEBER: Right.

3 MR. BARRETT: So you're really looking at  
4 controlling fires and cable room fires and all of  
5 that. And, you know --

6 MEMBER SIEBER: But if you were to make  
7 the assumption that you only have one spurious  
8 actuation, you wouldn't get the core damage. And you  
9 could just say, "I don't need to do anything," right?

10 MEMBER APOSTOLAKIS: Well, it depends on  
11 what else fails.

12 MR. BARRETT: Yes. I think it depends  
13 largely on --

14 MEMBER SIEBER: It would be an on-fire --

15 MR. BARRETT: -- what other failures --

16 MEMBER SIEBER: -- a non-fire-induced  
17 failure, right?

18 MEMBER DENNING: There has to be a core  
19 damage frequency, though. I mean, when you said you  
20 wouldn't get core damage frequency with a single  
21 failure, you have to because you have other unrelated,  
22 but it's just very low.

23 MR. BARRETT: Also we are talking hot  
24 shorts here, but you also have fire-related damage,  
25 which takes the component out of service, which is not

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1 included in that spurious operation probability.

2 So it's a much more complicated things to  
3 get your arms around as far as loss of all electrical  
4 power, loss of indication, and all of that. It's more  
5 than that.

6 MEMBER DENNING: Yes?

7 MEMBER SIEBER: Thanks.

8 MEMBER DENNING: Dave?

9 MR. WOLFGANG: Excuse me.

10 MEMBER DENNING: Yes?

11 MR. WOLFGANG: This is Bob Wolfgang again.

12 So Duke's response to this generic letter  
13 would be we're addressing it. We're transition to  
14 NFPA 805. And we're going to address multiple  
15 spurious actuations in that transition.

16 MR. BARRETT: Yes, sir.

17 MR. WOLFGANG: And that is the total  
18 response we're looking for from --

19 MR. BARRETT: We will give you a schedule  
20 of when we think that will be done, yes.

21 MEMBER DENNING: Okay. If that is what  
22 you are asking for, you're going to have to change the  
23 generic letter.

24 MR. BARRETT: No.

25 MEMBER DENNING: My interpretation. Well,

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1 we'll look at that.

2 Dave, why don't you go ahead and say a few  
3 words?

4 MR. MISKIEWICZ: Okay. My name is Dave  
5 Miskiewicz. I'm from Progress Energy. I'm the lead  
6 PRA supporting the transition to 805 at all of our  
7 units.

8 MEMBER APOSTOLAKIS: PRA?

9 MR. MISKIEWICZ: I'm the lead PRA engineer  
10 supporting our transition.

11 MEMBER APOSTOLAKIS: I thought you said  
12 "elite."

13 (Laughter.)

14 MR. MISKIEWICZ: That does sound good.

15 A lot of the discussion I'm hearing, my  
16 perspective is probably a little bit different than  
17 the normal compliance.

18 MEMBER APOSTOLAKIS: That's why we want  
19 it.

20 MR. MISKIEWICZ: You know, there is  
21 uncertainty. And I am used to dealing with the  
22 uncertainty as how much probability I can assign to  
23 something, can I take credit for these actions and all  
24 the various things on there.

25 One of the things that strikes me is when

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1 I look at the bounding analysis and it seems like  
2 we're trying to get the best of both worlds. We want  
3 to address everything in totality and also assure that  
4 we don't have that risk.

5 You know, when I deal with traditional  
6 design basis, we are allowed one single failure. And  
7 we assume no off-site power. And we give an  
8 initiating event that happens, and that is a given.

9 PRA, we will look at multiple failures.  
10 And we may find things that are more vulnerable that  
11 weren't even addressed under compliance. And I see  
12 kind of a similar thing here except for instead of  
13 saying, "Address a single failure," we're looking at  
14 "You've got to find them all."

15 And that just seems like an impossible  
16 task. Even in the PRA world, we can model a lot of  
17 stuff, but we're still not going to get them all. But  
18 we try to find the significant things. We're trying  
19 to gear down to get the significant issues.

20 As far as the workload goes that I see on  
21 the generic letter, I think it would be significant.  
22 I'm not the circuit analysis person but when I start  
23 throwing in non-currently credited equipment into that  
24 list that I want circuits routed for and cables routed  
25 for, it is a big workload for the electrical guys who

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1 are going to be doing that work. And I would see that  
2 as a resource drain on the overall transition effort  
3 for me.

4 In fact, if I saw them, you know, all of  
5 a sudden, focusing on one area and not another area,  
6 I'm not even sure how they would be able to get all of  
7 them without doing the PRA perspective.

8 MEMBER APOSTOLAKIS: I am a little bit --  
9 I don't know what the right word is, but we keep  
10 talking about the workload. It seems to me we should  
11 be talking about the real issue.

12 Is there a real issue here? Is there a  
13 contributor to risk that we have not handled in the  
14 past or managed well? I mean, the workload I'm sure  
15 you will agree, too, it's a major contributor to risk.  
16 We have to do something about it.

17 MR. MISKIEWICZ: I agree.

18 MEMBER APOSTOLAKIS: And, you know, the  
19 thing that made me happy with Duke is that they are  
20 doing the PRA. They will consider the multiple hot  
21 shorts or spurious situations. Is your company doing  
22 something similar or --

23 MR. MISKIEWICZ: We are doing the PRA.  
24 And we're going to in the PRA model the hot shorts,  
25 the spurious actuations.

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1 MEMBER APOSTOLAKIS: According to the  
2 latest information we have and everything?

3 MR. MISKIEWICZ: When we say important,  
4 too, it's almost, you know --

5 MEMBER APOSTOLAKIS: You're not going to  
6 use .1? You're going to use .6, for example?

7 MR. MISKIEWICZ: We'll use whatever the  
8 methodology recommends.

9 MEMBER BONACA: You can go to Professor  
10 Apostolakis if you remember.

11 MEMBER APOSTOLAKIS: Give me a call. I'll  
12 tell you.

13 (Laughter.)

14 MR. MISKIEWICZ: It's .1. And we're  
15 working through those issues, but even doing that is  
16 going to be limited somewhat. You know, there are  
17 screening techniques and things used that we're going  
18 to work our way through as to which circuits really  
19 need to be evaluated.

20 MEMBER DENNING: Do you think the approach  
21 is clearly defined as to how you come up with a  
22 probability for these actuations?

23 MR. MISKIEWICZ: Right.

24 MEMBER DENNING: There is some randomness  
25 that one assumes in terms of which circuits can

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1 connect with which other circuits to --

2 MR. MISKIEWICZ: I think what we know now  
3 is better than what we knew ten years ago when we were  
4 dealing with this.

5 MEMBER DENNING: Yes. But it isn't  
6 obvious to me even what the best approach is to doing  
7 that within the fire PRA, let alone deterministically.

8 MEMBER APOSTOLAKIS: So the position,  
9 then, of at least you two gentlemen and maybe the  
10 industry is that this generic letter is unnecessary,  
11 that you are handling the issue of multiple spurious  
12 actuations via the PRA and as you transition to it --  
13 are you transitioning to 805?

14 MR. MISKIEWICZ: Yes, we are.

15 MEMBER APOSTOLAKIS: As you transition to  
16 805, you may have to come back to the NRC and, using  
17 risk arguments, request an exemption of some sort. Is  
18 that your position?

19 MEMBER BONACA: Well, I heard it  
20 differently.

21 MEMBER APOSTOLAKIS: What?

22 MEMBER BONACA: I heard it differently.  
23 I heard simply that the burden should be on the NRC to  
24 perform. Okay.

25 MEMBER APOSTOLAKIS: But they are handling

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1 it already.

2 MEMBER BONACA: Yes.

3 MR. BARRETT: We are handling multiple  
4 spurious in the PRA as part of the 805 transition.

5 MEMBER APOSTOLAKIS: And then what?

6 MR. BARRETT: And then we're going to  
7 follow the industry guidance and the regulatory  
8 guidance provided by the NRC. And depending upon  
9 where the thresholds fall in relation to the  
10 self-approval thresholds, if it's less than the  
11 self-approval threshold, then we'll end up  
12 self-approving an exemption in accordance with the NRC  
13 rules for 805 implementation.

14 MEMBER APOSTOLAKIS: Right, right.

15 MR. BARRETT: If it's over that threshold,  
16 then we'll end up having to --

17 MEMBER APOSTOLAKIS: Come back.

18 MR. BARRETT: -- contact the staff and  
19 work out whether we have to modify or whether we can  
20 leave the situation as is.

21 MEMBER APOSTOLAKIS: The conclusion one  
22 can draw from this is that you believe that this  
23 generic letter is unnecessary because there is already  
24 a process in place. Is that correct?

25 MR. BARRETT: For 805, for their plants.

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1 Not everyone is --

2 MEMBER APOSTOLAKIS: Why wouldn't another  
3 plant apply the same thing?

4 MEMBER SIEBER: It is an optional process.  
5 Some plants --

6 MEMBER APOSTOLAKIS: Oh, they don't --

7 MEMBER SIEBER: -- may decide not to do  
8 anything at all.

9 MEMBER APOSTOLAKIS: If they don't  
10 transition to 805, you mean?

11 MEMBER SIEBER: Yes.

12 MR. MARRION: If I may, Dr. Apostolakis,  
13 there are 40 plants that have submitted letters of  
14 intent to the NRC. The resolution of this issue for  
15 the 805 plans has yet to be determined. The approach  
16 is the use of the PRA, do the modeling -- all right?  
17 -- and then define that.

18 But that would be applicable to those 40  
19 plants. The other plants, the balance of the  
20 industry, have used any combination of the single  
21 failure to three or four failures.

22 You heard mention of NEI-001 that has the  
23 methodology, both -- two methodologies: deterministic  
24 and risk-informed. We piloted that at two plants.

25 And so we can't take credit for that

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1 anymore because of this new position with the generic  
2 letter. But I suspect that the solution will be had  
3 with the pilot exercise over the next several months  
4 to a year possibly and that that's the solution that  
5 needs to be evaluated for applicability to the non-805  
6 plants because, absent that, I don't see anyone coming  
7 up with a generic solution for the non-805 plants  
8 today. And it is going to be based upon PRA.

9 MR. MISKIEWICZ: Even in 805, though, when  
10 we do a fire PRA, there will be some iterative  
11 process. You know, we're dependent on the circuit  
12 analysis people giving us the information that we need  
13 to model. And so we're going to try to get risk to  
14 make sure we're modeling the right areas.

15 MEMBER SIEBER: Just the basic methodology  
16 of PRAs causes you to consider multiple spurious --

17 MR. MISKIEWICZ: If you model all of your  
18 singles and multiples from singles --

19 MEMBER SIEBER: That's the way it is.

20 MEMBER APOSTOLAKIS: But in the old days,  
21 in the first PRAs, I don't think we considered that.

22 MR. MISKIEWICZ: You modeled your singles.  
23 And they would combine in your results to give you  
24 multiples.

25 MEMBER SIEBER: Part of the process.

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1 MR. MISKIEWICZ: Yes. But you would still  
2 have to model the spurious event was a failure mode  
3 for that specific piece of equipment, --

4 MEMBER SIEBER: Right.

5 MR. MISKIEWICZ: -- which depends on the  
6 circuit analysis people telling you where that --

7 MEMBER SIEBER: So the philosophical  
8 discussion as to what the assumptions ought to be is  
9 sort of moot because the process of the PRA itself  
10 takes care of that if it's done thoroughly and done  
11 right.

12 MEMBER APOSTOLAKIS: One of the things  
13 that we don't do at this Committee is have  
14 presentations or briefings on the actual analysis that  
15 the industry is doing.

16 MEMBER SIEBER: Right.

17 MEMBER APOSTOLAKIS: I think that would be  
18 extremely beneficial to us if somehow we found a way  
19 to have the industry come and present a detailed PRA,  
20 fire PRA in this case. Anyway, that's a separate  
21 issue.

22 MEMBER DENNING: I think what we would  
23 like to do at this point is thank you gentlemen. And  
24 we may still ask you in the few minutes that we have  
25 left if we have some additional questions. We have

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1 the potential to hear about additional experimental  
2 work that could potentially change some perspectives,  
3 but I don't think we'll do that.

4 I think what we ought to do now is we  
5 would have some discussion while we still have the  
6 staff here and the industry here, we have some  
7 discussion? Would you agree, Graham, that we'll have  
8 some discussion here, see just kind of where we are  
9 sitting on this?

10 CHAIRMAN WALLIS: I was thinking about  
11 that. I think we certainly need discussion.

12 MEMBER SIEBER: Yes.

13 CHAIRMAN WALLIS: I think some of it needs  
14 to be in our working session, --

15 MEMBER DENNING: Yes.

16 CHAIRMAN WALLIS: -- rather than open  
17 session, but I think we can do some of it now. What  
18 little bit we can do now to clarify the situation  
19 certainly we should do now.

20 MEMBER ARMIJO: I have a question that may  
21 not be a discussion. Just in reading the staff's  
22 response to a lot of the comments received on the  
23 draft, there was reference to a lot of -- where is  
24 this thing, the screening tool, a risk screening tool,  
25 that the licensees develop a risk screening tool to be

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1 reviewed and approved by the staff.

2 This is a tool that would evaluate a  
3 variety of different multiple spurious actuations and  
4 sort them out and say, "These are the ones to worry  
5 about. And the rest we don't have to worry about."

6 What is your view? Does such a tool  
7 exist? Do you use such tools, both parties?

8 MR. MISKIEWICZ: We haven't kind of gotten  
9 to that step yet. I'm not exactly sure what the  
10 paragraph is you are referring to.

11 MEMBER ARMIJO: Yes. It's --

12 MR. MISKIEWICZ: But we can do  
13 sensitivities and say, "If I just fail the system, you  
14 know, a functional type of thing, if it's not  
15 significant, then I don't have to go down deeper and  
16 model all the individual spurious. I can screen it by  
17 saying it's not going to matter without doing the  
18 detailed modeling," you know.

19 MEMBER APOSTOLAKIS: The screening depends  
20 on a number of factors, this being one, but the other  
21 is the amount of fuel you have in your area, whether  
22 you can have a fire to begin with, the fire PRA.

23 MEMBER ARMIJO: I thought it was here is  
24 a large number of conductors that can cause spurious  
25 actuations of a large number of systems. And nobody

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1 has defined what scenarios are worrisome. It seems to  
2 me like it's a large number of mind-boggling barriers.  
3 And how do you sort those all?

4 MR. BARRETT: Let me address that.

5 MEMBER ARMIJO: Yes.

6 MR. BARRETT: One of the things that Duke  
7 has done -- and I think Progress is going to follow  
8 suit when they actually do their PRA -- is we have  
9 attempted to put our arms around the most significant  
10 multiples that we could think of by putting together  
11 an expert panel of people who know the plant, know the  
12 Appendix R design, no fire protection, and postulate  
13 these in an organized fashion, like going through  
14 PNIDs and plant design records to say, "All right.  
15 What are the real multiple spurious combinations that  
16 would really hurt me?" and capture those in scenarios  
17 so that they can be analyzed in detail in the fire PRA  
18 so that we can really look at the risk.

19 We're looking at it taking a three-pronged  
20 approach. We have the Appendix R analysis that says,  
21 "Here is all the safe shutdown stuff that I've got to  
22 have. Here are the cables and where they go in the  
23 plant. And then here is what gets damaged in each  
24 fire area."

25 And we take the expert panel. And we say,

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1 "Well, is there anything we missed? You know, is  
2 there something out there that because you end up  
3 flushing the toilet over here and you end up turning  
4 that light bulb on, the combination of things gets you  
5 something you didn't expect?" The expert panel is  
6 supposed to deal with that.

7 And then we also look at the PRA and true  
8 up all AOVs, true up all MOVs, and see if those kinds  
9 of things give us surprises that we didn't expect.  
10 Between the three of those, we think we're going to  
11 end up probably having 95 percent of the  
12 risk-significant scenarios.

13 MEMBER DENNING: For all of your plants,  
14 do you know where your cables are by tray?

15 MR. BARRETT: We didn't. We ended up  
16 having to pay to have that analysis done for us. I  
17 think it was originally determined in the '80s but was  
18 not captured in a database or anything. And we had to  
19 go back and --

20 MEMBER DENNING: But you had that for all  
21 your plants, do you?

22 MR. MISKIEWICZ: I wouldn't say all of the  
23 plants. That's a lot of work. In a lot of cases it's  
24 limited to the set of equipment that met the rule for  
25 the Appendix R compliance --

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1 MEMBER DENNING: It seems to say that --

2 MR. MISKIEWICZ: -- or our equipment that  
3 we want to credit from PRA perspective because there  
4 is risk-significant equipment in mitigation that is  
5 not within the scope of Appendix R right now. And  
6 that we'll add to the list. And some of those still  
7 need to be routed.

8 MEMBER DENNING: You do have additional  
9 cable routing that you would have to determine;  
10 whereas, you feel that you have already done the --

11 MR. BARRETT: There were some things in  
12 the PRA that we had not addressed in safe shutdown,  
13 and we're going to have to have --

14 MEMBER DENNING: Well, PRA is one thing.  
15 What about with this requirement? Does that change?  
16 Would you have to -- if this was imposed on you, do  
17 you think you have to do more cable tracing?

18 MR. BARRETT: What I'm talking about is  
19 our attempt to try to get our arms around all of the  
20 risk-significant scenarios.

21 MEMBER DENNING: Scenarios? Okay.

22 MR. BARRETT: So that's why we did the  
23 expert panel and all of that, to try to get our arms  
24 around things that we would have otherwise missed.

25 MEMBER DENNING: You keep saying

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1 "risk-significant." And we're in a space here where  
2 we're not necessarily risk-significant. It's broader  
3 than that.

4 MR. BARRETT: I think if you take all of  
5 the cables and you just fail them all and you say they  
6 all happen immediately, you're done.

7 MEMBER DENNING: You can't survive.

8 MR. BARRETT: Some of these areas you  
9 can't survive it.

10 MEMBER DENNING: Okay.

11 MEMBER SIEBER: On the other hand, from a  
12 risk standpoint, the set of cables that you have to  
13 know what the routing is becomes larger than the  
14 Appendix R set.

15 MR. BARRETT: Yes.

16 MEMBER SIEBER: But it is certainly not  
17 all of the cables. So there is going to be some  
18 physical work that has to be done if you don't have  
19 pull ticket. If you don't have the database, you  
20 can't --

21 VICE CHAIRMAN SHACK: In the NEI-001  
22 guidance, where, as I understand it, you do up to four  
23 failures, how do you select those four?

24 MR. BARRETT: A similar process with the  
25 expert panel and using Appendix R analysis, a similar

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1 process.

2 MR. FRUMKIN: This is Dan Frumkin from the  
3 staff.

4 One of the things that we have discovered  
5 about defining a failure is a lot of the analyses  
6 assume once spurious actuation, once spurious  
7 actuation, what the NEI or at least the risk, 2,403 --  
8 and I think NEI-001. They talk about multiple hot  
9 shorts.

10 Now, one pair of conductors coming  
11 together could cause numerous different spurious  
12 actuations. So I think that the staff and the --  
13 well, the staff has come out with 2,403 and has put it  
14 on the table.

15 We are looking for this hot short. That  
16 could cause whatever it could cause. We're not  
17 counting spurious actuations anymore. We're taking  
18 that hot short and saying, "Well, what could it  
19 cause?"

20 I think there was a situation where there  
21 was one cable or just a number, just a few conductors,  
22 or maybe it was even two conductors that could give an  
23 indication which could open all of 16 SRVs at one  
24 plant.

25 Now, a long time ago that might have been

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1 16 separate spurious actuations. And today we're  
2 looking at that as one pair of conductors coming  
3 together. And I think everybody is pretty much on the  
4 same page that yes, obviously if the circuits can  
5 cause all of those spurious actuations, we consider  
6 that.

7 MEMBER DENNING: Well, I guess a comment  
8 that I would have on generally what I have heard is  
9 that I think it's very clear that there are timing  
10 issues. If we go forward with the generic letter,  
11 then, at least in my interpretation of the generic  
12 letter, there are timing requirements that are not  
13 doable by the industry and that one would have to do  
14 some relaxation of that. And I don't see where just  
15 having the 30-day, where they can say, "It's going to  
16 take me longer as appropriate."

17 Now, it could be that maybe this should be  
18 more of an information-gathering generic letter,  
19 rather than one that is quite forcing the NRC's  
20 position about the need for multiple spurious  
21 actuations without a more relaxed position like NEI's.

22 I guess what I'm looking for are general  
23 comments as to people, where they are seemingly  
24 falling on this generic letter.

25 MEMBER MAYNARD: Well, I would agree with

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1 most of your comments there. First of all, I do  
2 believe that it clearly constitutes a backfit. We  
3 will get into some other things later on that, but we  
4 don't have to change regulations to be changing  
5 requirements. A change in staff position on what is  
6 acceptable for meeting a regulation, changing those  
7 position, also constitutes a backfit.

8 With that said, I would also like to say  
9 that this issue needs to be resolved. I think playing  
10 around too long about what is the right regulatory  
11 process isn't going to serve everybody's best interest  
12 either.

13 I think it is important. This issue has  
14 been around for 25 years. It needs to get resolved in  
15 an approach going forward as to what is it going to  
16 take to either make it go away as an issue or to  
17 actually fix it.

18 I think the 90 days, I think basically if  
19 it goes out the way it is, basically you're going to  
20 end up with everybody coming in with time request  
21 extensions. And so I don't think that's really the  
22 right thing to do there.

23 If it goes out the way it is, I think it  
24 needs to extend that time. I think it might be better  
25 to go out with what is truly an information request,

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1 to gather information to then be able to determine  
2 what the next steps are.

3 But, again, I don't think process should  
4 drag out for another 5 or 10 or 15, 20 years.  
5 Something needs to be done to put it on a resolution  
6 path.

7 VICE CHAIRMAN SHACK: Let me just come  
8 back to that for a second. I mean, we know what you  
9 expect from the 40 plants that are going for NFPA 805.  
10 What do you expect from the others?

11 MR. WOLFGANG: This is Bob Wolfgang again.

12 I think a number of them are going to come  
13 back and say, "We meet our licensing basis, and thank  
14 you very much. And good-bye."

15 MEMBER DENNING: Will they really say  
16 that? I mean, your --

17 MR. WOLFGANG: That is one thing.

18 VICE CHAIRMAN SHACK: Will you accept that  
19 answer?

20 MEMBER SIEBER: Send it over to  
21 enforcement.

22 MR. WOLFGANG: No. No, we won't. What we  
23 will hear from others is --

24 VICE CHAIRMAN SHACK: What would you  
25 consider an acceptable response from the others?

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1 MR. WOLFGANG: Well, "We don't address  
2 multiple spurious actuations. Here is our plan to  
3 address it to do" X, Y, Z. I don't know. "Do  
4 physical mods."

5 MEMBER DENNING: That's a six months'  
6 answer.

7 MR. WOLFGANG: Yes. That will be the  
8 six-month answer. But initially, yes, either you meet  
9 it or you don't meet it. We don't think we meet it.  
10 We think we meet it.

11 For the first round, that's all I think  
12 we're going to get.

13 MEMBER DENNING: Getting back to this  
14 backfit question, I'm not sure that ACRS is the  
15 appropriate one to answer that. Obviously it makes it  
16 easier for the regulatory staff if it's not a backfit  
17 question.

18 MEMBER BONACA: Yes. One thing that  
19 troubles me a little bit is, you know, is it a  
20 significant issue or is it not a significant issue?  
21 That's a plant-specific answer. And so we're not  
22 going to find out an answer to the question.

23 And I think that if we had to perform a  
24 generic evaluation to justify a backfit, I'm not sure  
25 that it could be done because, I mean, it's so

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1 specific to the plant, the age, to whatever the  
2 situation may be.

3 MEMBER DENNING: But this question of a  
4 specific issue, I think you can do a reduced analysis  
5 to determine. I think you can screen out stuff a  
6 priori --

7 MEMBER BONACA: I think so, too.

8 MEMBER DENNING: -- you know, so that it  
9 isn't such an onerous job to determine what's  
10 important and what's a potentially significant risk  
11 contributor here.

12 MEMBER BONACA: Clearly, I mean, something  
13 has to be done. I mean, we have new evidence in front  
14 of us. And I completely agree with you, Otto, that it  
15 can't wait. They have to be dealt with.

16 I think that, however, the industry needs  
17 more time to deal with this. They don't have a  
18 ready-made process by which they can screen this out  
19 and address it. So the issue is more the time.

20 Now, the next statement again, as reported  
21 to you, is the fact that we are not really the best  
22 charges of what is the most appropriate regulatory  
23 process to follow to go ahead with this.

24 MEMBER APOSTOLAKIS: Our job here is to  
25 judge the generic letter as presented to us.

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1 MEMBER BONACA: Yes.

2 CHAIRMAN WALLIS: I am just wondering how  
3 we add value to this. If we were a subcommittee, we  
4 might well say, "Look, we now know what the issues  
5 are. We think there must be a better way than having  
6 the agency send out this generic letter asking for  
7 things which may be impractical for some plants," but,  
8 then, there should be some way to work with the plants  
9 to figure out what is the right solution to this  
10 technical problem. I'm not sure.

11 We're also sort of a facilitator between  
12 industry and the agency, and that's not really our  
13 job, though, is it?

14 MEMBER SIEBER: Well, the other thing that  
15 is not our job is to try to figure out whether it's a  
16 backfit or not. That's a legal question.

17 CHAIRMAN WALLIS: Well, we don't even know  
18 how important it is because we don't have these proper  
19 risk analyses.

20 MEMBER DENNING: Well, having resolved  
21 these questions, I now turn it back to you, Mr.  
22 Chairman.

23 (Laughter.)

24 CHAIRMAN WALLIS: I can make a very  
25 decision, which is to take a break for lunch. We are

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1 going to be ethics-trained at 12:15. And then we go  
2 to work again at 1:30. Thank you very much for your  
3 presentations.

4 We'll take a break, and as a Committee,  
5 we're going to be back here, not on the transcripts or  
6 anything, for ethics training at 12:15. We'll start  
7 the official proceedings again at 1:30.

8 (Whereupon, a luncheon recess was taken  
9 at 11:33 a.m.)

A-F-T-E-R-N-O-O-N S-E-S-S-I-O-N

(1:33 p.m.)

CHAIRMAN WALLIS: Back into session. The next item on the agenda is another generic letter; first of all, underground cable failures that disable accident mitigation systems.

Our cognizant member is Mario Bonaca. I will hand over the meeting to him. Please go ahead, Mario.

MEMBER BONACA: Thank you, Mr. Chairman.

3) DRAFT FINAL GENERIC LETTER 2006-XX,

"INACCESSIBLE OR UNDERGROUND CABLE FAILURES THAT  
DISABLE ACCIDENT MITIGATION SYSTEMS"

3.1) REMARKS BY THE SUBCOMMITTEE CHAIRMAN

MEMBER BONACA: We have a presentation from the staff. They are proposing to issue a generic letter on inaccessible underground cable failures that disable accident mitigation systems.

We have recently become conversant with this issue through license renewal. You may remember that the GALL report requires for license renewal the existence of two programs: one, a program to detect the presence of water and the watering actions; and the other one is a program to test the cables and essentially-- so we are aware of the concern here.

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1 And the staff is now addressing this issue in the  
2 current licensing area.

3 And so, with that, I will turn to the  
4 staff. Mr. Mayfield?

5 3.2) BRIEFING BY AND DISCUSSIONS WITH  
6 REPRESENTATIVES OF THE NRC STAFF

7 MR. MAYFIELD: Good afternoon. I'm Mike  
8 Mayfield, the Director of the Division of Engineering.  
9 And my division is sponsoring this generic letter.

10 We're here this afternoon to seek ACRS  
11 endorsement to publish the generic letter. The  
12 generic letter, as Mr. Koshy will describe, provides  
13 some information to licensees on the significance of  
14 these potential failures, and seeks some information  
15 from licensees regarding the monitoring of these  
16 cables.

17 Tom Koshy from the Electrical Engineering  
18 Branch will make the presentation.

19 MR. KOSHY: Thank you, Mike.

20 As Dr. Bonaca mentioned to you, this was  
21 first brought to your attention as a problem during  
22 the license renewal hearing at the ACRS. The question  
23 was, is dewatering every ten years going to prevent  
24 the problem?

25 At that time, in light of the failures

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1 that we had noticed at the time, we thought of taking  
2 it as an operating reactor issue under Part 50. And  
3 we did some serious looking into see how big the  
4 problems are.

5 The safety concerns identified at the time  
6 were some of these underground and inaccessible cables  
7 supply power to some safety-related components. Using  
8 some examples here, the off-site power, the cable that  
9 brings the off-site power, to the safety buses.

10 The second would be the emergency diesel  
11 generator feeder. This is critical in those cases  
12 where the emergency diesel generator to building is  
13 physical apart from the main building so that the  
14 underground cables bring into power; and then the  
15 emergency service water pumps, these cases where the  
16 pump house is located again, you know, physically away  
17 from the plant so that the power supply to the service  
18 water pump has to go through underground cables.

19 And failure of one of these cables could  
20 affect multiple systems in these sense there could be  
21 a train, cooling off of safety systems, collectively  
22 influencing more than just one isolated system.

23 Most of these failures that we came across  
24 did not have any direct reference to having a  
25 qualification for this cable to withstand the moisture

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1 environment or, essentially, you know, in duct banks,  
2 if it is immersed in water, you know, can it  
3 withstand. That type of qualification had not been in  
4 existence for these cables that we came across.

5 MEMBER BONACA: Let me understand now,  
6 however. These are cables in safety-related  
7 applications?

8 MR. KOSHY: Yes.

9 MEMBER BONACA: Okay. So evidently on day  
10 one, when the plant was built, there was no  
11 expectation that the cable would be wetted?

12 MR. KOSHY: Yes. In fact, they thought it  
13 would stay relatively dry, but as duct banks develop  
14 cracks, you know, there would be traffic about it.  
15 And eventually these things crack. And depending on  
16 the water table, you know, it could be immersed for a  
17 long time or maybe a short time.

18 MEMBER BONACA: Well, in many cases, these  
19 cables are buried --

20 MR. KOSHY: Yes.

21 MEMBER BONACA: -- in the ground. So from  
22 day one, there was an expectation that they would see  
23 humidity and why we are not environmentally qualified.

24 MR. KOSHY: Either it was not specified at  
25 the time or they thought that, you know, the existing

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1 material at the time could withstand some level of  
2 moisture. For some reason, they did not specifically  
3 seek out.

4 The reason I stated that is, you know,  
5 much in the later period, now we have cables that can  
6 withstand such highly moist environment. In fact, I  
7 know of a case where they have run the cable to the  
8 river. That's for a --

9 CHAIRMAN WALLIS: But not forever.

10 MR. KOSHY: Excuse me?

11 CHAIRMAN WALLIS: Just because they are  
12 qualified doesn't mean they will survive forever in  
13 this environment.

14 MR. KOSHY: You are right, yes. Yes.  
15 They may not survive forever, but at least, you know,  
16 they have some demonstrated capability for a certain  
17 period that it can be even immersed in water and still  
18 do its function.

19 But all of that addresses, you know, the  
20 possibility that you need to know the condition of the  
21 insulation so that you have that confidence that it  
22 can do its function for the foreseeable future.

23 We went back into the history of the LERs  
24 that we have on record. We saw failure at 17 sites  
25 and cable replacements at 100 or so. And most of the

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1 faulty cables were not discovered until there was an  
2 operational failure.

3 Again, these are based on LERs, where the  
4 system has a redundant system or some reason, because  
5 of a plant trip or the failure was serious enough it  
6 prompted an LER.

7 MEMBER ARMIJO: What is your definition of  
8 a medium cable?

9 MR. KOSHY: 5 kV.

10 MEMBER ARMIJO: And above?

11 MR. KOSHY: 5 kV. Well, in the sense of  
12 when you go into 13 kV, you know, some people label it  
13 as medium also.

14 MEMBER ARMIJO: Okay.

15 CHAIRMAN WALLIS: High tension.

16 MEMBER SIEBER: Four-eighty volts to --

17 MR. KOSHY: Four-eighty will be below  
18 that. Yes. We will not call that medium, yes.

19 MEMBER SIEBER: Four-eighty is --

20 MEMBER BONACA: But you include those?

21 MR. KOSHY: Excuse me?

22 MEMBER BONACA: But you include those in  
23 the --

24 MR. KOSHY: Yes, we are including those  
25 because there are certain plants where the emergency

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1 diesel generator generates voltage at 480 and  
2 emergency service water and safety pumps are at 480  
3 volts, some small plants and early vintage.

4 MEMBER BONACA: Okay.

5 MR. KOSHY: So we wanted to include that  
6 also. That's why we went more than just medium  
7 voltage.

8 The EPRI data indicated about 65 cable  
9 failures. And later the white paper which NEI has  
10 submitted indicated about 55 failures for about 15  
11 plants.

12 Most of the cable failures have what in  
13 common? It's about 12 years of age. And the cable  
14 was subjected to some type of, you know, moisture  
15 environment, probably for a longer duration or a  
16 shorter duration. And these things were essentially  
17 common factors.

18 The cables, again, that we are focusing on  
19 is about roughly about six to eight cables, you know,  
20 depending on the design uniqueness, the cables that  
21 can have the most, let's say, significant impact on  
22 the plant.

23 MEMBER MAYNARD: The cable was about 12  
24 years old? You're saying that all of these failures  
25 were about the same age or --

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1 MR. KOSHY: No. More than that. There  
2 are some 20-plus.

3 MEMBER MAYNARD: Okay. All right.

4 MR. KOSHY: Yes.

5 CHAIRMAN WALLIS: It was at least 12 years  
6 old. At least 12 years. I was trying to figure it  
7 out. If it's every 12 years, that's pretty severe.

8 MR. KOSHY: You're right. Twelve and  
9 above. So in this generic letter, what we are  
10 focusing on is power cables that are within the scope  
11 of the maintenance rule, including cables connected to  
12 off-site power, emergency service water, and the other  
13 examples that I stated before, and those routed  
14 through underground or inaccessible locations, such as  
15 buried conduits, cable troughs, above-ground and  
16 underground. And these are the things that we are  
17 considering to be within the scope of this generic  
18 letter.

19 The benefits of this program are gaining  
20 confidence in the capability of the cable to respond  
21 to design bases events. To give you an example, at  
22 Turkey Point after the hurricane, the diesel had to  
23 run for about a week continuously. And thereafter for  
24 a month's period, the diesel had to come back on for  
25 other spurious power outages.

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1           So if you are looking into an accident  
2 where it has to be on a LOOP condition where these  
3 cables may need to be relied on for a few weeks. So  
4 we are not looking at a few hours of operation. The  
5 confidence needs to be gained for a period much higher  
6 than a few hours, which is usually the subject of our  
7 maintenance and surveillance activities.

8           MEMBER BONACA: Do you have examples of  
9 failures in service that were not exhibited during  
10 functional testing?

11           MR. KOSHY: What we have, the reported  
12 failures are a combination of both. Some in-service  
13 failures certain plants appear to have more than  
14 others. And others, when you start for surveillance,  
15 you find out that, you know, after a couple of hours,  
16 it fails.

17           So the LERs that we recorded are those  
18 cases where the plant impact was significant, so in  
19 the sense either operational. And if it is purely  
20 during a surveillance, we will not get an LER report  
21 on it.

22           So that's some of the problem that we are  
23 facing. The LERs that we received are so limited in  
24 number because, you know, it had to either bring a  
25 plant down or give an easy access situation for us to

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1 plant an LER report.

2 So that's why we are focusing on getting  
3 a handle on the extent of failures so we can engage  
4 them and see what other actions would be necessary.

5 CHAIRMAN WALLIS: Could you explain  
6 something to me?

7 MR. KOSHY: Yes.

8 CHAIRMAN WALLIS: I can understand  
9 off-site power sort of coming in on the underground  
10 cable. Why is diesel generator? Why does the diesel  
11 generator have underground cables? Is it part of the  
12 plant?

13 MR. KOSHY: Yes. For example, in some  
14 plants, the building is a separate building.

15 CHAIRMAN WALLIS: It's in a separate  
16 building. It's in a separate building.

17 MR. KOSHY: Yes. For example --

18 CHAIRMAN WALLIS: Okay.

19 MR. KOSHY: -- they have separate  
20 building.

21 CHAIRMAN WALLIS: They might be in a  
22 separate building?

23 MR. KOSHY: Yes.

24 CHAIRMAN WALLIS: That's very different  
25 from, say, something that comes from off-site power,

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1 where the cable may be a long cable from --

2 MR. KOSHY: Yes. That will be  
3 significantly longer. That will be from the  
4 switchyard. In some cases, you will have a situation  
5 closer to the plant, where you bring down to 13 kVR or  
6 so.

7 CHAIRMAN WALLIS: Okay. Thank you.

8 MR. KOSHY: The next benefit is we can  
9 prevent the unanticipated failures that cause plant  
10 transients by using the maintenance rule as the scope.  
11 We are also looking at challenges to the plant in the  
12 sense of what will give you a plant transient. So  
13 that is what is seen as the scope of this generic  
14 letter.

15 The next is you can use a convenient  
16 outage if you know the rate of degradation. Rather  
17 than taking, you know, unwarranted outages, you can  
18 schedule that cable replacement for a convenient  
19 refueling outage and do the replacement with minimum  
20 interruption.

21 CHAIRMAN WALLIS: Are these cables usually  
22 designed so they can easily be pulled through to  
23 repair them?

24 MR. KOSHY: No. It is very  
25 time-consuming, most of the --

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1 CHAIRMAN WALLIS: There's not a big duct  
2 in the cable and you just drag through a new cable?

3 MR. KOSHY: No.

4 CHAIRMAN WALLIS: No? You have to take it  
5 out? You have to dig it up?

6 MEMBER SIEBER: It's the whole thing. No.

7 MR. KOSHY: Well, pull-through is there,  
8 but the thing is it has a lot of staging. And you  
9 have energized equipment on both sides. So you need  
10 to essentially take some bus outages. So it is  
11 significantly time-consuming.

12 CHAIRMAN WALLIS: Yes, but you don't have  
13 to dig it out?

14 MR. KOSHY: Unless it is direct buried  
15 cable.

16 MEMBER BONACA: In fact, I mean, for  
17 example, yesterday during the review of Monticello,  
18 the majority of their underground cable, they're  
19 buried.

20 CHAIRMAN WALLIS: Those are usually  
21 utility duct or something, in other words.

22 VICE CHAIRMAN SHACK: This is direct  
23 buried.

24 CHAIRMAN WALLIS: Direct buried cable?

25 MR. KOSHY: Those are not exceptions.

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1 Usually you will have a duct bank with some sleeves in  
2 there so that you can pull through it.

3 MEMBER BONACA: And it depends on the age  
4 of the plant. I mean, Monticello is an older plant.  
5 They buried it, and that was it.

6 MR. KOSHY: So you have a wide variety on  
7 those?

8 MR. MORRIS: Tom, George Morris, EEEB.  
9 Some of the original cables that were pulled through  
10 duct bank, all of the original cables that were pulled  
11 through duct bank, were pulled through with the use of  
12 cable lubricant to reduce the friction. After they  
13 had been in there for a while, that lubricant has  
14 dried up.

15 MEMBER BONACA: It doesn't work.

16 MR. MORRIS: In some cases, it's almost  
17 like concrete.

18 MR. KOSHY: Okay. Moving on to some  
19 examples, Ocone is a success story where they found  
20 that two of the six cables had significant  
21 degradation. And they were able to monitor it and  
22 take the outage at a convenient time so that they can  
23 replace them.

24 Another example I am using here is Peach  
25 Bottom. When they experienced a failure, they decided

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1 to make a global replacement. You know, they didn't  
2 want to do any testing at all. And that's also a  
3 solution.

4 CHAIRMAN WALLIS: Now, is it always water  
5 that leads to degraded cables? It seems to me that  
6 you could have a cable and a duct which might just --  
7 you know, the insulation can over a period of time  
8 oxide or whatever it does. I mean, even in your house  
9 without water, you get cables that --

10 MR. KOSHY: Yes.

11 CHAIRMAN WALLIS: The insulation cracks  
12 and so on.

13 MR. KOSHY: This has some influence in the  
14 sense if it is a dry insulation and there is only  
15 cracks, chances are it will survive a little longer.

16 CHAIRMAN WALLIS: That's right, but it may  
17 --

18 MR. KOSHY: The presence of chemicals --

19 CHAIRMAN WALLIS: Makes it work.

20 MR. KOSHY: -- create default.

21 CHAIRMAN WALLIS: It's not essential that  
22 you have moisture, is it?

23 MR. KOSHY: Right. You're right. We are  
24 not trying to look at the root cause of what causes  
25 the failure. We are more interested in seeing,

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1       irrespective of the causes, let's have a program in  
2       place so that we can prevent such unanticipated  
3       failures and have a great confidence in the accident  
4       mitigation capability. So that's the focus we are  
5       trying to get because for --

6                   CHAIRMAN WALLIS: There is no routine  
7       measurement of, say, resistance of ground of a cable?  
8       There is no routine --

9                   MR. KOSHY: There is some technology  
10      developing that way, but online systems have not been  
11      doing that well. I think the industry is headed that  
12      way and there is some aggressive effort in the  
13      industry for coming up with something like that or,  
14      rather, building confidence in the systems that are  
15      now under development.

16                   Oyster Creek is an example where they  
17      replaced the cables and they had few repeated  
18      failures. This design is also unique. They  
19      essentially had this cable going about 200 feet away  
20      from the main plant as an extension of the safety bus.  
21      And this is remaining energized all the time. And  
22      that earlier had several failures.

23                   So the information that we are requesting  
24      is provide to us a history of the cable failures in  
25      the scope that I discussed just before and a

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1 description and frequency of the inspection, testing,  
2 and the monitoring programs in place. And if you do  
3 not have a monitoring program in place, explain to us  
4 why such a program is not necessary. So that is  
5 essentially what we are asking in --

6 CHAIRMAN WALLIS: So this is really  
7 information gathering. This isn't requiring an  
8 action?

9 MR. KOSHY: Right, right.

10 VICE CHAIRMAN SHACK: Now, are you  
11 distinguishing between a monitoring program and a  
12 functional testing program here?

13 MR. KOSHY: Okay. The explanation that we  
14 have given, in fact, I am addressing as a response to  
15 a public comment, what we are saying is the functional  
16 testing that you do that you energize for a short  
17 period doesn't give you any confidence that it will do  
18 it again.

19 VICE CHAIRMAN SHACK: Okay. So you're not  
20 counting that as a monitoring program?

21 MR. KOSHY: Yes. We are not.

22 MEMBER SIEBER: A surveillance test.

23 MR. KOSHY: These are the organizations  
24 that have given response to the first version that  
25 went out for public comments. And I will address the

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1 highlights of how we addressed those comments.

2 Cable failures are random. And,  
3 therefore, no NRC action is required.

4 CHAIRMAN WALLIS: It sounds like saying  
5 they're an act of God or something.

6 MR. KOSHY: Yes. We just explained the  
7 surveillance activity, which wouldn't give you  
8 confidence on its future performance. You need to in  
9 some way monitor the condition of that insulation so  
10 that we can build that confidence.

11 Again, you know, this is the small group  
12 of cable where you have this problem. Otherwise, the  
13 rest of the cable is in a dry environment. Next to  
14 selectable sealed-in concrete, you know, these cables  
15 should be the most reliable piece of equipment in a  
16 plant, you know, should not be failing for about 40  
17 years or, in fact, for 60 years, you know, if it is  
18 the environment and the conditions are right.

19 And I quickly explained before that the  
20 low-voltage cables are included because some of the  
21 early vintage plants have this 480-volt equipment for  
22 safety buses, diesel, and naturalized emergency  
23 service water, and service water equipment.

24 CHAIRMAN WALLIS: The original sentence is  
25 garbled. It doesn't matter. Essentially we have a

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1 period after impact, and that's all right. Scope is  
2 limited.

3 MR. KOSHY: Okay. Again, we just  
4 addressed this issue, why this basic surveillance  
5 tests of operating for a half an hour or two hours  
6 wouldn't be sufficient to gain that confidence for --

7 CHAIRMAN WALLIS: What you do is you put  
8 on them the voltage that they would have in operations  
9 and --

10 MR. KOSHY: No. You actually energize a  
11 --

12 CHAIRMAN WALLIS: Do you actually have to  
13 have current going? Do you have to current going  
14 through these cables to test them or does it have the  
15 voltage applied to them and see if there's a leakage?

16 MR. KOSHY: Yes. There are about eight or  
17 ten techniques in the industry.

18 CHAIRMAN WALLIS: There's a whole lot of  
19 techniques.

20 MR. KOSHY: Yes, yes. And the thing is  
21 the early technique was just apply very high voltage  
22 and make it fail. That was the most crude way of  
23 doing it.

24 MEMBER SIEBER: Meggering.

25 MR. KOSHY: Meggering is another method,

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1 but that has certain weaknesses, too.

2 MEMBER SIEBER: You have reflective  
3 techniques.

4 MR. KOSHY: Yes. Time domain reflects  
5 III, and about six or eight techniques are there. And  
6 there are still some under development. Collectively  
7 you have about two IEEE standards that go into details  
8 of the type of tests available and the level of  
9 confidence that you have based on the type of cable.

10 So depending on if you have a shield and  
11 what kind of shield and what type of rubber material  
12 is used, the level of confidence is different, you  
13 know, depending on the type of test that you do.

14 So there is some industry that two IEEE  
15 standards are available to address that and which one  
16 is better and which one is desired.

17 MEMBER SIEBER: You can get some pretty  
18 high voltages in these cables from switching  
19 transients.

20 MR. KOSHY: That's true.

21 MEMBER SIEBER: It will go well beyond the  
22 rating for a very brief period of time. And sometimes  
23 that's when the insulation fails.

24 MR. KOSHY: Yes.

25 MEMBER BONACA: By "surveillance test,"

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1 you mean surveillance of the equipment and this power  
2 by the cable?

3 MR. KOSHY: Right. You are giving normal  
4 voltage and normal function of a couple of hours, you  
5 know, like in the pump in service inspection or type  
6 of surveillance you will expect to run in for two or  
7 three hours, make sure it is for using the rate of  
8 flow and things like that. That's the type of test  
9 that will not give you a feeling of how good the  
10 insulation is. Will it last for the next two weeks of  
11 runoff?

12 The regulatory basis for our cable  
13 monitoring is we have added that what is seen in bold,  
14 that condition is something that we really did not  
15 have in the first version. And we are essentially  
16 saying that "assess the continuity of the systems and  
17 the condition of the components." So you need to know  
18 the condition of this insulation so that we can have  
19 that confidence on its performance.

20 MEMBER ARMIJO: Could you expand that?  
21 Condition based on electrical properties? Are you  
22 actually looking for physical condition? They're in  
23 accessible.

24 MR. KOSHY: These are inaccessible, but  
25 you do have state-of-the-art techniques available in

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1 electrical testing which will measure the testing of  
2 the insulation.

3 MEMBER ARMIJO: Okay.

4 MR. KOSHY: So if you can establish that  
5 the integrity of the insulation is reasonable, then  
6 you have that confidence that it will not fail in the  
7 most probable cases.

8 MEMBER ARMIJO: Thank you.

9 MR. KOSHY: The question was regarding  
10 multiple cable failures. The only example that we  
11 have collected in light of our efforts is a case where  
12 one insulation failure was in the circulating water  
13 pump, resulted in taking two other substations out  
14 with it.

15 The possibility that we are talking of is  
16 the fault itself causes a transient and sends some  
17 transient current. And if you have some near-failure  
18 equipment, that can be a cause for additional  
19 failures. You know, these are speculative problems.  
20 And this is the only example that we have on record  
21 for that.

22 Now, the modifications that we have done  
23 in light of the comments on this are editorial in  
24 nature, a good part. We revised the scope to include  
25 the above-ground and below-ground duct banks; removed

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1 the broadband spectroscopy because that's not a proven  
2 technique yet, but, again, that could be a technique  
3 available in the future; revised the requested  
4 information to include the type of service so that we  
5 will be able to know if there are repeated failures in  
6 a certain area. And we revised the data collection  
7 time to 60 hours.

8 CHAIRMAN WALLIS: So it would seem that  
9 there is still a gap between your view and the  
10 industry's view.

11 MR. KOSHY: Yes.

12 CHAIRMAN WALLIS: The industry had some  
13 pretty strong comments. And your modifications don't  
14 reflect large changes in response to their comments.

15 MEMBER SIEBER: Right.

16 CHAIRMAN WALLIS: So there would seem to  
17 be still a big gap between your view and the  
18 industry's view. Is that true?

19 MR. KOSHY: I will address that in the  
20 next slides along with the NEI white paper issues, in  
21 slides 16 and 17.

22 CHAIRMAN WALLIS: Okay.

23 MR. KOSHY: We presented this to CRGR.  
24 And CRGR asked us to do two improvements on the  
25 generic letter: to bring the focus on the power

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1 cables itself and also to add a safety-related example  
2 to show the significance of this failure on a plant.  
3 In the package that you have received, we have  
4 incorporated those changes.

5 We received the NEI white paper much after  
6 the comment period on May 1st. I have addressed the  
7 highlights in this coming couple of slides. One is a  
8 graded approach. Again, the number that you see on  
9 the top is the sections that correspond to the NEI  
10 white paper, 6.6.

11 The graded approach for monitoring and  
12 replacement of cables, the bullets are many cables do  
13 not power safety-related equipment; and the other one,  
14 graded approach to replacement and monitoring is best  
15 for safety and business reasons.

16 Our response is that we are only focusing  
17 on those that are significant. That's the very reason  
18 that we are using to bring the scope down to the  
19 maintenance rule. And we mentioned certain systems in  
20 there because to, let's say, overcome the variances  
21 and interpretations on that rule and also because  
22 those examples that we state there are the ones that  
23 have most impact on the plant in the sense affecting  
24 multiple systems.

25 Therefore, these are classified as most

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1 important because of these reasons. And, therefore,  
2 you know, it will be important to prevent the  
3 transients and also in supporting of mitigating the  
4 accident.

5 So that's how we have narrowed the scope  
6 and as to bringing down to only important cables and  
7 not all of the cables at large. And the numbers that  
8 you see in that white paper are some plants have like  
9 300-plus cables. And that won't be within the scope  
10 of maintenance rule.

11 The next one, the recommendations again in  
12 chapter 8, is provide dry environment, prepare for  
13 cable failures, and share failure resolutions.

14 Providing a dry environment -- again, you  
15 know, these are all installed cables. It's not quite  
16 practical. And pumping out would help. It will slow  
17 down the failure, but it cannot prevent the failure.  
18 It may take a little longer. And these cable failures  
19 could affect many systems. And the replacement of  
20 these cables is very time-consuming.

21 So if you have a valid accident mitigation  
22 method and at that time trying to make this cable  
23 replacement could be very difficult because the cables  
24 that run in the same duct banks could be helping the  
25 accident mitigation at that time. And your cable

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1 pulling and taking bus outages would not be desirable  
2 actions when you run into an accident environment or  
3 facing a LOOP or a station blackout.

4 And the technique is available there to  
5 have that reasonable confidence so that we can rely on  
6 these cables for continued operation.

7 That's all we have prepared for presenting  
8 to you. And if you have --

9 MEMBER BONACA: I have a question --

10 MR. KOSHY: Sure.

11 MEMBER BONACA: -- regarding in the  
12 generic letter, you talk about 23 LERs --

13 MR. KOSHY: Right.

14 MEMBER BONACA: -- and two monitor  
15 reports. Then the letter says that you believe that  
16 this is a very small fraction. That is the word used  
17 in the LER in the generic letter, a very small  
18 fraction of the actual failure to take place, which  
19 tells me that the number of failures that happen may  
20 be in the hundreds.

21 What is the projection? What does it mean  
22 that 25 in total is a very small fraction?

23 MR. KOSHY: It's very difficult to make  
24 such an estimate, but let me give a personal  
25 experience that I know of. I was at an AIT for a

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1 plant where they had such a cable failure. At that  
2 time they had six cable failures already when we had  
3 the AIT in the mid '80s. So that is repeated failures  
4 happening at one plant.

5 MEMBER BONACA: Okay.

6 MR. KOSHY: Again, I know of another  
7 Northeastern plant where they have all of these  
8 service water cable and emergency service water cables  
9 going through manholes. And they had splices in that  
10 also. And this manhole gets filled with water. And  
11 when the manhole cover knocks out, that's when you  
12 find out the splice failed. They had also quite  
13 repeated failures.

14 So certain plants may have a higher  
15 susceptibility because of groundwater and the design  
16 uniqueness. There may be some plants in absolutely  
17 dry environment, like WNP 2 in the middle of the  
18 desert. They may not have any cable problems because  
19 it's always dry. and if it all drains, it dries out  
20 so fast. So some plants may be fully exempt from this  
21 problem.

22 If the water table is a guide, those are  
23 the ones where you have high susceptibility and  
24 failures. And some plants are kind of glaringly  
25 different than others.

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1 MEMBER BONACA: The information you are  
2 requesting is regarding all cables, right, not only  
3 those in a weather condition?

4 MR. KOSHY: All cables and inaccessible.

5 MEMBER BONACA: Inaccessible.

6 MR. KOSHY: Yes.

7 MEMBER BONACA: Exactly. Okay.

8 MR. KOSHY: So plants where they did not  
9 have failures would not have anything to report. But  
10 if you had failures, we would like to know them --

11 MEMBER BONACA: Yes.

12 MR. KOSHY: -- so that we can kind of  
13 gauge, you know, are there repeated problems, what are  
14 the vulnerabilities, and based on that probably share  
15 the lessons and see if you have to take further  
16 action. Maybe it's down to a few plants. We do not  
17 know that because we lack the data to support that.

18 And the NEI white paper data shows about  
19 15 plants having about 45 to 50 failures. That could  
20 be an indication because they focused on underground  
21 and medium voltage only.

22 MEMBER BONACA: But your monitoring  
23 program that you're talking about doesn't deal only  
24 with cables that failed. It deals with cable aging  
25 that may be operable during functional testing that

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1 failed during demand, service.

2 So how are you going to gather information  
3 regarding these kind of cables?

4 MR. KOSHY: Okay. What we are saying is  
5 if those cables are within the scope of maintenance --

6 MEMBER BONACA: Yes.

7 MR. KOSHY: -- and they're underground and  
8 inaccessible, tell us if you have failures. And do  
9 you have a program when they have this susceptibility  
10 for failure to make sure that it wouldn't fail?

11 MEMBER BONACA: I understand.

12 MR. KOSHY: So you're not on the scope.  
13 Tell us what the failure is. And see how you monitor.

14 MEMBER BONACA: Right.

15 MEMBER ARMIJO: I have a question. How  
16 can you have a failure of above-ground inaccessible  
17 cable without water? Is it --

18 MR. KOSHY: Okay. What happens is, you  
19 know, even in some large conduit connections which go  
20 on the surface because of the variance, you get  
21 condensation built in there unless you have a way of  
22 venting it out.

23 MEMBER ARMIJO: Well, it could be a  
24 significant amount of water.

25 MR. KOSHY: You could collect all the

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1 time.

2 CHAIRMAN WALLIS: You get a humid day and  
3 a cold night.

4 MR. KOSHY: For the condensation and --

5 MEMBER SIEBER: You can get cable failures  
6 from things other than water.

7 MR. KOSHY: Yes, other chemicals and other  
8 leeching, yes.

9 MEMBER SIEBER: Chemicals, overheating.  
10 You know, that degrades insulation or defect in  
11 splices, for example, if --

12 MR. KOSHY: Yes. Splices is another  
13 vulnerable point.

14 MEMBER SIEBER: It's handmade.

15 MEMBER MAYNARD: A couple of questions.  
16 On the provided inscription of the frequency of all  
17 inspection testing, monitoring, are you talking about  
18 what is currently in place or are you asking the  
19 licensee to go back to day one for all of what testing  
20 has been done?

21 MR. KOSHY: We are asking for what you  
22 have in place now so that you can put in place such  
23 unanticipated failures.

24 MEMBER MAYNARD: Okay. And the other  
25 thing is, is the staff coordinating in any way? This

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1 is requesting this information to be within 90 days.

2 MR. KOSHY: Right.

3 MEMBER MAYNARD: And it would appear to me  
4 that if the other generic letter on the spurious  
5 actuation gets issued, a lot of the same resources  
6 could be required or needed for a lot of these  
7 activities, both dealing with electrical circuits,  
8 just --

9 MEMBER SIEBER: This one is pretty --

10 MR. KOSHY: We will work with the Generic  
11 Communications Division so that we would be sensitive  
12 to that.

13 CHAIRMAN WALLIS: So what are you going  
14 with the information when you get it?

15 MR. KOSHY: What we are hoping is that  
16 depending on, let's say, the breadth and depth of the  
17 problem as to why widespread, we may have to think of  
18 NRC action if that warrants it. We have --

19 CHAIRMAN WALLIS: You think that there  
20 might be some problem. You have this sort of you  
21 almost call it a fishing expedition, where you get all  
22 of this information. And then you look at it and say,  
23 "Aha. Now we have to do something or not." You're  
24 not quite sure what you are going to find.

25 MR. KOSHY: Okay. We know it is a

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1 significant problem in the light of what I explained  
2 to you.

3 CHAIRMAN WALLIS: There have been events,  
4 right.

5 MR. KOSHY: Yes. We have been having  
6 events, which either the plant is out or disabled  
7 safety systems. And those things kind of give you a  
8 flavor of significance.

9 CHAIRMAN WALLIS: But the result of all of  
10 this information gathering might be that you decide  
11 everything is okay as it is now.

12 MR. KOSHY: If the industry has, let's  
13 say, commitments to prevent such failures, yes. But  
14 if you are seeing failures and repeated failures, we  
15 have to rethink what we should be doing. Okay? We  
16 are not there yet. We need to --

17 MR. MAYFIELD: Professor Wallis, this is  
18 Mike Mayfield from the staff. As we assess the  
19 results we get back from this, we would have to make  
20 a decision whether generic action is warranted or is  
21 there some plant-specific action that is warranted or  
22 things are being managed appropriately as it is. And  
23 we just don't know until we get the results back. We  
24 have enough indicators to make us believe that we need  
25 to go --

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1 CHAIRMAN WALLIS: I think the industry  
2 response to the public comments was everything is  
3 fine, we're doing the right thing now. You just want  
4 the assurance that it really is so.

5 MR. MAYFIELD: That might be the outcome.  
6 And we'll have to see what actually comes in.

7 MEMBER SIEBER: The third question sort of  
8 tips your hand as to what you want. And it says if a  
9 monitoring or surveillance program is not in place,  
10 explain why such a program is not necessary.

11 In other words, here's a plant with  
12 failures. And they're not testing anything.

13 MR. MAYFIELD: We might want to chat with  
14 them a bit.

15 MEMBER SIEBER: You gave them the hint.  
16 You ought to test something.

17 MEMBER BONACA: Or you may have a plant  
18 where there have been no failures and you have no  
19 significant power equipment. Then why should you even  
20 have a test? I mean, then you have a threshold for  
21 saying, "We don't need it."

22 MEMBER MAYNARD: I've got a feeling when  
23 you get all of this, the actual number of failures if  
24 you divide it by the number of plants and the number  
25 of operating years wouldn't look that great, but when

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1 you go to group them, there may be some areas where  
2 you --

3 MR. MAYFIELD: Exactly. And that is not  
4 an uncommon outcome from getting this kind of  
5 information.

6 MR. KOSHY: One thing you find out is the  
7 data that we have at this time is based on normal run  
8 and surveillances, not an extended use of like two,  
9 three weeks. So what we are trying to see is gain  
10 confidence that these cables can continue in service  
11 for two or three weeks if there is a station blackout  
12 or some reason and we can continue to rely on these  
13 cables for that safety function.

14 MEMBER BONACA: Yes. That is a very  
15 important issue, you know, the failure to run. So the  
16 equipment starts, but then it won't run for as long as  
17 it has to. And that's trickier because, I mean, the  
18 number of failures experienced to date doesn't give  
19 you a specific insight on these cables. And that's  
20 their function.

21 MR. KOSHY: Right.

22 MEMBER BONACA: Any additional questions?

23 (No response.)

24 MEMBER BONACA: If not, I thank you for  
25 the presentation.

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1 MR. KOSHY: Thank you.

2 MEMBER BONACA: I think Mr. Marrion of NEI

3 --

4 MR. MARRION: Yes.

5 MEMBER BONACA: -- would like to make a  
6 statement. NEI, of course, produced that white paper  
7 that is quite interesting on this issue.

8 MR. MARRION: Good afternoon. I'm Alex  
9 Marrion, the Senior Director of Engineering at NEI.

10 I do have a couple of comments I want to  
11 make about basically what we heard. We haven't seen  
12 the staff disposition of the public comments that have  
13 been submitted. Nor have we seen the current version  
14 of the proposed generic letter.

15 But I have to tell you I am confused. And  
16 the reason for that confusion is that a couple of  
17 years ago, I received a letter from the Electric  
18 Systems Branch Chief articulating concern with a  
19 potential common mode of medium voltage cables. And  
20 the common mode failure mechanism was water training.  
21 This was based upon a review of 20-some odd licensee  
22 event reports.

23 We had a public meeting with the staff to  
24 understand, get a little more of an understanding of,  
25 their concerns. And we looked into the licensee event

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1 reports, and they had -- I'm trying to remember. I  
2 think there was only one or two that had a potential  
3 for being related to the water-training phenomenon  
4 that the staff was concerned with.

5 But it became clear to us that we needed  
6 to develop a document that would be an educational  
7 piece, if you will, primarily focusing for the  
8 industry, but we also felt that the NRC could possibly  
9 benefit from it. And that was the basic objective for  
10 the white paper that we developed.

11 The purpose for the educational piece was  
12 to articulate a clear understanding of the  
13 water-training phenomenon to articulate our assessment  
14 of the licensee event reports that the staff was using  
15 as a basis --

16 CHAIRMAN WALLIS: You're talking about a  
17 water-training phenomenon?

18 MR. MARRION: Water training, yes.

19 CHAIRMAN WALLIS: Training. Oh, I'm  
20 sorry.

21 MR. MARRION: Yes, water training. I'm  
22 sorry. I've got a cold, and I'm a little congested.  
23 I apologize.

24 CHAIRMAN WALLIS: That's my  
25 misunderstanding. I'm sorry.

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1 MR. MARRION: -- and also provide us a  
2 technically based understanding of the application of  
3 that phenomenon to basic cable configurations and  
4 insulation systems that exist in the power plants  
5 today or not in the power plants but exist in these  
6 applications today.

7 We concluded that you can't make a general  
8 statement that water training is of concern because  
9 it's not applicable to every cable configuration and  
10 insulation system that's in the field today.

11 It appears that the staff is attempting to  
12 require a cable-monitoring program. I'm not familiar  
13 with the details of the maintenance rule, but I know  
14 that the equipment to which these cables are  
15 terminated are monitored in the maintenance rule.

16 And since the cables aren't active  
17 components, I'm not sure whether they should be  
18 included in the maintenance rule or not. But  
19 fundamentally if the staff expectations and basis in  
20 this generic letter are not clear, you have the  
21 potential of a generic letter basically undermining a  
22 regulation.

23 I don't know if the staff has done a  
24 review with the maintenance rule folks within NRR, but  
25 I would recommend that be done before this is

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1 submitted.

2 CHAIRMAN WALLIS: You're implying this,  
3 but, in fact, they just say they're gathering  
4 information. And it's not clear that they intend to  
5 do anything which would change the regulation in any  
6 way or interfere with regulation. You don't know what  
7 they're going to do.

8 MR. MARRION: And the licensee has to  
9 document a justification of why they don't have a  
10 cable-monitoring program. That is --

11 CHAIRMAN WALLIS: But you're implying that  
12 something downstream is going to require this. That's  
13 not actually a --

14 MR. MARRION: No. I'm implying there may  
15 be a conflict between what the generic letter is  
16 asking for and what is required by the --

17 CHAIRMAN WALLIS: You're asking for  
18 information, rather.

19 MR. MARRION: Well, okay. That's one way  
20 of looking at it. It is a request for information or  
21 an attempt to require a cable-monitoring program. And  
22 I'll let you folks decide how you want to do that if  
23 they want to interpret that.

24 I think that, you know, the staff has made  
25 some comments about, you know, what their concern is.

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1 And it's not clear to me. I have to tell you I'm  
2 confused. Maybe it's because of our involvement over  
3 the past several years, but I have yet to see any kind  
4 of risk analysis or any kind of statistical analysis  
5 conducted by the NRC to articulate some level of  
6 confidence that they find unsatisfactory relative to  
7 the performance of the cable or the equipment.

8 We have attempted to do some statistical  
9 work in our white paper based upon the survey that we  
10 had conducted. I'm not happy with the fact that we  
11 didn't get 100 percent of the utilities to respond,  
12 but we got on the order of 80 percent, I think, 79.  
13 something. That has some benefit.

14 My concern at this particular point is  
15 when the generic letter is finally issued, based upon  
16 what I heard this afternoon, we're going to have to  
17 request a meeting, a public meeting, and probably  
18 document further clarification of what the NRC is  
19 really interested in this information request as they  
20 go forward because it's not clear at this particular  
21 point in time. And that's all I have to say. I would  
22 be more than happy to answer any questions you may  
23 have.

24 (No response.)

25 MR. MARRION: Okay. Thank you.

1 CHAIRMAN WALLIS: You're welcome.

2 You were suspicious that if they gather  
3 this information, then they might use it to require  
4 something which they wouldn't be able to do if they  
5 didn't have the information?

6 MR. MARRION: No. It's not clear what  
7 concern is trying to be addressed by the request for  
8 information.

9 CHAIRMAN WALLIS: Well, the concern is  
10 that these cables will fail. It's a simple concern.

11 MR. MARRION: Well, where does that  
12 concern stop? Do you stop at these cables or do you  
13 continue that concern at the equipment, et cetera,  
14 that is under continuous surveillance programs and  
15 testing? I mean, where does it end?

16 And it's a concern about having possible  
17 unanticipated failures? Well, where do you stop  
18 asking that question now that you started on medium  
19 voltage cables and the small population of medium  
20 voltage cables, I suspect?

21 So there are some real issues that have to  
22 be addressed here because the utilities are going to  
23 want to be responsive to the generic letter. My job  
24 is to make sure that we understand it adequately so  
25 the utilities will be responsive, but right now I'm

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1 not sure we have that understanding.

2 MEMBER BONACA: Well, if I understand it,  
3 I mean, the issue has to do with two things. One is  
4 inaccessible equipment that cannot be visually or  
5 other means inspected -- so it's a very narrow family  
6 -- and then equipment that is really in accepted  
7 applications.

8 And clearly equipment is seeing a water  
9 condition or wetness that -- so it's a pretty unique  
10 and narrow population, but I think at least I am  
11 interested to know what kind of equipment is being  
12 powered by this kind of cable out there. And if it is  
13 something critical, a generic letter or whatever,  
14 connection to off-site power, you know, it's a unique  
15 concern.

16 I mean, we addressed it and discussed it  
17 during license renewal because it was significant.  
18 And the industry and the NRC worked together on a goal  
19 inspection program for those cables.

20 And where does the aging start? I mean,  
21 does it start with a theatre of operation or does it  
22 start before? Clearly there is degradation taking  
23 place at some point. I realize I don't know all there  
24 is necessary to know about that.

25 MR. MARRION: If I may just offer a couple

1 of comments?

2 MEMBER BONACA: Yes?

3 MR. MARRION: The aging phenomenon begins  
4 from the time that the cable is shipped from the  
5 manufacturer's facility.

6 MEMBER BONACA: That's right.

7 MR. MARRION: And it's exacerbated by  
8 environmental conditions as well as operational  
9 conditions that wind up stressing the cable insulation  
10 system. And a submerged, wetted environment for  
11 certain insulation systems has the potential of  
12 increasing the aging or the rate of aging degradation,  
13 et cetera. That is well-known.

14 The equipment that's affected here  
15 includes diesel generators at some plants at 4,000 or  
16 4,160 volts as well as other plants at 6.9 kV. I  
17 don't know about -- I think one of the staff was --  
18 Tom made a comment about some diesel generators  
19 operating in the 480 volts. If that's indeed the  
20 case, then that's indeed the case.

21 But mean voltage cable in the industry is  
22 characterized as 2,000 to 15,000 volts. So I'm hoping  
23 that the generic letter will be very clear of  
24 articulating the 480-volt applications. And is it  
25 only for that particular piece of equipment or is it

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1 for something else? That's one of the points of  
2 clarity that's needed.

3 We tried to capture in our white paper --  
4 and I hope you've read it; we've made it available to  
5 you -- the current state of understanding of cable  
6 insulation systems at this voltage level and  
7 underground applications and which insulation systems  
8 are susceptible to water damage over time.

9 We have encouraged the utilities to  
10 prepare for such failures because if you look at the  
11 age of the fleet, we are approaching the end of  
12 service life of a lot of these cables. It's typically  
13 30, 35, 40 years based upon normal environmental  
14 conditions.

15 And our recommendation to the industry was  
16 don't wait for a failure before you have to deal with  
17 this problem because this is not the kind of cable  
18 that you typically keep large quantities in inventory  
19 at the warehouse, et cetera. And if you're not  
20 prepared, you will have an extended outage should you  
21 have such a failure.

22 I don't know if the generic letter is  
23 going to speak to that, but I also know that there is  
24 not a cable-monitoring system that is applicable and  
25 effective and available to the utilities today.

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1           There are some testing techniques that are  
2 effective for certain kinds of insulation  
3 configurations. And our white paper speaks to that.  
4 But based upon the information I have gotten from  
5 EPRI, who is pursuing research in this area, et  
6 cetera, that there isn't one technique that would be  
7 useful. So okay?

8           MEMBER BONACA: Thank you.

9           MR. MARRION: Thank you.

10          MEMBER BONACA: Yes. I think we're  
11 scheduled for some closing remarks. Is there?

12          MR. MAYFIELD: Just very briefly. We  
13 believe we have articulated why we need the generic  
14 letter. If indeed there is substantive confusion or  
15 misunderstanding once we have published the generic  
16 letter, we would, as always, be more than willing to  
17 meet with the industry and make sure that there is a  
18 common understanding of what we're asking for.

19          This generic letter has been in process  
20 for a while. And we do believe we need to move  
21 forward to get the generic letter published and allow  
22 licensees the opportunity to engage with it. We will  
23 be mindful of any conflicts with other generic  
24 communications that are going forward where we may be  
25 imposing unreasonable time constraints and resource

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1 constraints on the licensees. That's something that  
2 we will pay attention to and go back and pulse with  
3 the generic communication staff and the other  
4 technical staff to make sure we're online there.

5 With that, unless the Committee has other  
6 questions for the staff, I believe we have presented  
7 to you the information that we wanted to present. And  
8 we look forward to receiving a letter from you. Thank  
9 you.

10 MEMBER BONACA: Any other questions for  
11 Mr. Mayfield?

12 MR. FALLON: I have a question. Mike  
13 Fallon with Constellation Energy.

14 For the license renewal applicants that  
15 have submitted under the GALL report, these cables are  
16 all in the scope of license renewal, have been  
17 addressed in their applications. Are they being asked  
18 to resubmit this information again?

19 MR. KOSHY: This is Thomas Koshy.

20 This generic letter will fall under the  
21 Part 50 program, in which case we are addressing,  
22 let's say, something more than what was addressed in  
23 the renewal program. So there is a need for making  
24 separate submittal to the NRC in response to this  
25 generic letter.

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1 MR. FALLON: All of the cables that you  
2 have addressed, all of the safety-related cables, are  
3 in the scope of license renewal. And whether they're  
4 480-volt or they're medium voltage, they're addressed  
5 in those applications.

6 MR. MAYFIELD: Okay. Let me comment.  
7 This is Mike Mayfield from the staff.

8 You raise a good point. It is something  
9 we will look at and make sure we're not asking you to  
10 unnecessarily duplicate information. But that is a  
11 fair question, something that we'll make sure that --

12 MEMBER BONACA: Well, I am not aware that  
13 license renewal applications have the summary of all  
14 of the failures that have taken place. We are going  
15 to get to the information.

16 MR. MAYFIELD: We don't think we are in  
17 conflict, but it's a fair question. And we'll look to  
18 make sure we are not asking an unreasonable question.

19 CHAIRMAN WALLIS: But you will be looking  
20 at plants which doesn't necessarily have license  
21 renewal in prospect.

22 Are we through with this item now or --

23 MEMBER BONACA: Are there additional  
24 questions for the staff, for industry, for us?

25 (No response.)

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1 MEMBER BONACA: If none, I think it's  
2 over.

3 CHAIRMAN WALLIS: Thank you.

4 MEMBER BONACA: And we open it up back to  
5 you, Mr. Chairman.

6 CHAIRMAN WALLIS: Now, I really am  
7 reluctant to take a break for an hour. I wonder if we  
8 couldn't work on -- is it okay, staff who is an expert  
9 on this? Can we work on Mario's letter on this issue  
10 right now on just a preliminary basis?

11 Let's go off the record and work on his  
12 letter for half an hour or an hour.

13 MEMBER SIEBER: We have to come back.

14 CHAIRMAN WALLIS: Can we do that? You're  
15 not ready? We do have a draft letter. Will the  
16 Committee agree to work on his letter? We can discuss  
17 it now, but I think we can go off the record and  
18 discuss our reaction to this generic letter and work  
19 on our letter until about 3:00 o'clock. Is that okay  
20 with the Committee?

21 So let's do that. We'll come off the  
22 record now, and we will work on this letter until  
23 about 3:00 o'clock. We'll have some discussion now  
24 off the record.

25 (Whereupon, the foregoing matter went off

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1 the record at 2:25 p.m. and went back on  
2 the record at 3:18 p.m.)

3 CHAIRMAN WALLIS: We will come back on the  
4 record, come back into session.

5 CHAIRMAN WALLIS: The next item on the  
6 agenda is, let's see now, interim staff guidance. Is  
7 that what it is?

8 MEMBER BONACA: Yes.

9 CHAIRMAN WALLIS: And I will again call on  
10 Mario Bonaca to lead us through this one.

11 MEMBER BONACA: Okay.

12 4) INTERIM STAFF GUIDANCE AGING MANAGEMENT PROGRAM

13 FOR INACCESSIBLE AREAS OF BOILING WATER REACTOR

14 (BWR) MARK I CONTAINMENT DRYWELL SHELL

15 4.1) REMARKS BY THE SUBCOMMITTEE CHAIRMAN

16 MEMBER BONACA: We have the staff here to  
17 provide us with an overview on the proposed license  
18 renewal interim staff guidance on steel containment of  
19 BWR Mark I containments.

20 We have reviewed a number of BWRs. And  
21 we have often asked the question on the status of the  
22 steel liner. And we have seen different proposals by  
23 licensees, some of them planned inspections, only  
24 metric inspections. Some of the others don't.

25 And the staff is using a successful

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1 process that has been successful in most of the  
2 license renewal applications to date, the ISG process,  
3 as a means of proposing an approach that they expect  
4 the licensees to follow regarding this particular  
5 item.

6 And so the staff has come here to give us  
7 an overview of this process and what they are  
8 proposing to do. And I will let the staff go ahead.  
9 I don't know if Mr. Gillespie or Mayfield --

10 MR. GILLESPIE: Yes. If I could, just  
11 some opening comments to put in context what Linh and  
12 Hans are going to go through. Not only did we do a  
13 couple already, but we've got something like seven  
14 Mark I's lined up in the queue. And we have a number  
15 of very controversial ones in New Jersey,  
16 Massachusetts, and Vermont, where there is actually a  
17 lot of public interest. And we had no position on the  
18 liner itself.

19 There are some caveats or I'm going to say  
20 some wiggle room in this position I'd like to  
21 highlight to the Committee by way of how the staff is  
22 approaching this because a question at the meeting  
23 yesterday at Monticello was, why is it different plant  
24 to plant if you're trying to apply a consistent  
25 approach.

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1           This is kind of an approach for the plant  
2           that's got almost like the optimum conditions, of  
3           which Monticello with their leakage control programs  
4           and some things they were doing was.

5           Browns Ferry, an earlier one, which  
6           committed to doing some other measurements, actually  
7           had an operating history of having leaks. And so they  
8           had moisture content in there. And so we actually  
9           have -- this is a minimum condition, as we would look  
10          at it.

11          And there are also some wiggle words,  
12          quite honestly, in this. And that's where it says  
13          first you have to establish a degradation rate,  
14          basically. And then if you get moisture, this  
15          basically treats moisture in the outside of the shell  
16          the same as visible accelerated corrosion on the  
17          inside.

18          And we're using the ASME code kind of  
19          enhanced inspection, but, instead of referencing the  
20          code, we described the enhanced inspection in it in  
21          case the code changes in the future.

22          So we're bringing definition to an  
23          equivalence to inside and outside indications. And  
24          there is still a lot of room on how you establish the  
25          rate and what is the credibility of the rate.

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1           And so if you have a history as a facility  
2 of having leakage and, therefore, moisture in there,  
3 then I think the Committee should expect the staff in  
4 establishing the rate in those wiggle rooms because it  
5 says if you have moisture, reestablish your rate again  
6 -- and the only way to factually reestablish the rate  
7 is likely do a UT measurement and then connect the  
8 dots again. Literally a simplistic way of looking at  
9 it is a regression line between the now additional  
10 point.

11           And so Hans in his efforts as a reviewer  
12 still has a lot of room in what are the uncertainties  
13 in establishing the rate. And it's those  
14 uncertainties which kind of differentiate one plant  
15 from another. How do you reduce those uncertainties  
16 given different operating histories?

17           And so that's really how come Monticello  
18 is different from Browns Ferry. It's strictly  
19 operating history and the uncertainty involved with  
20 known moisture leak on multiple occasions.

21           So, with that, let me turn it over to Linh  
22 because that's just kind of the context. Linh, take  
23 it away.

24           4.2) BRIEFING BY AND DISCUSSIONS WITH  
25           REPRESENTATIVES OF THE NRC STAFF

1 MS. TRAN: Good afternoon. My name is  
2 Linh Tran. And I'm the Project Manager with the  
3 Division of License Renewal. And this is Hans Ashar.  
4 He's a senior civil engineer with the Division of  
5 Engineering.

6 We are here this afternoon to present the  
7 proposed license renewal interim staff guidance for  
8 the inaccessible area of the BWR Mark I drywell  
9 containment shell.

10 The purpose of this ISG is to provide  
11 guidance to future applicants on the information that  
12 is needed to be included in the license renewal  
13 applications for addressing the inaccessible area of  
14 the drywell shell.

15 Now, the proposed ISG here does not impose  
16 any no new technical requirement. And in previous  
17 license renewal application review by the staff, we  
18 usually can obtain the information in the applications  
19 or through the request for additional information.  
20 And usually we will get the information from the  
21 applicant.

22 The information provided by the applicant  
23 is sufficient for the staff to make its determination.  
24 However, it is not the most efficient way because of  
25 the RAI back and forth. And in an effort to reduce

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1 the number of RAIs, this proposed ISG would identify  
2 the information up front, so for the future  
3 applicants, what they should include in the LRAs, I  
4 guess, to make the staff review more efficient,  
5 information such as inspection results or analysis  
6 that would help the staff make the determination  
7 whether the containment would perform its intended  
8 function for the period of extended operation.

9 Past operating experience in the Mark I  
10 steel containments indicate that when water is  
11 discovered in the bottom outside area of the drywell  
12 shell, the most likely cause could be the water  
13 seeping through the inaccessible area.

14 And in slide 10 in your handout, I have a  
15 picture of the drywell shell. It is an inverted light  
16 bulb. That indicates where the inaccessible area  
17 would be.

18 And this area is the area for the distance  
19 between the drywell shell -- did you do slide 10?;  
20 that's a picture there; yes -- where the surrounding  
21 concrete structure is too small for successful  
22 performance of visual inspection. That's the area  
23 right there. The gap is usually two inches, three  
24 inches.

25 CHAIRMAN WALLIS: You used the term

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1 "seeping." It's really any water that gets there from  
2 any reason whatsoever.

3 MS. TRAN: Correct.

4 CHAIRMAN WALLIS: And "seeping" is used as  
5 a general term.

6 MS. TRAN: Term, correct.

7 CHAIRMAN WALLIS: It may not seep. It may  
8 actually flow or --

9 MS. TRAN: Flow through, right.

10 MR. ASHAR: The area that we are  
11 concentrating on is between the shell, between the  
12 shell and the concrete in the back, in between the  
13 insulation --

14 MEMBER BONACA: No, no, no.

15 MR. ASHAR: Oh, I'm sorry. Wrong place.

16 MS. TRAN: Right. That's --

17 MEMBER APOSTOLAKIS: It is between what  
18 and what?

19 MR. ASHAR: Between the freestanding steel  
20 containment --

21 MEMBER BONACA: Between the light bulb and  
22 the --

23 CHAIRMAN WALLIS: There's a space right  
24 there.

25 MR. ASHAR: And mostly it is filled with

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1 insulation.

2 MEMBER APOSTOLAKIS: How does the water  
3 get there?

4 MR. ASHAR: Water gets into -- I'm going  
5 to explain. There are three basic sources of water  
6 that we have seen so far in the operating history.  
7 One can be called because of the -- we don't have any  
8 picture of the actual area.

9 MS. TRAN: No. This is it.

10 MR. ASHAR: This is it. In this area,  
11 there are bellows, bellows between the driver.

12 CHAIRMAN WALLIS: We saw them this  
13 morning.

14 MR. ASHAR: Yesterday you may have seen  
15 it, yes. And those bellows can crack. And then they  
16 can give a seepage into the trough, which collects the  
17 water.

18 Now, if the drain, which is supposed to  
19 drain out all the water from there, is full or is not  
20 working properly, the water can accumulate in the  
21 trough area, which has been kept just for that  
22 purpose. And it may all flow in coming to this area  
23 here.

24 CHAIRMAN WALLIS: It's lower.

25 MR. ASHAR: Because it is not showing

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1 better this particular detail, this is not good  
2 enough. Yesterday it was a very nice picture here.

3 CHAIRMAN WALLIS: But in order to refuel,  
4 you have to flood the upper region there.

5 MR. ASHAR: That is correct.

6 CHAIRMAN WALLIS: And some of that water  
7 can get down on the outside.

8 MEMBER APOSTOLAKIS: Okay. Thank you.

9 MS. TRAN: Now, in this --

10 VICE CHAIRMAN SHACK: Now, is that the  
11 only source of the water, I mean?

12 MR. ASHAR: No, no. There are two or  
13 three we found so far. Okay? One is a cracking of  
14 bellows. Second one is there is a refueling seal  
15 between the bottom of the trough, concrete trough.  
16 And there is a systematic way of draining it out  
17 through a drainage. But drain gets clogged. And the  
18 water comes through that area. It collects in the  
19 trough again and goes into between the concrete and  
20 the drywell shed.

21 Clog one is the reactor cavity wall. You  
22 have a stainless steel liner on it. And stainless  
23 steel liner gets -- they may do for any reason. And  
24 the water goes directly from concrete into that gap in  
25 between the two.

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1                   These are three reasons we have identified  
2                   so far.

3                   CHAIRMAN WALLIS:   So what clogs this  
4                   drain?  You said the drain gets clogged?

5                   MR. ASHAR:  It is because of negligence on  
6                   the part of the various --

7                   CHAIRMAN WALLIS:  Yes.

8                   MR. ASHAR:  -- not to monitor them  
9                   correctly.  Now they have come to their senses.  And  
10                  they started telling us they are monitoring, they are  
11                  doing this, they are doing that.

12                  MEMBER BONACA:  The drains are down from  
13                  the sand cushions, right?

14                  MR. ASHAR:  They are separate.  After the  
15                  water leakage, it is the sand cushion area.  Then  
16                  there are drains to -- actually, those drains were  
17                  meant for making sure the scent does not go away.  And  
18                  if it is, then they can collect them and put them back  
19                  the same.  That was the whole idea behind it.

20                  But it has been used nowadays as a  
21                  water-collecting/catching kind of a thing.  It is an  
22                  indirect function of that particular drain, but that  
23                  shows that water is coming in.  If the drains into  
24                  that room, if it shows any kind of water in the Torus  
25                  room, then it shows that there is a water leakage from

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1 somewhere up above that is getting into that area.

2 CHAIRMAN WALLIS: It drains into the room  
3 around the Torus? It just drips down the wall  
4 somehow?

5 MEMBER SIEBER: Yes.

6 MR. ASHAR: The water comes from here.

7 CHAIRMAN WALLIS: That is a four-inch  
8 drain pipe. It just drains down the wall?

9 MR. ASHAR: This is a sand pocket here.

10 CHAIRMAN WALLIS: Where does it go to when  
11 it drains out of that four-inch drain pipe?

12 MEMBER SIEBER: Onto the floor.

13 CHAIRMAN WALLIS: It just drains onto the  
14 floor?

15 MR. ASHAR: Unless they are collectors.  
16 Some people have started collecting them into some  
17 kind of a jar. But most of them, yes, it was going  
18 onto the floor.

19 MS. TRAN: It goes onto the floor, yes.

20 MR. ASHAR: There is where they find out.

21 MEMBER BONACA: Now, some licensees have  
22 the drainage and some don't. That depends on the --

23 MR. ASHAR: Well, some licensees have  
24 drains of the sand pocket area here.

25 MEMBER BONACA: Down at the low point.

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1 MR. ASHAR: Some people have drains at  
2 this area somewhere on the top of it.

3 MEMBER SIEBER: I think all of them --

4 MR. ASHAR: And if it is on the top of it,  
5 then there has to be sealing between --

6 MEMBER SIEBER: All of them have the top.

7 MR. ASHAR: -- the concrete and the --  
8 yesterday we saw in the Monticello case, it was a  
9 seal, which was a galvanized steel shield between the  
10 sand pocket area and the above area. So it prevents  
11 the water from getting in.

12 MEMBER BONACA: The had a few ounces of  
13 water, too, at some point.

14 MR. ASHAR: Yes, yes.

15 MEMBER BONACA: So they must have come  
16 also from the top.

17 MR. ASHAR: In the case of Monticello,  
18 there were no signs like that. We did not see.

19 MEMBER BONACA: There were only a few  
20 ounces of water, they said.

21 MEMBER MAYNARD: Yes, but they speculated  
22 that that water had actually come from another source  
23 because of the two or three-inch sand pipe there.

24 MEMBER BONACA: On the sand pipe there,  
25 yes.

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1 MR. ASHAR: They could explain when you  
2 ask that question.

3 CHAIRMAN WALLIS: Well, if it drains down  
4 that four-inch drain pipe, I would assume that the  
5 sand is full of water.

6 MEMBER SIEBER: Yes.

7 MEMBER MAYNARD: Right. That is not the  
8 low point.

9 CHAIRMAN WALLIS: There is a lot of water  
10 there before it drains down the pipe. The sand  
11 pocket, the sand --

12 MR. ASHAR: The sand pocket has to be  
13 sucked up completely.

14 CHAIRMAN WALLIS: The sand cushion is  
15 saturated with water first.

16 MR. ASHAR: Right.

17 MEMBER SIEBER: A number of plants have  
18 drains at the bottom of the sand --

19 MR. ASHAR: At the bottom --

20 MEMBER SIEBER: It would make more sense  
21 to --

22 MR. ASHAR: Some people have at the bottom  
23 of the sand pocket area drains with -- again,  
24 actually, it is to retain the sand inside. So that  
25 all flowing sand can be collected, but if they can use

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1 it at the --

2 MEMBER SIEBER: What is the purpose of the  
3 sand in the first place?

4 MR. ASHAR: Okay. See, this is the --

5 MEMBER SIEBER: Got a cushion?

6 MR. ASHAR: -- concrete area -- okay? --  
7 here. And this one when the shell expands under  
8 pressure --

9 MEMBER SIEBER: It is room to --

10 MR. ASHAR: -- it gives you some room to  
11 budge in.

12 MEMBER SIEBER: Expand? Okay. But the  
13 whole bottom of the shell sits on concrete? So you  
14 don't worry about corrosion below the sand?

15 MR. ASHAR: We do in some cases. We do to  
16 some extent, yes. If --

17 MEMBER SIEBER: How do you address that?  
18 You can't get to it because the top of it is concrete,  
19 too.

20 MR. ASHAR: If there is an appreciable  
21 collection of water in the sand bucket area, there is  
22 a chance that the water might have gone between the  
23 steel shell and the concrete.

24 MEMBER SIEBER: Right.

25 MR. ASHAR: But those cases, we have not

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1 found many so far except one, one case.

2 MEMBER SIEBER: You probably don't know --

3 MR. ASHAR: Yes, sir.

4 MEMBER SIEBER: -- you've got a concrete  
5 pad, a hemispherical pad, and then concrete above  
6 that.

7 MR. ASHAR: Right.

8 MEMBER SIEBER: And so there's no way to  
9 make a measurement.

10 MR. ASHAR: We know.

11 MS. TRAN: The interior.

12 MEMBER SIEBER: You can't get to the  
13 inside unless you cut the concrete out.

14 MR. ASHAR: Unless you cut the concrete or  
15 there are some new methods that have been developed in  
16 the NRC's research program, which have guided matters,  
17 but they are not yet being calibrated and haven't been  
18 used extensively by anybody.

19 So there are potential uses for those  
20 things under these examinations, but we have not seen  
21 them use it so far. We have just put one report from  
22 Oak Ridge National Lab in e-mail items so that people  
23 can look at that report and see if it is applicable  
24 for them.

25 CHAIRMAN WALLIS: Didn't someone yesterday

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1 say they actually made holes in that concrete in order  
2 to inspect?

3 MR. ASHAR: Yes.

4 MS. TRAN: Monticello.

5 MEMBER SIEBER: Next to the pedestal.

6 MR. ASHAR: Yes. They had to do that.

7 MEMBER SIEBER: But that is about as far  
8 as you can go because --

9 MR. ASHAR: That is as far as you can go  
10 right now, right.

11 MEMBER SIEBER: It's really thick in  
12 between.

13 MR. ASHAR: Yes. You can go up to here in  
14 the sand pocket area. Anything below that, if there  
15 is a --

16 MEMBER SIEBER: Of course, the sump is in  
17 there, too.

18 VICE CHAIRMAN SHACK: But typically,  
19 though, I mean, your experience is that there is no  
20 water there or that they all collect water?

21 MR. ASHAR: Typically the water has been  
22 very little. There has been water except in one case  
23 in the case of, I think it is, Dresden III, when they  
24 had to put firewater in here to extinguish a fire in  
25 the gravel area here --

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1 VICE CHAIRMAN SHACK: Well, that would do  
2 it.

3 MR. ASHAR: -- because of a summation  
4 fire. I don't know why.

5 MEMBER SIEBER: Good place to get a fire.

6 MR. ASHAR: But there was a fire there.  
7 They put a lot of water into it. And this whole area  
8 becomes soft here in the sand --

9 CHAIRMAN WALLIS: I'm interested to see  
10 when the sand gets full of water by some mechanism how  
11 it ever gets out. How does it ever get dry?

12 MR. ASHAR: With sand you --

13 CHAIRMAN WALLIS: If you had water access,  
14 suppose the bellows fails --

15 MR. ASHAR: Except the temperature --

16 CHAIRMAN WALLIS: -- water runs down.

17 MEMBER SIEBER: Aren't there drains at the  
18 bottom of this thing pushing it, right?

19 MR. ASHAR: Some have. This one is not  
20 shown here. There is a drain right here.

21 CHAIRMAN WALLIS: There is a drain there?

22 MR. ASHAR: There is a drain.

23 MEMBER SIEBER: Okay.

24 CHAIRMAN WALLIS: So that is how you draw  
25 out the sand? You just let it soak out?

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1 MEMBER SIEBER: It drips into where the --

2 MR. ASHAR: The temperature in the drywell  
3 in general in that area is close to about 130-140  
4 degrees. So it helps a little bit drying --

5 CHAIRMAN WALLIS: It evaporates the water?

6 MR. ASHAR: To some extent, not -- I mean,  
7 I have been given those explanations by various  
8 applicants, I know, what does this, but I do not  
9 believe everything they say. But --

10 CHAIRMAN WALLIS: Okay.

11 MS. TRAN: Slide five, please.

12 MEMBER SIEBER: You say the space between  
13 the concrete and the shell and the drywell is filled  
14 with insulation.

15 MR. ASHAR: Yes, there is insulation in  
16 there.

17 MEMBER SIEBER: What is it, some kind of  
18 fiber of some sort?

19 MR. ASHAR: I think so, yes. In one case  
20 we found that insulation was bad enough that it has  
21 chloride and all those contaminants. So when the  
22 water came in, it came with contaminated water. And  
23 that started accelerating the corrosion rate.

24 MEMBER SIEBER: That would do it. The  
25 insulation holds the water all up and down.

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1 MR. ASHAR: Up and down.

2 MR. GILLESPIE: Hans, I think it is  
3 important here that we're not talking in every case  
4 about any single containment.

5 MR. ASHAR: Right.

6 MR. GILLESPIE: What you have hit on is  
7 exactly what I tried to say in the beginning. The  
8 specific designs are so variant that we have really  
9 found out in doing these reviews that a Mark I  
10 containment is not a Mark I containment when you're  
11 looking at the drain details and the drain location.  
12 It's a function of the age, the AE. And, for example,  
13 Nine Mile actually put cameras up to ten-inch drains  
14 that they have and looked up in there, and it was  
15 dust.

16 And so before we assume that this thing is  
17 always full of water on everyone, there is a great  
18 variance between each unit. The design is different.  
19 And what licensees have done in the past to verify  
20 either the presence or absence of water is very  
21 different.

22 And so it's not like there is a universal  
23 answer to each one of these. Each one really is  
24 different.

25 VICE CHAIRMAN SHACK: Now, again, just on

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1 that, are all of the ones filled with insulation or  
2 are some of them actually air gaps?

3 MEMBER ARMIJO: I thought Monticello was  
4 an air gap based on yesterday's presentation.

5 MR. ASHAR: It is called air gap. I mean,  
6 in general, the terminology used is air gap.

7 VICE CHAIRMAN SHACK: But, I mean, is it  
8 typically filled with insulation?

9 MR. ASHAR: Typically it is a concrete  
10 General Electric design. It has the insulation in  
11 most cases. There might be a plant or two that may  
12 not have it available, but there might be some plants.

13 MEMBER SIEBER: You almost need it to be  
14 the form for pouring the concrete.

15 MR. ASHAR: Right, exactly.

16 MEMBER SIEBER: You need something in  
17 there to do that. Otherwise you don't have a gap at  
18 all. And one of the ways you get water down there is  
19 you have to take that refueling seal out after you  
20 refuel in order to put the drywell back together. And  
21 the process of doing that leaves a lip of water --

22 MR. ASHAR: Right.

23 MEMBER SIEBER: -- all around where the  
24 seal --

25 MR. ASHAR: Right.

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1 MEMBER SIEBER: -- used to be. It can  
2 only go down.

3 CHAIRMAN WALLIS: Now, we had a plant  
4 recently which had bulges in this realignment.

5 MR. ASHAR: I want to clarify two things.  
6 Okay?

7 CHAIRMAN WALLIS: It was Brunswick.

8 MR. ASHAR: There is a problem with the  
9 terminology. The first thing, when we talk about the  
10 drywell shell, it is a freestanding drywell steel  
11 shell. And when we talk about the liner, it is  
12 attached to concrete with some kind of anchorages.

13 And that is where we use the word "liner."  
14 But I have seen people using very loosely "drywell  
15 liner" here. It is not true. Okay? We are going to  
16 clarify the terminology in the next -- there is no --

17 MEMBER SIEBER: The one plant that has the  
18 liner, the shell, the structural member is the  
19 concrete, the subject of the code.

20 CHAIRMAN WALLIS: Yes, that's right.

21 MEMBER SIEBER: So you can tolerate some  
22 amount of corrosion as long as you --

23 CHAIRMAN WALLIS: So the liner just sits  
24 on the --

25 MEMBER SIEBER: -- maintain tightness.

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1 CHAIRMAN WALLIS: Okay. So the liner sits  
2 on the concrete, which is why it bulges.

3 MEMBER SIEBER: Just in that one plant.

4 CHAIRMAN WALLIS: This one is  
5 freestanding, this one.

6 MEMBER SIEBER: Yes.

7 MR. ASHAR: The one we are showing is a  
8 freestanding shell plus the liner.

9 MS. TRAN: Okay. Slide five. For some  
10 applications, just the information provided was  
11 included in the various sections of the LRA. And for  
12 other applications, the information was obtained to  
13 request for additional information.

14 As a result, the proposed ISG recommended  
15 that future applicants provide a plant-specific aging  
16 management program that would address the loss of  
17 material for the accessible area of the drywell shell.

18 So the recommendations that the applicant  
19 should be included in there, in the aging management  
20 program to develop a corrosion rate that is really  
21 inferred from past UT examination or establish a  
22 corrosion rate using representative samples in similar  
23 operating condition.

24 CHAIRMAN WALLIS: I would think the  
25 corrosion rate was so low that it would be difficult

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1 to measure. Really, you could say that it's less than  
2 a certain amount.

3 MS. TRAN: Less than, then. No minimum  
4 design.

5 CHAIRMAN WALLIS: That's good enough. You  
6 don't actually want them to determine what it is  
7 because you might be so low that you can't measure it.  
8 But if it's less than a certain amount, that would be  
9 acceptable, wouldn't it?

10 MR. ASHAR: In general, subsection IWE of  
11 the ASME code allows close to about ten percent  
12 allowance --

13 CHAIRMAN WALLIS: I know, but --

14 MR. ASHAR: -- some localized corrosion.

15 CHAIRMAN WALLIS: But if there is no water  
16 there, the corrosion rate may be essentially zero.

17 MS. TRAN: Correct.

18 CHAIRMAN WALLIS: And so establishing a  
19 zero thing is very difficult to do.

20 MEMBER SIEBER: Really, what you are  
21 trying to do is to determine how close you are to  
22 min wall.

23 MR. ASHAR: The min wall, right, minimum  
24 wall.

25 MEMBER SIEBER: And by plotting the

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1 reduction in thickness, you can determine when you are  
2 going to hit min wall. At that point you no longer  
3 meet the code for that pressure vessel.

4 VICE CHAIRMAN SHACK: How do I do this?  
5 Do I have to have multiple UT readings from that  
6 inaccessible portion of the shell? Can I demonstrate  
7 that mine is always dry?

8 MEMBER MAYNARD: You could develop a way  
9 that you had data from the --

10 MR. ASHAR: Two in the same location.

11 MEMBER MAYNARD: If an applicant comes in  
12 and they don't have previous data, I'm not sure how  
13 they develop a rate.

14 MS. TRAN: This is what we learned in  
15 putting this together. They will have one point at  
16 the beginning, you know, the design of the fabrication  
17 point. And then as a result of generic letter 87-05,  
18 most applicants, I mean, yes, have another data point.  
19 So when using that, they could develop some kind of --

20 VICE CHAIRMAN SHACK: Again, that is very  
21 specific. How many data points did they take when  
22 they made those UT measurements? How many locations?

23 MS. TRAN: Eighty-seven? Do you know?

24 MR. ASHAR: Yes. Generally in response to  
25 87-05, a number of -- now I have to say licensees, not

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1 applicants -- licensees have taken that kind of  
2 approach that they will look at four points in four  
3 sectors --

4 VICE CHAIRMAN SHACK: Four quadrants.

5 MR. ASHAR: -- because they don't remove  
6 the sand. They just have the sand. It's not like  
7 Oyster Creek. So what they do is they chip out the  
8 concrete in certain areas and then take the  
9 measurements and in response to 87-05.

10 And the second reading they take is two  
11 years or so after. That gives them a closer rate at  
12 the same location. It isn't delicate science that,  
13 hey, something is going on. Then they do more work.

14 VICE CHAIRMAN SHACK: Now, again, from  
15 Monticello, they don't seem to have maintained those  
16 as access ports.

17 MEMBER SIEBER: No.

18 MR. ASHAR: No, they don't. I mean, they  
19 can get to it if they have to, but they don't maintain  
20 them because they --

21 MEMBER SIEBER: That becomes another  
22 pocket for corrosion --

23 MR. ASHAR: Yes, right. It becomes --

24 MEMBER SIEBER: -- because there is  
25 moisture inside the containment.

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1 MR. ASHAR: Right.

2 MEMBER SIEBER: In the sump is actually  
3 that floor there. The sump is built into the floor.  
4 And so every loose water, amount of water, ends up in  
5 that space where the drywell liner and the concrete  
6 meet.

7 So they have to fill it up. They have to  
8 do something. Otherwise you would have a pocket of  
9 water sitting there.

10 CHAIRMAN WALLIS: I am still a little  
11 puzzled. I would think that the corrosion rate is so  
12 low that it's within the uncertainty in the ultrasound  
13 measurements.

14 MR. ASHAR: If it is low, they will report  
15 as low.

16 MS. TRAN: At least we will have --

17 MEMBER SIEBER: Carbon steel water and --

18 CHAIRMAN WALLIS: There's no water there.

19 MR. GILLESPIE: As it happens with real  
20 applicants, we're looking at corrosion rates like 17,  
21 18 ml a year in some cases.

22 CHAIRMAN WALLIS: There is water there.

23 MR. GILLESPIE: Well, yes. And people are  
24 seeing some evidence of corrosion. In another case,  
25 Nine Mile case, they did these measurements. And then

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1 they have a high-corrosion area on mild carbon steel  
2 at the water line in the Torus.

3 And what they did was they took that rate  
4 as a conservative estimate, where they know water is,  
5 and applied it to their liner and say, "Okay. We've  
6 got 38 years to go here."

7 And so people actually have come up with  
8 ways given these points and other representative  
9 carbon steel areas within their area that they do  
10 measure because they're in harsher environments and  
11 applied that as a representation to this in order to  
12 show that they could make it past the renewal period  
13 or at least until the next measurement that they might  
14 commit to take.

15 And so so far each licensee that we have  
16 had an opportunity to both finish our review or  
17 interface with so far has actually been extremely  
18 consistent with this position. And so they have  
19 actually figured out how to do it.

20 And there is other carbon steel in the  
21 Torus, actually in a wet environment, which gives you  
22 a noticeable rate, as it happens, particularly where  
23 some of the liners have blistered and bubbled, which  
24 is a whole other issue, that they can apply to this.

25 It's a conservative application. You

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1 know, if it doesn't work, then they have to do  
2 something else to convince us that the rate is okay.

3 So when we talk the nebulous philosophy,  
4 it gets harder, but I think when you get to specific  
5 plant situations, pardon the pun, but it's concrete.  
6 And so they have kind of come up with ways to use the  
7 generic point, the generic letter issue points.

8 In fact, in Vermont Yankee's case, they  
9 actually had leakage and did extra measurements  
10 consistent with the ISP, which wasn't issued when they  
11 did this some years ago. And so they have preserved  
12 those extra points.

13 And so it just happens that these plants  
14 actually have this information sitting there. They  
15 just haven't used it in this application before. And  
16 this is clarifying. We expect you to use it in this  
17 application.

18 Go ahead, Linh.

19 MS. TRAN: I guess now where degradation  
20 has been identified in accessible area of the drywell,  
21 meaning in the interior area of the drywell, the  
22 applicant should provide an evaluation that would  
23 address the condition of the inaccessible area of a  
24 similar condition or find something in the interior  
25 area. They should have an evaluation for that.

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1 Now, to assure --

2 MEMBER APOSTOLAKIS: How does one do that?

3 MR. ASHAR: Let me. The actual, this is  
4 just what we have seen.

5 MEMBER APOSTOLAKIS: That's okay. You  
6 don't have to show it.

7 MR. ASHAR: Okay. This is the requirement  
8 we set in after when we endorsed IWE, IWL into  
9 50.55(a) in the rule, that if they find something in  
10 the accessible area, they ought to go and look in the  
11 surrounding inaccessible area to see if there is  
12 anything going on.

13 A lot of PWR licensees, for example, have  
14 found that at the junction of the steel liner of the  
15 concrete containment and the concrete floor, they have  
16 moisture barriers generally. And their moisture  
17 barrier gets damaged. The borated water many times go  
18 in. And it starts corroding the inside area. It  
19 shows up a little bit on the upper side.

20 So they would do examination and find out  
21 what is going on. And they find the moisture barrier  
22 could be the culprit. They have to change the  
23 culprit. They ought to go inside. They ought to take  
24 out the corrosion.

25 So that's the reason this problem has been

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1 in about the inaccessible. In accessible area you  
2 have corrosion. You would look into the joining  
3 inaccessible area to find every --

4 MEMBER APOSTOLAKIS: You will look into  
5 the inaccessible area. That helps make it accessible  
6 or not?

7 MR. ASHAR: No. If you see some rusting  
8 or something on the --

9 MEMBER APOSTOLAKIS: You can look at it.  
10 Why isn't it accessible?

11 MR. ASHAR: No, no. The whole area is  
12 that you see something in an accessible area. And  
13 they investigate as to what is going on underneath  
14 that particular area. The basic focus in the room was  
15 the PWR containments. That is where it was found in  
16 so many of them. And still we are finding it.

17 MEMBER ARMIJO: But it is possible you  
18 could have damage occurring in an inaccessible area  
19 and have nothing in the accessible.

20 MR. ASHAR: That's quite right.

21 MEMBER SIEBER: Possible.

22 MR. ASHAR: That is why this type of --

23 MEMBER ARMIJO: Very possible. I mean,  
24 it's --

25 MS. TRAN: That is why we use accessible

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1 area as the indication for the accessible area for the  
2 augmented inspection. They have to do visual in the  
3 surface. And then if the surface area is accessible  
4 only from one side and they have to protect the wall  
5 thing by using ultrasonic --

6 MEMBER ARMIJO: I don't worry about the  
7 accessible. I just worry about the inaccessible and  
8 having no way of knowing just by looking at the  
9 accessible area. It's not a good --

10 MR. ASHAR: That is where this ISG kicks  
11 in because this ISG is focused on inaccessible area.  
12 This is one of the pointers, that if there is  
13 something going on in the accessible area, which you  
14 can see right away, then there is something going on  
15 and you will look at it.

16 MEMBER ARMIJO: That is the easy part.

17 MR. ASHAR: The ISG concentration, focus  
18 of this ISG, is the inaccessible areas.

19 MEMBER APOSTOLAKIS: But how does one  
20 suspect?

21 CHAIRMAN WALLIS: Yes, that's right. How  
22 does one suspect?

23 MEMBER APOSTOLAKIS: How do you suspect?

24 MS. TRAN: You find water or leakage on  
25 your --

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1                   MEMBER APOSTOLAKIS: That is getting back  
2 to what Dr. Armijo is saying. That's not our worry.  
3 What if you don't find water? You still make some  
4 problem in the inaccessible area. Is that correct?

5                   MEMBER ARMIJO: Yes, you could.

6                   MEMBER APOSTOLAKIS: So how does one  
7 suspect that something is going on in the inaccessible  
8 area?

9                   MEMBER BONACA: No. She says water.

10                  MS. TRAN: Water is one. If you find  
11 water in the drain lines, water in the drain line, in  
12 the --

13                  MEMBER BONACA: For example, if the seals  
14 -- I guess you are focusing on the seals and on the  
15 bellows, right?

16                  MR. ASHAR: Right.

17                  MEMBER SIEBER: The only way you can get  
18 water into the inaccessible area is to have it flow  
19 through the accessible area. So if you make a  
20 measurement in the accessible area --

21                  MEMBER APOSTOLAKIS: Okay. That is a  
22 different --

23                  MEMBER SIEBER: -- that gives you some  
24 kind of justification to extrapolate to the area you  
25 get.

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1 MEMBER APOSTOLAKIS: But that doesn't help  
2 much because it could have run down --

3 VICE CHAIRMAN SHACK: The water runs down  
4 and collects at the --

5 MEMBER SIEBER: Right.

6 VICE CHAIRMAN SHACK: It doesn't stay on  
7 the side of the --

8 MEMBER BONACA: That is why the real focus  
9 is the last bullet. And that's what they attempted to  
10 do, you know, to put in the seals and the bellows in  
11 the scope of license renewal. And this has been kind  
12 of debated with the industry.

13 CHAIRMAN WALLIS: This is a very weak  
14 statement, "if moisture is suspected." That's a very  
15 subjective --

16 MS. TRAN: Or detected.

17 CHAIRMAN WALLIS: If you have a suspicious  
18 nature, you would suspect it all the time.

19 MR. ASHAR: Subsection IWE in its  
20 IWE-1240, there's a number of items. This is the  
21 abbreviated form. A number of places where this could  
22 occur is very vividly described in there, IWE-1240 in  
23 the ASME code. And that is what we are invoking, but  
24 we did not write everything that is written in the  
25 IWE-1240.

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1 MEMBER APOSTOLAKIS: Now, you are really  
2 including SSCs that are identified as source of  
3 moisture and scope, source of moisture?

4 MR. ASHAR: Yes. For example, cracking of  
5 bellows.

6 MEMBER SIEBER: The refueling seal.

7 MR. ASHAR: I explained to you earlier.

8 MEMBER APOSTOLAKIS: Okay. That's what --

9 MS. TRAN: The refueling seal is not.

10 MR. ASHAR: Refueling seal.

11 MS. TRAN: So they have to put that in the  
12 scope of license renewal.

13 MR. ASHAR: This is what we are --

14 MEMBER APOSTOLAKIS: Okay.

15 CHAIRMAN WALLIS: Why don't they just  
16 require that they check the bellows for cracks  
17 routinely?

18 MR. ASHAR: It is not very easy to get to  
19 it. They can do tests. That's what they do most --

20 MEMBER SIEBER: It not the only place it  
21 can leak.

22 MR. ASHAR: Yes. And I say --

23 MEMBER SIEBER: They can leak along the  
24 edge.

25 MR. ASHAR: Yes. And this is what we want

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1 to have them in the scope of license renewal, so they  
2 maintain them in a condition where it is not leaking.

3 MEMBER MAYNARD: Well, by "suspected"  
4 here, don't you really mean if there has been some  
5 previous evidence that moisture has been there? You  
6 know, I suspect. I have a hard time dealing with what  
7 I might suspect, but I can deal with whether I have  
8 had any indications or evidence.

9 MS. TRAN: Yes. This is "suspect" or  
10 "detected" through your drain lines.

11 CHAIRMAN WALLIS: Well, if moisture is  
12 detected, now, that makes sense.

13 MEMBER MAYNARD: Yes.

14 MS. TRAN: It should be "detected,"  
15 instead of "suspected."

16 VICE CHAIRMAN SHACK: So if moisture has  
17 been detected any time in the life of this plant up  
18 until license renewal included? Is that what it says?

19 MEMBER APOSTOLAKIS: It is not really  
20 detected. Go ahead. You answered my question.

21 CHAIRMAN WALLIS: Well, just take out the  
22 "if" clause and say, "include."

23 VICE CHAIRMAN SHACK: Yes. Why not just  
24 include them?

25 MEMBER APOSTOLAKIS: I think "suspected"

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1 is broader because would that include a situation  
2 where you have seen moisture or water in a similar  
3 facility and you suspect it may happen in yours, even  
4 though you hadn't seen it? "Suspected" is broader.

5 MEMBER MAYNARD: Well, yes, but I think  
6 from a regulatory standpoint and from dealing with  
7 licensees, I think you need a little bit better  
8 definition rather than it just being somebody's  
9 opinion sitting there saying, "Well, I suspect there  
10 might be something there."

11 CHAIRMAN WALLIS: Suspected by whom?  
12 Inspector or is it --

13 MEMBER MAYNARD: Well, I like the  
14 "detected" or --

15 MS. TRAN: Detected. I think --

16 MEMBER BONACA: We had a discussion  
17 yesterday at Monticello that shows how difficult the  
18 issue is. I mean, we rely very much on subjective  
19 judgments and say, "Well, we don't think we ever had  
20 water."

21 CHAIRMAN WALLIS: You could simply say  
22 that "The ACRS suspects that there may always be water  
23 there. Therefore."

24 MEMBER APOSTOLAKIS: You guys must have  
25 had a hell of a meeting yesterday.

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1 VICE CHAIRMAN SHACK: In Monticello's  
2 case, they see no evidence of corrosion in '87, which  
3 was a fairly substantial operating period for them.

4 MEMBER APOSTOLAKIS: That's right.

5 MS. TRAN: Identified.

6 MEMBER ARMIJO: If they have good records,  
7 they have a good sound --

8 VICE CHAIRMAN SHACK: One data point.

9 MR. ASHAR: We have to draw things --

10 MEMBER ARMIJO: They don't have to do it.

11 MS. TRAN: So just to get back on --

12 CHAIRMAN WALLIS: You really fixed this  
13 up.

14 VICE CHAIRMAN SHACK: Why not just put  
15 these seals in scope and be done with it?

16 MR. ASHAR: This is what we tried to do  
17 earlier. And there is so much resistance from a  
18 number of applicants. I mean, I had to go to three or  
19 four RAIs over and above a lot of teleconferences to  
20 convince them to put this in the scope of license  
21 renewal. And so many people denied.

22 CHAIRMAN WALLIS: So now you have to  
23 convince them to suspect something?

24 MR. ASHAR: No. Now, with this ISG, if  
25 they have suspected sites, areas, then --

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1 CHAIRMAN WALLIS: But they don't want to  
2 do it anyway. They'll never suspect anything.

3 MEMBER APOSTOLAKIS: No. Presumably there  
4 will be some guidance what suspicion means.

5 MR. ASHAR: There is a guidance.

6 MEMBER APOSTOLAKIS: Yes.

7 MR. ASHAR: There is.

8 CHAIRMAN WALLIS: There must be.

9 MEMBER APOSTOLAKIS: It just doesn't say  
10 it in bullets.

11 MS. TRAN: Yes.

12 MR. ASHAR: I was looking for IWE-1240  
13 here. I don't have one.

14 CHAIRMAN WALLIS: Okay.

15 MR. ASHAR: But that is where it is fully  
16 described as to -- this is what we are invoking here  
17 basically.

18 CHAIRMAN WALLIS: You want to say  
19 something, "if there are indications of moisture" or  
20 something like that.

21 MR. KUO: If I may, Part 54 rule in the  
22 rule language in the SOC discussed this, saying if a  
23 component is in an environment that could have aging  
24 effect, say in the operating experience, anywhere in  
25 the industry or your specific plant, that there is

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1 such a degradation mechanism, degradation mechanism  
2 that could cause an aging effect, then an aging  
3 management program should be provided. That's what  
4 the Part 54 rule requires.

5 In other words, if this is a possible  
6 aging effect from the operating experience, then that  
7 is suspected. You would use the word "suspect." That  
8 happened before. We should not talk about the  
9 hypothetical aging effect, but it is an aging effect  
10 that we have seen before.

11 VICE CHAIRMAN SHACK: Right. That is why  
12 I can't understand why you can't just put the seals in  
13 scope. I mean, it's not a hypothetical event.

14 MR. KUO: Like Hans said, some people  
15 don't want to include the seal in the scope.

16 CHAIRMAN WALLIS: There are often people  
17 who don't want to do things, but you can say, "Do it."

18 MEMBER BONACA: What you want and what you  
19 get are two different things.

20 MR. GILLESPIE: I think you will find as  
21 a result of this ISG, fundamentally seals are in  
22 scope. Remember, seals and the refueling stuff are  
23 not safety basically. And so what we're doing is  
24 because of the effect of non-safety components on a  
25 safety component, we're bringing them into scope. So

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1 it's a bit indirect.

2 And so it shouldn't be a surprise that  
3 utilities don't want extra requirement on things that  
4 don't have any requirements on them now.

5 MEMBER BONACA: But, you know, one thing  
6 that we are learning from this license renewal process  
7 as we converge, it seems to me that the central issues  
8 are becoming the inaccessible or buried components  
9 that you can't look at, that you cannot measure. And  
10 that's natural because, I mean, these plants are going  
11 beyond some original design in certain components of  
12 the -- and I think that it is important that we focus  
13 on these inaccessible components and ask our  
14 questions, you know, how long can this live and what  
15 is the source of the problem. And here -- anyway --

16 MS. TRAN: Hans wanted me to read the  
17 IWE-1241, the examination surfaces, "Surface area for  
18 the typical location," "Typical location of such areas  
19 of those exposed to stand-in water, repeated wetting  
20 and drying, persistent leakage, and those with  
21 geometries that permit water accumulations,  
22 condensation, and biologicals attack." I mean, it is  
23 in the -- it tells the applicant the area.

24 Now, let's say if moisture is detected as  
25 suspected or identified --

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1 (Laughter.)

2 MS. TRAN: Now, we will agree that they  
3 found water. Okay? So they should include the  
4 component, the source of it, in the scope of license  
5 renewal. In addition, we need to identify the surface  
6 area.

7 Next slide. By implementing and  
8 augmenting inspection for the period of extended  
9 operation in accordance with the ASME section 11,  
10 subsection IWE and also for the examination shall be  
11 in accordance with section 11, subsection IWE-2500.  
12 And I did go over that a little bit earlier.

13 That means that surface area accessible  
14 from both sides should be visually examined and  
15 surface area that is only accessible from one side  
16 should be examined for wall thinning and using sonic  
17 thickness measurement method.

18 Now, after all of that, after all of the  
19 augmented inspection, the applicant should demonstrate  
20 that either corrosion is not occurring by performing  
21 those examinations or analysis to do analysis on the  
22 result or that corrosion is progressing so slowly that  
23 the age-related degradation will not jeopardize the  
24 intended function of the drywell to the period of  
25 extended operation.

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1 VICE CHAIRMAN SHACK: Just how thick is  
2 this light bulb again?

3 MR. ASHAR: The light bulb? It varies.  
4 From the top, it is thinner, very thin, right around  
5 half-inch to three-quarter-inch. As you go down near  
6 the knuckle area between the sphere and the upper  
7 part, it is spherical area. It is close to about .7,  
8 .6 inches. Then it again goes down up to six inches.  
9 And then at the bottom area is about one to one and a  
10 half inches in between the sand pocket area --

11 VICE CHAIRMAN SHACK: No. But, I mean,  
12 it's 17 ml a year.

13 MR. ASHAR: Oh, yes.

14 VICE CHAIRMAN SHACK: You're going to chew  
15 that at a pretty good clip.

16 MEMBER BONACA: If you find a hole in the  
17 liner, I mean, would you suspect some moisture there?  
18 I mean, what is --

19 CHAIRMAN WALLIS: Even my chassis of my  
20 car, which is soaked in salt, doesn't corrode at 17 ml  
21 per year, does it? It's really bad conditions if  
22 you've got --

23 MR. GILLESPIE: Yes. That actually is the  
24 two worst points that a particular --

25 CHAIRMAN WALLIS: Yes, very bad --

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1 MR. GILLESPIE: -- that they reported to  
2 us. What it does do, though, is say there is  
3 operating history out there in this utility  
4 environment, that we cannot take for granted that it  
5 can't happen.

6 CHAIRMAN WALLIS: Right.

7 MR. GILLESPIE: And that's the reason for  
8 the ISG. We are not going to make the assumption  
9 because we have operating history that says it's not  
10 necessarily a valid assumption in all cases that it's  
11 going to go slow. There has been evidence of this  
12 going faster than people would have originally  
13 anticipated in the designs.

14 MEMBER BONACA: But in some cases where we  
15 have questioned the bellows, particularly the seals,  
16 if you're in seals, then the answer is always, well,  
17 we have good drainage. So you are in a quandary. I  
18 mean, what leads you --

19 MR. ASHAR: There are a number of things  
20 that tells us. The first thing, the drains are not  
21 clogged any time in the past. The second thing,  
22 visual examinations performed in the areas, it was  
23 shown there are no telltale signs of water for a  
24 number of inspections there performed. Then they had  
25 to show us at the bottom in the drain line there was

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1 no water coming out anywhere.

2 So there are so many things that they  
3 would tell us before they convince us that there is  
4 nothing going on.

5 MR. GILLESPIE: Mario, I would also say  
6 that I think this came up in Monticello's case  
7 yesterday, --

8 MR. ASHAR: Right.

9 MR. GILLESPIE: -- where they didn't take  
10 credit for it, but they actually had a primer sprayed  
11 on the outside of the inaccessible area. And other  
12 licensees have different applications of codings on it  
13 also.

14 And so it's not one thing.

15 MEMBER BONACA: Yes, I know, but --

16 MR. GILLESPIE: Aging management is  
17 accumulation of codings, time of exposure, amount of  
18 water.

19 MEMBER BONACA: And the spray on the  
20 surface was 65 or 40 years ago practically, 1965. So,  
21 you know, right. I understand.

22 MR. GILLESPIE: But the environment is not  
23 such that there is anything in there to actually cause  
24 the paint to peel off either. So there's no one issue  
25 here.

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1 MEMBER BONACA: Yes. I understand.

2 MR. GILLESPIE: It's different pieces to  
3 try to give you reasonable assurance.

4 MEMBER BONACA: In fact, yesterday at the  
5 end of the conversation, it was the lady who was  
6 performing the inspections felt confident with that.  
7 I'm sure that if you go physically and look at it and  
8 get information, you know, you can build a credible  
9 case that there is no concern with moisture. So I  
10 accepted that yesterday.

11 MEMBER ARMIJO: But a case has to be made  
12 --

13 MEMBER BONACA: Yes, it does.

14 MEMBER ARMIJO: -- with documented data,  
15 not just --

16 MEMBER BONACA: Right.

17 MEMBER MAYNARD: Is there something that  
18 is done periodically to ensure that these drains are  
19 really open, like particularly the sand point drains  
20 and stuff, that they're not plugged in some way?

21 MR. ASHAR: Now they are committing to  
22 those things. They have ensured those things, yes.

23 VICE CHAIRMAN SHACK: You'll find out when  
24 you have a leak.

25 MEMBER SIEBER: A sand pocket drain is a

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1 four-inch pipe. So they're hard to plug.

2 VICE CHAIRMAN SHACK: Yes.

3 MEMBER BONACA: I believe we have also  
4 some comments from the industry.

5 MS. TRAN: Right. Yes.

6 MEMBER BONACA: So shortly we'll get to  
7 those.

8 MS. TRAN: I am almost done. Now, if the  
9 intended function of the drywell cannot be met, the  
10 applicant can identify actions that will be taken as  
11 part of the aging management program to ensure that  
12 the integrity of the drywell would be maintained  
13 through the period of extended operation.

14 Last slide. Now, the drywell shell  
15 concern has already been addressed for the reactor's  
16 initial 40 years' licenses and relevant plants that  
17 have received a renewal license, as indicated in the  
18 left column there.

19 Now, the staff is in the process of  
20 reviewing the plants in the middle column. And the  
21 third column represented the remainder of the plants  
22 with the Mark I steel containment design.

23 Not all the plants in the third column,  
24 however, have announced their intention to renew their  
25 license, but the future review that's listed on the

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1 right side.

2 This concludes my presentation. So we can  
3 entertain any additional questions that you might  
4 have.

5 MEMBER BONACA: You don't have to request  
6 questions.

7 CHAIRMAN WALLIS: Ell, I suspect there  
8 might be some more questions.

9 (Laughter.)

10 MEMBER SIEBER: I don't know what they  
11 would be that we haven't already asked.

12 MEMBER BONACA: Any additional questions?

13 (No response.)

14 MEMBER BONACA: None. So we thank you for  
15 a very good presentation.

16 MS. TRAN: Thank you.

17 CHAIRMAN WALLIS: You have been here all  
18 day, Alex.

19 MR. MARRION: I know. Can I get one of  
20 those little name tag things? I'll just put it on.

21 (Laughter.)

22 MR. MARRION: Good afternoon. My name is  
23 Alex Marrion. I'm Senior Director of Engineering with  
24 NEI. And with me I have James Ross, who is the senior  
25 project manager with lead responsibility for license

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1 renewal. He's here to keep me out of trouble. He  
2 should have been here earlier.

3 I just want to make a couple of general  
4 comments. Based upon comments that the NRC made about  
5 the uniqueness of the specific plant designs, we feel  
6 that this is not really a generic issue, but it's  
7 appropriate to address it on a plant-specific basis in  
8 accordance with the uniqueness of the designs. And I  
9 think Frank Gillespie brought that up.

10 This is not a new issue. It's been  
11 addressed by the licensees in the past. There was a  
12 generic letter, 8705. And inspection requirements  
13 were incorporated into NRC regulations when NRC  
14 endorsed the ASME code subsection IWE as part of an  
15 update of 10 CFR 50.55(a).

16 Because that was already regulatory  
17 requirements, utilities were resisting the idea of  
18 imposing an additional regulatory requirement given  
19 that there wasn't sufficient evidence to indicate that  
20 the current requirement was not adequate if that makes  
21 sense.

22 The particular interim staff guidance is  
23 out for comment. Right now comments are due the 8th  
24 of June. We intend to submit comments on behalf of  
25 the industry.

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1           Most of the comments will be of a  
2 clarifying nature to make sure we understand the  
3 language, et cetera, which brings me to a more generic  
4 communication process issue. You know how I feel  
5 about generic communications based upon comments I  
6 made earlier.

7           The one thing that is not clear to us as  
8 an industry is why there is a need for an ISG process  
9 to begin with given that the NRC already has a  
10 well-established generic communication process that  
11 could be used as a vehicle for communicating staff  
12 guidance going forward.

13           So now we have generic communications.  
14 And we also have interim staff guidance, two separate  
15 processes that basically overlap. So we're going to  
16 continue making that point with every opportunity we  
17 have.

18           Lastly, I understand some question has  
19 been raised about the idea of continuing or the idea  
20 of imposing ultrasonic testing requirements. I want  
21 to make it clear that the current requirements that we  
22 currently have are for a graded approach to a visual  
23 examination.

24           And depending upon what you find, you do  
25 a more comprehensive examination, but the first step

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1 is a visual. And that's basic --

2 CHAIRMAN WALLIS: How do you visually  
3 inspect these inaccessible areas?

4 MR. MARRION: Well, as you heard from the  
5 staff, you do an examination of the inaccessible areas  
6 based upon what you find of the accessible areas if I  
7 have characterized it properly in what the staff was  
8 proposing.

9 And for the Mark I's, we intend to  
10 continue that process going forward. And we will be  
11 commenting accordingly on the ISG comments.

12 CHAIRMAN WALLIS: You have to be able to  
13 access some place which is relatively typical of the  
14 inaccessible places in order to do that.

15 MR. MARRION: Yes. I'm not familiar with  
16 the details of what that is, yes.

17 That's all I have, sir.

18 MEMBER ARMIJO: I just think that is  
19 fundamentally unsound because you have, really, a  
20 crevice condition in that sand pocket area. It's not  
21 at all represented by the accessible area.

22 And so looking at a safe location to make  
23 a judgment of a susceptible location seems to me a  
24 waste of time. I mean, if the accessible area is  
25 highly corroded, you can be sure that the inaccessible

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1 is in bad shape.

2 MR. MARRION: Right.

3 MEMBER ARMIJO: But the converse isn't  
4 true.

5 MEMBER APOSTOLAKIS: But didn't Jack say  
6 that for the water to get to the inaccessible area, it  
7 has to go through the accessible areas?

8 MEMBER ARMIJO: Yes, but it doesn't stay  
9 there.

10 VICE CHAIRMAN SHACK: It doesn't stay  
11 there.

12 MEMBER ARMIJO: It flows.

13 VICE CHAIRMAN SHACK: You have got a drain  
14 right at that thing. I mean, there is no way for  
15 water to really accumulate --

16 MEMBER APOSTOLAKIS: It is not  
17 accumulating.

18 VICE CHAIRMAN SHACK: -- in that  
19 accessible area.

20 CHAIRMAN WALLIS: But it gets to the sound  
21 --

22 MEMBER APOSTOLAKIS: But you are going to  
23 see some moisture or something.

24 MEMBER ARMIJO: You can make a case that  
25 if it's always been dry, that's your best case. You

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1 have good data.

2 MEMBER MAYNARD: I thought part of that,  
3 it would depend on what you include as a visual area  
4 for what you base -- if you're including the drains  
5 and if there is any moisture coming out of the sand  
6 drains or anything like that, well, that might be  
7 appropriate. But if you're saying that all you have  
8 to do is just visually look at the inside of the  
9 container there, that you don't have to do anything  
10 else.

11 But if you include as part of what you  
12 find visually results of drains and other things --

13 MR. MARRION: That is a comprehensive  
14 examination requirement that's in 50.55(a) right now.

15 Thank you. And I appreciate the time I  
16 spent with this illustrious body today.

17 (Laughter.)

18 MEMBER KRESS: We are honored to have you.

19 MEMBER BONACA: If there are no further  
20 questions, first of all, I want to thank the staff for  
21 their presentations and for the information. And then  
22 I'll turn the meeting back to you, Chairman.

23 CHAIRMAN WALLIS: Thank you very much.

24 We are finished with our formal  
25 presentations for the day.

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1 MEMBER KRESS: We don't have a letter on  
2 this particular issue?

3 MEMBER BONACA: No.

4 MEMBER KRESS: This was just a briefing?

5 CHAIRMAN WALLIS: Just a briefing. It was  
6 just a briefing.

7 MEMBER BONACA: There is no impact  
8 because, I mean, it was helpful because, again,  
9 yesterday we had a --

10 CHAIRMAN WALLIS: We don't need that --

11 MEMBER KRESS: Are we going to give some  
12 feedback now or anything on what we've heard or do you  
13 think the questions are sufficient?

14 VICE CHAIRMAN SHACK: The questions were  
15 sufficient.

16 CHAIRMAN WALLIS: Unless you have another  
17 point you want to make. Do you want to make some  
18 point?

19 MEMBER KRESS: Well, my point was that I  
20 just don't like this round-about way of doing things  
21 in the sense that I think there's a fatal flaw in  
22 trying to use the accessible areas to determine  
23 whether or not there is a problem in the inaccessible  
24 areas.

25 I would do what Bill Shack just said. Why

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1 not just include those sources of moisture within the  
2 scope?

3 VICE CHAIRMAN SHACK: Well, I think --

4 MEMBER KRESS: I know it has been resisted  
5 by the industry, but it doesn't seem like that big of  
6 a burden to me. I think that's the real solution.  
7 And that's what they're after, but they're trying to  
8 do it in a round-about way.

9 VICE CHAIRMAN SHACK: I also think a  
10 techie could come up with a way to measure those  
11 thicknesses.

12 MEMBER KRESS: Show me that way, and that  
13 may be okay. That's possible.

14 MEMBER SIEBER: Well, when you put the  
15 refueling seal in the scope, all you're doing is  
16 establishing an aging management program for that.  
17 That doesn't prevent leakage necessarily because there  
18 may be something other than the aging that causes the  
19 leaking.

20 MEMBER KRESS: Okay. Maybe. Maybe I am  
21 flawed.

22 MEMBER SIEBER: You could twist it, and  
23 now it leaks.

24 CHAIRMAN WALLIS: You should probably  
25 inspect a more susceptible area, which is a sand

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1 pocket.

2 MEMBER SIEBER: I think you have to deal  
3 with the --

4 MEMBER BONACA: In the past we left it to  
5 the --

6 MEMBER SIEBER: -- rather than deal with  
7 something that is removed from it.

8 MEMBER BONACA: In the past we left it to  
9 a licensee to have a choice. For example, in Browns  
10 Ferry, the staff was asking for inspection of the  
11 seals. They fought that. We left them open, either  
12 that or UT the liner in the vulnerable locations. And  
13 they chose to UT the liners.

14 The burden is inaccessibility because  
15 there is going to be that every ten years. And when  
16 they do the ISR, they are in containment. And they  
17 physically can then perform most of the utilities in  
18 those locations. So we left open those possibilities.

19 I take your point, and I think the  
20 Committee should decide. Should we have a comment on  
21 this or -- the intent wasn't one of providing a  
22 letter. This was an informational presentation, but  
23 --

24 CHAIRMAN WALLIS: I think the staff has  
25 heard our comments. It was a preliminary sort of

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1 thing. And that is probably good enough for now.

2 MR. GILLESPIE: We appreciate the comments  
3 because, as Mario said, underground cabling, piping,  
4 and this kind of large passive component are really  
5 becoming kind of the end point. Everything else we  
6 know how to deal with for the most part.

7 But I will say in this case -- and let me  
8 take Browns Ferry. You might say, well, why did  
9 Browns Ferry choose UT versus the seals. Browns Ferry  
10 actually had unidentified sources of leakage. And he  
11 said versus trying to identify every source of leakage  
12 because they didn't know where it was that their  
13 cheapest way out was actually to do the UT.

14 But they got the idea that we wanted to  
15 wait. And you had to assure us this thing was going  
16 to be okay relative to thickness.

17 VICE CHAIRMAN SHACK: That sand pocket is  
18 pretty big. I mean, you can have a fair amount of  
19 moisture in there that you're never going to see  
20 coming out of those drains. And, yet, you could have  
21 attack over a reasonable fraction of that.

22 MEMBER SIEBER: There are oodles of  
23 surface in there for the moisture to collect on.

24 MR. GILLESPIE: But, again, the locations  
25 of the drains are plant-specific. Some plants have

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1 seals, as Monticello had over it. Some places have a  
2 liner or coding on the other side of the surface.

3 VICE CHAIRMAN SHACK: Well, a bottom drain  
4 would give me a whole lot more comfort than that top  
5 drain would.

6 MR. GILLESPIE: Yes. The other thing is  
7 the sand is very compacted.

8 MEMBER KRESS: Have you ever tried to  
9 drain moisture out of the sand from the bottom? It  
10 doesn't come out.

11 MR. GILLESPIE: I don't want to pooh-pooh  
12 it, but the idea that this is a 130-degree area also  
13 --

14 VICE CHAIRMAN SHACK: You drive it out  
15 with --

16 MR. GILLESPIE: And so you're going to  
17 drive it out. And so you've actually got the occasion  
18 to get water in there about 20 days every 18 months or  
19 24 months depending on the fuel cycle someone is on  
20 and how long it's flooded. And that's why we've  
21 started to key into visual. You might say, visual  
22 leakage from someplace kicks you into needing to do a  
23 UT.

24 Now, what this inter-staff guidance  
25 position does do is says the identification of

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1 moisture, basically leakage, is equivalent to the  
2 visual recognition of accelerated corrosion on the  
3 inside. And that's an important distinction, which  
4 never existed before.

5 So for the inaccessible areas, we're using  
6 the indirect indication of seeing water as kind of an  
7 assumption that you have to do the same thing as if  
8 you saw accelerated corrosion on the inside. That  
9 gets us a measurement on an event basis.

10 And so someone who is sworn to keeping  
11 this thing dry, if they have an event during a  
12 refueling where they get leakage in there, now they're  
13 obligated to do something which is a bit more onerous  
14 and reestablish their rate.

15 It's not perfect. By the way, there are  
16 two inaccessible areas. We should be clear on that.  
17 There is the inaccessible area in the air gap. And  
18 then there's this inaccessible area that's layered on  
19 the bottom between the two concrete layers, which is  
20 really probably the most difficult area, but it was  
21 designed to last 40 years. It is totally lined with  
22 concrete. And then you've got this temperature  
23 gradient.

24 CHAIRMAN WALLIS: Is 40 years good enough  
25 with license renewal, though?

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1 MR. GILLESPIE: Now, it was originally  
2 designed for 40 years, but that was kind of an  
3 assignment. But now if you have no evidence of in  
4 leakage or water in there, I mean, again, it's  
5 indirect stuff. It's almost like a circumstantial  
6 case we're acting --

7 CHAIRMAN WALLIS: Concrete is not dry all  
8 the time.

9 MR. GILLESPIE: Concrete is porous  
10 material, and it is not dry all the time. And so then  
11 you could ask questions. A fair question in the aging  
12 management program is, what are you doing about  
13 groundwater? And do we have any evidence of  
14 groundwater?

15 We asked that from Nine Mile. And I think  
16 we're coming. I signed up the draft SE this morning.  
17 So I think next month we're probably coming on Nine  
18 Mile. They have actually got alarms on their drains  
19 if moisture is detected.

20 So every plant is doing some unique  
21 things.

22 CHAIRMAN WALLIS: Moisture can come out of  
23 the concrete. There is a lot of concrete. There is  
24 a late curing of the concrete which goes on for a long  
25 time. Then it can be damp. It doesn't have to be

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1 very damp --

2 MR. GILLESPIE: Right.

3 CHAIRMAN WALLIS: -- to produce some  
4 chemical reaction.

5 MR. GILLESPIE: What is the impact? This  
6 is what I don't know, is what is the impact of this  
7 temperature gradient.

8 CHAIRMAN WALLIS: You don't have oxygen.  
9 So that is probably what protects you.

10 MR. GILLESPIE: And so there is a number  
11 of things that -- we're doing our best, appreciate the  
12 Committee's comments, and more than happy. If anyone  
13 else has any better ideas, we would love to have them,  
14 but this ISG was an effort to send a benchmark for  
15 basically the best-performing plant on liners.

16 It has no moisture. What if you get  
17 moisture? How do you establish your rate? This is  
18 kind of putting out, in essence, that they now know we  
19 do expect a rate to even be established. We didn't  
20 have that in writing before.

21 CHAIRMAN WALLIS: We won't comment on it,  
22 and we hope it works out.

23 MR. GILLESPIE: Well, feel free to comment  
24 on it. We're happy to have comments. NEI is going to  
25 feel free to comment on it.

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1 CHAIRMAN WALLIS: We won't.

2 MEMBER BONACA: Certainly we will comment  
3 on individual applications.

4 MR. GILLESPIE: Yes. I do think this is  
5 middle ground we are wrestling with here because I do  
6 agree with Alex that the individual designs that we're  
7 applying this concept to are significantly different.  
8 In critical questions, like locations of drains, some  
9 are going to be more susceptible than others.

10 As I said, Browns Ferry said we have  
11 unidentified leakage. We know we have leakage. It's  
12 not a lot. UT is our answer. It's the only way that  
13 could give us positive confirmation.

14 CHAIRMAN WALLIS: Have they been having  
15 leakage on their reactor which has been shut down for  
16 all that period of time, unidentified leakage?

17 MR. GILLESPIE: Well, remember, we license  
18 units I, II, and III. The floor wasn't flooded on 1.  
19 So they haven't had any leakage on I for a long time.

20 CHAIRMAN WALLIS: They think they haven't.  
21 They could have an unidentified leakage.

22 MR. GILLESPIE: They had some unidentified  
23 leakage from refuelings in the other units, and they  
24 chose UT.

25 MEMBER SIEBER: They have them for fuel

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1 for --

2 MR. GILLESPIE: By the way, this is a very  
3 high-dose area, too. And so the question here isn't  
4 money.

5 MEMBER BONACA: Not only they. I mean --

6 MR. GILLESPIE: It's going to be dose.

7 MEMBER BONACA: Where the seals are, it's  
8 a very high red area.

9 MR. GILLESPIE: Yes.

10 MEMBER BONACA: Not down in the sand  
11 pocket.

12 MR. GILLESPIE: It depends on where you're  
13 at. You're directly under the vessel.

14 CHAIRMAN WALLIS: No one is going to go  
15 down there.

16 MR. GILLESPIE: My understanding from the  
17 licensees is from a radiological perspective, this is  
18 not an area you want to take lightly doing extra  
19 measurements over and above what you really need to  
20 confirm your --

21 CHAIRMAN WALLIS: BSBWR has hatches that  
22 you go in into the reactor pedestal area.

23 MEMBER BONACA: We were told by TVA that  
24 it is not a high red area because it is well below the  
25 --

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1                   MEMBER KRESS:  Graham, I was wondering if  
2                   the staff is considering a user need letter to  
3                   Research to try to develop a way to do this more  
4                   definitively, maybe strong on ultrasonics or  
5                   something.  Is there such a user need letter or any --

6                   VICE CHAIRMAN SHACK:  Well, there is  
7                   something from Oak Ridge now.

8                   MR. GILLESPIE:  Actually, there is a  
9                   letter report that just recently got put in ADAM from  
10                  Oak Ridge, from a project that Research sponsored, but  
11                  it is not commercially available yet.  And, as best I  
12                  understand it, it is a technique to calibrate for this  
13                  concrete steel concrete sandwich.

14                  I think, as I understand it, there are  
15                  three different alternative approaches to doing it.  
16                  And so the information is starting to be developed and  
17                  published.  But we're probably years away from actual  
18                  commercial application to go from the research bench  
19                  to the --

20                  MEMBER KRESS:  Yes, but you have got years  
21                  to go to do it in.  I mean, the corrosion rate is low  
22                  enough that --

23                  MR. GILLESPIE:  I am not disagreeing.  If  
24                  the Committee would like to -- we think we're actually  
25                  pretty close right now on a plant-by-plant basis.  But

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1 if the Committee would like to write a letter  
2 recommending a research project, it's okay. I don't  
3 mind. It's your Committee.

4 MEMBER SIEBER: The question is what do  
5 you want to cut out to pay for it.

6 MEMBER MAYNARD: I would like to just add  
7 on to Tom's previous comment just a little bit. It  
8 doesn't surprise me. And I would expect the industry  
9 to resist new requirements, new changes to things. I  
10 think it better to get the fight over, have it once,  
11 rather than a lot of times.

12 So, rather than dealing with a lot of  
13 things through staff guidance, generic letters, a lot  
14 of times it would be better if this is going to be a  
15 new expectation, new requirement, let's follow the  
16 process and make that -- you know, get the fight over  
17 with once, make it happen, rather than continually  
18 trying to go around these systems just generically.

19 MEMBER SIEBER: The requirement has always  
20 been there. And it stems from the code requirement.  
21 The question is, what do you do and how do you do it  
22 to give yourself a reasonable assurance that you're  
23 okay.

24 MR. GILLESPIE: The new aspect now is  
25 people having to articulate in an aging management

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1 program what they're going to do to ensure that their  
2 monitoring and measurement process for this liner will  
3 detect its approach to minimum wall thickness prior to  
4 it getting there.

5 I mean, that's really what plant license  
6 renewal is, to ensure that you have the additional  
7 monitoring programs in place that you will detect and  
8 correct prior to exceeding that minimum wall  
9 thickness.

10 The discussion of this ISG between us and  
11 the industry is evoked. I think it has now gotten us  
12 to a point where we have some actual cases under our  
13 belt that have now, you might say, set the standard  
14 for the next ones to come in.

15 And now we've got each plant evaluating  
16 itself against the plants we have already looked at  
17 and saying, "Am I like them? Am I different? If I'm  
18 different, then is it a positive difference or  
19 negative difference?"

20 And now we're starting to get those kind  
21 of aging management considerations into this piece of  
22 equipment, which we did not have, quite honestly,  
23 going in until we hit Browns Ferry.

24 The Committee wants -- Mario will remember  
25 this. I forget which BWR they were in. It was on the

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1 steam dryers. And I used the Committee. I quoted the  
2 Committee to the staff on the liner. And it was on  
3 the dryers.

4 And, Mario, I forget. You might have been  
5 the one who said it. You said it's large, it's  
6 passive, and you just wrote a generic letter saying  
7 it's safety. It wasn't in scope before that statement  
8 was made. It's now in scope. And, you know, the  
9 staff said it's large, it's passive, it has corrosion,  
10 and it's safety. And so now we're trying to take it  
11 on head on. I think with some success, you're seeing  
12 the applications getting it addressed at some level of  
13 credibility now.

14 MR. THADANI: Graham, I have one quick  
15 question.

16 Frank, you noted this is a high-dose area.  
17 This issue is one important in many ways, has I think  
18 rather minimal risk to public. How is that sort of  
19 balanced in terms of the actions called for and its  
20 relative importance?

21 MR. GILLESPIE: I think how we are trying  
22 to deal with that -- and we have got a meeting with  
23 one applicant day after tomorrow, Oyster Creek, on  
24 this, on our residual concerns after their RAIs. And,  
25 really, what we started talking about was the

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1       uncertainties involved in the decision.

2                   And so the question really is, how much  
3       should you pay for certainty in a decision? Because  
4       the significant measurement uncertainty and doing  
5       these UT exams, they're actually fairly coarse.

6                   There is uncertainty in primers and  
7       liners, which have exceeded, basically, the  
8       manufacturer-recommended lives of 10 to 15 years.  
9       Yet, they're still there. And they're still being  
10      inspected doing what they're doing.

11                  There is uncertainty in have you picked  
12      enough selected locations because we are looking for  
13      a general area degradation. We're not looking for  
14      just pitting.

15                  The Committee didn't mention it, but there  
16      are really two concerns. One is pressure retention  
17      and accident. And the other is buckling, the sheer  
18      collapsing of this thing under its own weight. And so  
19      you've got two reasons to inspect two different areas.

20                  And so I would suggest that in this ISG  
21      and what we're seeing from these utilities, we're  
22      actually accepting, you might say, a fair level of  
23      uncertainty in it to keep it rational.

24                  And so the safety consideration is in how  
25      much do we want to press people to make it more and

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1 more certain. And so that's really how we're  
2 factoring in the safety significance of it.

3 When I talk about dose and how many  
4 measurements need to be taken, we need reasonable  
5 assurance. And in many cases, there's not positive  
6 evidence on either side because this is a large  
7 passive thing that was put in there. It's expected to  
8 last forever fundamentally from the designer's point  
9 of view. We're confirming that assertion.

10 CHAIRMAN WALLIS: It probably will in most  
11 plants last.

12 MR. GILLESPIE: In most plants, I think it  
13 will. And so it's a confirmation. And so we're not  
14 designing the plant, which is very vigorous. We're  
15 confirming that the expected performance will be  
16 sustained. And we probably can be slightly less  
17 rigorous in the uncertainty we accept on that.

18 CHAIRMAN WALLIS: That is all the agency  
19 ever does. It doesn't design plants.

20 MR. GILLESPIE: Right.

21 CHAIRMAN WALLIS: It confirms performance.

22 MR. GILLESPIE: But you learn how much,  
23 what you're going to do in that confirmation.

24 MEMBER BONACA: Yes.

25 CHAIRMAN WALLIS: I think we may have gone

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1 over. We have gone over 15 minutes. I think it's  
2 about time we --

3 MEMBER BONACA: One last comment I had was  
4 that, you know, so many of the -- however the  
5 inspection processes we still depend on, for example,  
6 the visual inspection of this, we are still at the  
7 pace that really was conceived at the moment these  
8 plants are put in renewal. Okay? So every ten years  
9 they go in and look at it. Okay?

10 To me, you know, as these plants get older  
11 and older, these inaccessible areas, et cetera, you  
12 know, then maybe the frequency with which we're  
13 looking at it becomes more questionable because, you  
14 know, every ten years, a lot of things can happen.

15 CHAIRMAN WALLIS: Especially when you  
16 start to find things.

17 MR. GILLESPIE: We have occasions in  
18 several licensees where because they were sticking to  
19 a more extended inspection period, even when they had  
20 evidence of water, they did not consider evidence of  
21 water equivalent to accelerated corrosion visually.

22 So this ISG actually tries to take the  
23 principle you just espoused and says, "You can no  
24 longer in our expectation, staff's expectation, you  
25 can no longer ignore the presence of water. You have

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1 to now give us positive confirmation that the rate of  
2 degradation is still being minimized.

3 CHAIRMAN WALLIS: It is not boric acid.

4 MR. GILLESPIE: Yes, yes. At least we're  
5 dealing with a general moisture.

6 CHAIRMAN WALLIS: Right.

7 MR. GILLESPIE: And so this actually does  
8 go for that extended period to some incidents in which  
9 we actually have evidence from various licensees.  
10 They had evidence of water and basically did an  
11 engineering evaluation and did not obtain positive  
12 information if the thickness was okay.

13 MEMBER BONACA: What are you going to do  
14 when one of the already approved license renewals is  
15 going to come in for another license renewal?

16 MR. GILLESPIE: They have talked to us  
17 about that.

18 MEMBER BONACA: Well.

19 MR. GILLESPIE: I'm hoping to be retired  
20 by that point.

21 MEMBER BONACA: Anyway, I think we will  
22 see how this works.

23 MR. GILLESPIE: I started with the draft  
24 of the renewal rule in 1989 and have been doing this  
25 now for the last five years. At some point, someone

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1 else should do it.

2 MEMBER BONACA: All right.

3 MR. GILLESPIE: Thank you.

4 MEMBER BONACA: I give you back the  
5 meeting, Mr. Chairman.

6 CHAIRMAN WALLIS: We are ready to come off  
7 the record. Thank you very much for recording the  
8 meeting today, and we will take a break until a  
9 quarter to 5:00.

10 And when we come back, we will finish  
11 Mario's letter, which seems to be fairly  
12 straightforward. And then we will know where we are  
13 going with the other letter, hopefully know well  
14 enough that we can see our way to the end of it  
15 tomorrow.

16 (Whereupon, the foregoing matter was  
17 concluded at 4:34 p.m.)

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# Official Transcript of Proceedings

## NUCLEAR REGULATORY COMMISSION

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533rd Meeting

Docket Number: (not applicable)

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS (ACRS)

533rd MEETING

+ + + + +

WEDNESDAY, MAY 31, 2006

+ + + + +

ROCKVILLE, MARYLAND

+ + + + +

The Subcommittee met in Room T2B1 at Two White Flint North, 11555 Rockville Pike, Rockville, Maryland, at 8:30 a.m., Graham B. Wallis, Subcommittee Chair, presiding.

MEMBERS PRESENT:

- GRAHAM B. WALLIS Chairman
- WILLIAM J. SHACK Vice Chairman
- GEORGE E. APOSTOLAKIS Member
- J. SAM ARMIJO Member
- MARIO V. BONACA Member
- RICHARD S. DENNING Member
- THOMAS S. KRESS Member
- OTTO L. MAYNARD Member
- JOHN D. SIEBER ACRS Member-At-Large
- JOHN LARKINS Designated Federal Official

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1       ACRS STAFF PRESENT:

2       HANS ASHAR                    NRR

3       DANIEL FRUMKIN                NRR

4       ALEX KLEIN                    NRR

5       THOMAS KOSHY                 EEEEB/DE/NRR

6       MICHAEL MAYFIELD             DE/NRR

7       GEORGE MORRIS                EEBE/DE/NRR

8       LINH TRANS                    NRR

9       GEORGE WILSON                NRR

10      ROBERT WOLFGANG             NRR

11      ROY WOODS                     RES

12

13      ALSO PRESENT:

14      HAROLD BARRETT               Duke Power Company

15      MIKE FALLON                  Constellation Energy

16      ALEX MARRION                 NEI

17      DAVID MISKIEWICZ            Progress Energy

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AGENDA ITEMS

PAGE

Opening Remarks, Chairman Graham B. Wallis . . . 4

Draft Final Generic Letter, "Post-Fire  
Safe-Shutdown Circuit Analysis  
Spurious Actuations" . . . . . 5

Draft Final Generic Letter 2006-XX,  
"Inaccessible or Underground Cable  
Failures that Disable Accident  
Mitigation Systems" . . . . . 149

Interim Staff Guidance on Aging Management  
Program for Inaccessible Areas of Boiling  
Water Reactor (BWR) Mark I Containment  
Drywall Shell . . . . . 195

Adjournment

## P R O C E E D I N G S

(8:31 a.m.)

CHAIRMAN WALLIS: The meeting will now come to order.

This is the first day of the 533rd meeting of the Advisory Committee on Reactor Safeguards. During today's meeting, the Committee will consider the following:

Draft Final Generic Letter, Post-Fire Safe-Shutdown Circuit Analysis Spurious Actuations, Draft Final General Letter, Inaccessible or Underground Cable Failures that Disable Accident Mitigation Systems, Interim Staff Guidance on Aging Management Program for Inaccessible Areas of Boiling Water Reactor Mark I Containment Drywell Shell, and Preparation of ACRS reports.

This meeting is being conducted in accordance with the provisions of the Federal Advisory Committee Act. Dr. John T. Larkins is the Designated Federal Official for the initial portion of the meeting.

We have received no written comments from members of the public regarding today's sessions. We have received a request from Alex Marrion, NEI, for time to make oral statements regarding the Generic

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1 Letter on Post-Fire Safe-Shutdown Circuit Analysis and  
2 the Generic Letter on Inaccessible or Underground  
3 Cable Failures that Disable Accident Mitigation  
4 Systems.

5 A transcript of portions of the meeting is  
6 being kept and it is requested that the speakers use  
7 one of the microphones, identify themselves, and speak  
8 with sufficient clarity and volume so that they can be  
9 readily heard.

10 I will begin with some items of current  
11 interest. In the items handed out to you, I notice  
12 that there is a speech by Commissioner Yatzko at the  
13 beginning. And at the end, there is an interesting  
14 article on various matters which complicate PWR sump  
15 evaluations.

16 Now in the middle of the day, we are going  
17 to have ethics training which is why the lunch break  
18 is so long today. And the ethics training is  
19 scheduled for between 12:15 and 1:30 so you should be  
20 here at 12:15 and ready to be trained in ethics.

21 That is the end of my prepared remarks.  
22 And I'd like to proceed with the meeting. Call on  
23 Rich Denning to get us started on the first item.

24 MEMBER DENNING: Thank you. We will be  
25 hearing from the staff regarding the draft final

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1 generic letter 2006-XX, Post-Fire Safety-Shutdown  
2 Circuit Analysis Spurious Actuations. The Committee  
3 will hear presentations by and hold discussion with  
4 representatives of the staff.

5 Additionally, Mr. Alex Marrion with NEI,  
6 has requested ten minutes to share NEI's perspective  
7 after the staff's presentation.

8 The Committee had requested to review the  
9 generic letter regarding Post-Fire Safe-Shutdown  
10 Circuit Analysis Spurious Actuations after the public  
11 comment period. We did not have a prior subcommittee  
12 meeting on this letter which may have been a mistake.

13 I have serious reservations about the  
14 balance between regulatory burden and approved safety  
15 associated with this letter. The letter leaves open  
16 options for risk informing this process but they are  
17 not easy activities to perform. So we are anxious to  
18 hear what the staff has to say on this. And to have  
19 a healthy discussion, I believe.

20 We have a considerable period of time  
21 actually to do this, three hours. But I think that we  
22 will want to look into this letter very carefully  
23 before giving our blessing.

24 I think we are now ready to hear from  
25 staff. And I'll turn it over to Alex Klein of the

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1 Office of Nuclear Reactor Regulation.

2 MR. KLEIN: Thank you very much. My name  
3 is Alex Klein. You see on the cover slide here my  
4 branch chief's name, Sunil Weekakkody. He extends his  
5 regrets for not being able to attend today's meeting  
6 in that he had a prior commitment for jury duty today.  
7 With that, I'm acting in his place so I will give the  
8 opening presentation.

9 The purpose of today's meeting and the  
10 presentation to the Committee is to present the final  
11 draft of Generic Letter 2006-XX, Post-Fire Safe-  
12 Shutdown Circuit Analysis Spurious Actuations. We are  
13 also here to obtain ACRS endorsement to issue the  
14 proposed generic letter.

15 I'd like to introduce the two primary  
16 staff members who will present today for NRR. To my  
17 left is Robert Wolfgang who is the primary author of  
18 the generic letter. And to my right is Daniel  
19 Frumkin, fire protection engineer, from the Office of  
20 NRR, who will speak to you about some of the NEI and  
21 EPRI fire testing.

22 We also have in the audience with us  
23 supporting staff members from NRR who were also  
24 instrumental in the development of this generic  
25 letter.

1           As an overview, I wanted to advise the  
2           Committee that there is a lot of history leading up to  
3           this generic letter. And you will hear some of this  
4           today. We did a bounding analysis, full of risk. We  
5           also did a regulatory analysis of the generic letter.  
6           But at this time, those slides are not in our  
7           presentation. But we are certainly prepared to  
8           discuss those aspects.

9           MEMBER DENNING: We absolutely would like  
10          to see those slides.

11          MR. KLEIN: Very good.

12          So the probability of spurious actuations  
13          due to fires will be presented by Dan Frumkin after I  
14          speak. And then after Dan speaks, we will receive a  
15          summary of the objectives of the generic letter by Bob  
16          Wolfgang.

17          Again, based upon the long history of this  
18          generic letter and so forth, there has been differing  
19          views between the industry and the NRC on the  
20          credibility of multiple spurious actuations. You will  
21          hear about the NEI/EPRI cable fire test results from  
22          Dan Frumkin, as I indicated.

23          I also wanted to indicate to the Committee  
24          that we are continuing with our inspections using  
25          risk-informed aspects. For example, RIS 2004-03,

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1 certainly one of the goals of issuing this generic  
2 letter is to reestablish compliance with the  
3 regulations.

4 That concludes my introductory remarks.  
5 And I'll hand over the presentation to Dan Frumkin.

6 CHAIRMAN WALLIS: When you present, could  
7 you make it clear to me just what it is you are asking  
8 industry to do because I had a lot of trouble figuring  
9 that out. There is a lot of sort of rather vague  
10 requirements it seems to me. And perhaps you can in  
11 your presentation make it clear just what it is they  
12 have to do.

13 MR. KLEIN: Yes.

14 MR. FRUMKIN: Good morning. My name is  
15 Dan Frumkin from the Office of NRR. I work for Sunil.  
16 And today I'm going to present some of the background  
17 from the NEI/EPRI testing that is discussed in the  
18 generic letter.

19 I see some new faces around the ACRS table  
20 so I'm going to pass around some tables from some  
21 testing that occurred. At the end of the cables that  
22 are fused together, you will be able to see two  
23 failure modes or examples of two failure modes. One  
24 is an inter-cable which is two cables -- or actually  
25 one is an intra-cable, which we use these terms intra

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1 within a single cable and inter between two separate  
2 cables. And this provides an example of both.

3 The highlighted portions within a cable  
4 are very close together that have failed together.  
5 And then we also have intruding cable that has  
6 penetrated the outer jacket and apparently the inner  
7 cable protection and come at least into very close  
8 contact which you can see.

9 We will talk also about the different  
10 types of cable. This is a thermal plastic cable,  
11 which is the more vulnerable cable, but as you can  
12 see, that it is subject to both failures from internal  
13 and external cables when put under the suitable heat  
14 or fire exposure.

15 So I'll be providing some background on  
16 the testing that provided the insight into the failure  
17 likelihoods, the objectives of that testing, some  
18 details of the testing, some of the test results, and  
19 a few conclusions based on the testing.

20 And then Mr. Wolfgang will be talking  
21 about the generic letter more specifically.

22 The NEI/EPRI testing was intended to  
23 address fire-induced circuit failure issues of concern  
24 to the NRC staff, principally the potential for  
25 spurious operations of equipment.

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1           This was intended to basically bring to  
2 close the question that the staff kept on bringing up  
3 that Browns Ferry had these and the industry said that  
4 well, it is very unlikely to occur. So this was  
5 intended to bring that to a close.

6           NRC witnessed the testing and also did  
7 some insulation resistant testing using Sandia  
8 National Laboratory resources.

9           And there are four documents that either  
10 in whole or in part document the results of some of  
11 the testing. The characterization of fire-induced  
12 circuit failures results is the big report from EPRI.

13           The circuit analysis failure modes and  
14 likelihood analysis is the Sandia Report of their  
15 insulation resistant testing.

16           These results were pulled into the NUREG  
17 6850, which is the fire protection re-quantification  
18 or the fire PRA methodology for nuclear power  
19 facilities. This is the state-of-the-art document  
20 that Research has developed to -- it is a handbook on  
21 how to do fire PRA.

22           And then there was the spurious actuation  
23 expert elicitation which was experts reviewing the  
24 testing and coming up with results.

25           The objectives, as I said, was to research

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1 the characteristics of fire-induced circuit failures  
2 to better understand these plants' responses to cable  
3 failures. And, as I said, the NRC also was involved  
4 in the testing and reviewed -- witnessed the testing  
5 and did their own insulation resistant testing.

6 So the details of the test, there were 18  
7 fire tests that were conducted between January 9th,  
8 2001 and June 1st, 2001 at the Omega Point  
9 Laboratories in San Antonio. And the three types of  
10 fire exposures were tested during the test. The hot  
11 gas layer region which is up at the ceiling level, the  
12 fire creates a buoyant plume and it fills the  
13 enclosure from the top down. And that is the hot gas  
14 layer.

15 Then below -- between the fire -- the  
16 actual fire and the hot gas layer is what we call the  
17 plume region where there is no flaming but that is a  
18 very hot part of the -- that is the hottest part of  
19 the smoke region of the fire.

20 And they also tested a radiant exposure  
21 where you get close to the fire itself or sometimes  
22 worst case could be up next to the plume region  
23 depending on emissivity of the smoke and the radiant  
24 energy coming off. If it is a clean burning flame, it  
25 may not have a high radiant energy but the smoke may

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1 be higher. So -- but they just used, I believe, a  
2 fixed radiant number but that is a little discussion  
3 of the radiant energy.

4 One thing that they didn't do that I will  
5 add is they did not put cables in the flaming region.  
6 That is why I have this highlighted. We, the staff,  
7 hear a lot from the licensees about how long it takes  
8 to have these cables fail. And that there is plenty  
9 of time in all situations for mitigation.

10 And based on the testing, yes, in a lot of  
11 the testing there was a lot of time before there was  
12 failure in, you know, 30, 40 minutes for some of the  
13 tests. But none of the tests tested this flaming  
14 region.

15 So this leaves the staff a very strong  
16 question of how fast -- well, first we don't know what  
17 failures will occur in that region. They could occur.  
18 They may not occur. We don't have the information.

19 It is very clear that if they do occur,  
20 they will occur much more quickly. The temperatures  
21 are over, you know, much -- a thousand degrees hotter  
22 in the flaming region. And there is also an ignition  
23 source. So it is a very different phenomenon. And  
24 cables could be exposed to a flaming region in the  
25 plant.

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1           So this test is not a complete picture of  
2           -- or let me just say that the timing factors that  
3           came out of the testing that was done are not a  
4           complete picture of the possible scenarios that could  
5           occur.

6           MEMBER APOSTOLAKIS: It appears that you  
7           were participating in the conduct of these tests. Did  
8           you express these concerns to EPRI when they were  
9           designing the tests?

10          MR. FRUMKIN: Well, I wasn't specifically  
11          involved in that. I don't believe that the test was  
12          intended to develop timing. And as such, it wouldn't  
13          have been an issue. The licensees or the industry has  
14          brought this timing issue and perhaps inappropriately  
15          based on the testing.

16          It is useful to heat this cable slowly  
17          because then the hot shorts would probably exist for  
18          a longer period of time. But whether this -- but my  
19          only point is that I don't believe that this testing  
20          provides a basis to say that hot shorts -- this test  
21          I don't think was intended or can provide a basis for  
22          timing. But I believe it is being applied or some  
23          intend to use it to show that there is a timing issue.

24          MEMBER APOSTOLAKIS: I would be such an  
25          obvious thing to do. I mean there must be a reason

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1 why they didn't do it. Do you know that? Or should  
2 we ask Mr. Marrion when he comes?

3 MR. FRUMKIN: Why they didn't do the  
4 flaming region? Yes, that is a fair question. But I  
5 believe the answer -- like I said, I do think that  
6 that was not -- if there hadn't been any failures  
7 outside of flaming region, I think there would have  
8 been a strong feeling that failures in the flaming  
9 region would have been maybe less likely. But it is  
10 a fair question.

11 MEMBER APOSTOLAKIS: Okay.

12 CHAIRMAN WALLIS: Does the material from  
13 which the insulation is made, does that actually burn  
14 at some temperature?

15 MR. FRUMKIN: Yes.

16 CHAIRMAN WALLIS: But if you stuck it in  
17 a flame, you would expect the insulation itself to  
18 catch fire.

19 MR. FRUMKIN: Yes. The ASTM -- or, I'm  
20 sorry, the IEEE 383 fire test that has been the  
21 standard fire test is actually a burning test. And it  
22 ignites the flames from the bottom in a vertical cable  
23 tray. And all the cables do catch on fire when  
24 exposed to flame. But some of them propagate more or  
25 less slowly.

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1           There are some specialized cables that  
2 don't catch on fire but those were not tested. Those  
3 aren't what we are talking about here.

4           So the results of the tests showed with  
5 some confidence that failures within multi-conductor  
6 cables are likely and when they do occur, they occur  
7 in multiple conductors within the same multiple  
8 conductor cable. So as you can see from that cable  
9 bundle, there may actually be more than one cable  
10 conductor within the cable further down the jacket  
11 that you can't see.

12           And then the way they are spiraled  
13 together in there so that various cables could come in  
14 contact with other cables within the same cable.  
15 Various conductors could come into contact with other  
16 conductors within the same cable.

17           In addition, multiple devices were shown  
18 -- the spurious actuation data showed that a single  
19 hot short within a multi-conductor cable usually  
20 effected actuation devices simultaneously. If there  
21 were two devices -- I believe the way they set this  
22 test up is they wanted a very practical approach.

23           So they actually put -- rather than doing  
24 similar to the Sandia testing where they used an  
25 insulation-resistance device, they used actual plant

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1 equipment, which they just plugged it in as they would  
2 in the plant and if it would actuate or not actuate.  
3 So it was a real pragmatic thing and they did actuate.  
4 And as the testing showed, some actuated  
5 simultaneously.

6 MEMBER MAYNARD: Did they also measure how  
7 long the signal stayed there? Or how long it  
8 actuated?

9 MR. FRUMKIN: Yes. And most of the hot  
10 shorts were of a short duration. And some were in the  
11 order of minutes, I believe.

12 This is a table of results of the best  
13 estimates given cable damage of a spurious actuation  
14 probability. And the purpose of this table is not to  
15 -- the purpose of this table is just to show that the  
16 NRC and the industry -- or at least the results from  
17 the EPRI report which was developed by industry, are  
18 very consistent.

19 The staff and the risk people in industry  
20 really are on the same page with the likelihood of  
21 spurious actuations. There are some factors of two  
22 here, differences, but in probabilistic and  
23 likelihoods, in that world it is a small difference.

24 CHAIRMAN WALLIS: This is strange to me.  
25 It must depend on the extent of the damage. I mean if

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1 you just burn a cable for a short time, nothing  
2 happens. If you burn it for long enough, you are  
3 going to get shorts. So you can't just have a  
4 probability. It is going to depend on the extent of  
5 the damage to the cable.

6 MR. FRUMKIN: Yes. In all these, cables  
7 were exposed to damage. So this is given that these  
8 cables were damaged.

9 CHAIRMAN WALLIS: But to what extent?

10 MEMBER APOSTOLAKIS: It is a critical  
11 probability. I mean -- or, as you said earlier --

12 PARTICIPANT: At some point the  
13 probability is one, right?

14 MEMBER APOSTOLAKIS: I mean there is a 0.6  
15 conditional probability that you will have a spurious  
16 actuation. This is conditional on the probability  
17 that the cable is damaged.

18 MR. FRUMKIN: Correct.

19 MEMBER APOSTOLAKIS: And what is that?

20 MR. FRUMKIN: That depends on the  
21 scenario. For example, if a cable is a foot above a  
22 piece of switch gear or let's say -- and this is not  
23 an unlikely situation -- a foot above 20 or 30 feet of  
24 switchgear. It runs across the cable tray, across the  
25 top of a number of pieces of switchgear, what is the

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1 probability?

2 Well, that could be calculated typically,  
3 I think, a single piece of switchgear is five times E  
4 to the minus five. Or, you know, in that range. But  
5 then it certainly would be damaged if there was even  
6 a small fire in that piece of switchgear.

7 So there is -- you could have cable -- and  
8 then that same cable does go through different areas  
9 where it could be exposed to different other fires.  
10 A single cable could go through three, four, five  
11 different areas and be exposed to a dozen different  
12 fire scenarios.

13 MEMBER DENNING: I think we have to  
14 recognize the context within which this is done,  
15 George. And I think it is important when we try to  
16 get into the question of risk informing this and that  
17 is basically we are doing a deterministic safe  
18 shutdown analysis in which you assume there is a fire  
19 in a zone -- in a fire area. And it can burn there  
20 for three hours. You know even though there are other  
21 mitigating things that would clear that, we assume it  
22 can burn for three hours.

23 So then the question is well, with this  
24 massive potential exposure, then you have got a cable  
25 running through there. What's the potential that it

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1 could then be heated up to a point at which you get  
2 this kind of interaction? You know it doesn't get at  
3 all into the questions of you have a fire in a room,  
4 what is the possibility that any cables are exposed,  
5 you know, before it is controlled.

6 MEMBER APOSTOLAKIS: But if we are doing  
7 a deterministic analysis, why are we calculated  
8 spurious actuation probabilities?

9 MEMBER DENNING: Well, let me give my view  
10 but I'd certainly like to hear your view, and that is  
11 that the question is not so much whether you can have  
12 spurious actuations but how many can you have? How  
13 many combinations of things can you deal with?

14 The industry has always agreed to looking  
15 at a spurious actuation on a one-at-a-time basis, you  
16 know. And so I think that what the staff is trying to  
17 do is to give the feeling that -- or their impression  
18 that this isn't the really rare event -- the extremely  
19 rare event that actually would have some kind of  
20 spurious actuation occurring.

21 And then I think by implication then maybe  
22 there is the potential for multiple spurious  
23 activations.

24 MEMBER APOSTOLAKIS: Well, the second  
25 bullet of the previous slide, I guess, is then the

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1 key, right? Is that what -- of devices?

2 MEMBER DENNING: Well, I would be curious.  
3 What is your -- if you were answering that question,  
4 how would you have answered George's question? Why  
5 are we looking at probabilities here now?

6 MR. FRUMKIN: Well, okay, maybe this slide  
7 was poorly planned. But the point of the slide is  
8 twofold. One is to say that with regard to  
9 probabilities, the staff and the industry people who  
10 do this work are on the same page.

11 And the second reason, I guess, is to show  
12 that these probabilities are very high in  
13 probabilistic space, that some of them are close --  
14 you know, 0.6, and then if you have a 0.6 scenario and  
15 you have two 0.6 scenarios, you've got a 0.36  
16 scenario. So that even multiple can be a fairly high  
17 probable.

18 MEMBER DENNING: Now help us though -- you  
19 can't say that without giving some conditionality of  
20 --

21 MR. FRUMKIN: Right.

22 MEMBER DENNING: -- 0.6 conditions on  
23 what?

24 MR. FRUMKIN: Cable damage.

25 MEMBER DENNING: Cable damage.

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1                   MEMBER ARMIJO: I have a problem with  
2 cable damage. Is this severe? Moderate? I have no  
3 feeling of -- I can see where all the insulation is  
4 burnt to a crisp and I would call that severe.  
5 Wouldn't these probabilities all be one?

6                   MR. FRUMKIN: No. Well, okay, so what  
7 this is talking about is the spurious actuation  
8 probability, not shorting situation. This is the  
9 likelihood of a hot short occurring within a cable  
10 without that cable shorting to its conduit or cable  
11 tray because generally once the hot conductors fail to  
12 the conduit or cable tray or the nearest ground, then  
13 they would certainly -- that would clear the spurious  
14 actuation.

15                  MEMBER MAYNARD: Okay. But I think there  
16 is a high probability if you make all the assumptions  
17 to get to this point. But you also have to factor in  
18 the probability of actually having a fire, for the  
19 fire going that long, for the operators not taking any  
20 action. There are a lot of other things getting up to  
21 that point that when you put it all in context --

22                  MEMBER APOSTOLAKIS: That is why I'm  
23 confused. We are either doing deterministic analysis  
24 or we are doing risk analysis. If we do risk  
25 analysis, then, of course, we have to do all this. If

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1 we do what Rich said, then it seems to me they are  
2 gone.

3 I mean you have three hours. Everybody is  
4 burning, right? I think as I recall from the early  
5 studies on this the real question is whether you will  
6 have a short -- a hot short first before an open  
7 circuit.

8 MR. FRUMKIN: Right. Before the short  
9 ground.

10 MEMBER APOSTOLAKIS: That is the critical  
11 thing.

12 MR. FRUMKIN: Yes.

13 MEMBER APOSTOLAKIS: And this is not  
14 answering that, is it?

15 MR. FRUMKIN: Yes, it is.

16 MEMBER APOSTOLAKIS: It is?

17 MR. FRUMKIN: This is the likelihood of  
18 that spurious actuation probability, not a short to  
19 ground.

20 MEMBER APOSTOLAKIS: Okay.

21 CHAIRMAN WALLIS: This is one spurious  
22 actuation.

23 MR. FRUMKIN: This is a single.

24 CHAIRMAN WALLIS: A single one although  
25 there are multiple wires in the cable?

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1 MR. FRUMKIN: Right. Well, this is a  
2 spurious actuation getting cable to damage within a  
3 cable or between -- there is an inter-cable factors  
4 here -- between two cables. So the point -- let's  
5 just say the 0.6 here is for within a single thermoset  
6 cable, the 0.2 or the 0.4, as the 6850 has it, is  
7 between -- or generally it is 0.3 is what has been  
8 used a lot -- is between two separate thermoset cables  
9 within the same tray.

10 And what the previous slide was trying to  
11 say is that within a single thermoset -- within a  
12 single multi-conductor cable, that more than one of  
13 the conductors are going to fail together with an 80  
14 percent likelihood. So it almost for sure that if  
15 let's say you have one hot conductor and four control  
16 conductors that could actuate four different pieces of  
17 equipment, that hot conductor will come into contact  
18 probably with all of them with the same likelihood,  
19 with this same 0.6.

20 CHAIRMAN WALLIS: Oh, with the same  
21 likelihood?

22 MR. FRUMKIN: Yes. It's not a 0.6 times  
23 0.6 times 0.6 in the same cable. Within that cable it  
24 is 0.6 times 0.8, if you will.

25 CHAIRMAN WALLIS: Okay.

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1 MR. FRUMKIN: So it is still -- it is  
2 almost 0.6.

3 MEMBER DENNING: Why are the inter-cable  
4 probabilities the same for thermal plastic and  
5 thermoset?

6 MR. FRUMKIN: Because -- oh, you mean this  
7 and this?

8 MEMBER DENNING: Yes.

9 MR. FRUMKIN: Inter-cable -- yes, I'm not  
10 -- that's just a -- well, intra-cable is very likely  
11 --

12 MEMBER DENNING: Intra-cable, I understand  
13 that.

14 MR. FRUMKIN: Yes, I don't -- I don't have  
15 --

16 CHAIRMAN WALLIS: What is the question,  
17 Rich?

18 MEMBER DENNING: It's thermoset is less  
19 likely -- one would think thermoset would be less  
20 likely to have inter-cable and perhaps they are the  
21 same here because there just haven't been any  
22 experiments done on a thermoset.

23 MR. FRUMKIN: I think that is it because  
24 you can see that that is one of the big differences,  
25 a factor of two here, and again the same factor of two

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1 for intra-cable -- inter-cable -- but yes, we're -- as  
2 Roy Woods is here, and we're doing more testing on  
3 this. But this is currently the state-of-the-art data  
4 on this.

5 And I can't explain the -- it's just that  
6 is what the data showed from the limited 18 tests.

7 CHAIRMAN WALLIS: Now we are talking about  
8 whether you are doing probabilistic or deterministic  
9 analysis. When we get to the generic letter, there  
10 are strange terms such as saying the licensee must  
11 assume the possibility of simultaneous multiple  
12 spurious actuation -- well that tells me nothing.

13 I'm assuming the possibility -- it says  
14 nothing about whether it is likely to be one or 0.6 or  
15 whatever.

16 MEMBER DENNING: What they are saying is  
17 one.

18 CHAIRMAN WALLIS: What does it mean?

19 MEMBER DENNING: It means one.

20 CHAIRMAN WALLIS: So possibility means a  
21 probability of one?

22 MEMBER DENNING: That's -- yes.

23 CHAIRMAN WALLIS: That wasn't clear to me  
24 at all. Okay.

25 MEMBER APOSTOLAKIS: We will come to the

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1 letter, I guess.

2 MEMBER DENNING: Yes. Continue.

3 MR. FRUMKIN: These are just some notes on  
4 the previous slide that some of the plants that use  
5 the CPTs, which are the control power transformers,  
6 that reduces the likelihood of spurious actuations.

7 MEMBER APOSTOLAKIS: All of these  
8 probabilities, of course, mean nothing now.

9 MR. FRUMKIN: Right, yes.

10 MEMBER APOSTOLAKIS: They are one.

11 MR. FRUMKIN: Okay. Well --

12 MEMBER DENNING: But we are going to get  
13 to risk informing at some point here.

14 MR. FRUMKIN: Absolutely. Right. So  
15 those were just notes on the previous slide which was  
16 unfortunately put in here.

17 In conclusion, a review of the test data  
18 readily illustrates that hot shorts often involve more  
19 than one conductor. And that concurrent hot shorts  
20 within a cable are probable and should be considered  
21 during circuit analysis.

22 That's the end of this presentation. And  
23 the point of this is just to lay the groundwork that  
24 simultaneous spurious actuations and simultaneous  
25 multiple spurious actuations have been shown by

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1 testing, by industry testing, to occur.

2 MEMBER DENNING: Now there is more testing  
3 that is in progress. It is your feeling that that  
4 testing could then -- will it be done within a time  
5 period where we add value to the licensee when the  
6 licensee is basically responding the generic letter?

7 MR. FRUMKIN: Yes, that testing is planned  
8 to be done by the end of the year. And that pool of  
9 data will be available -- certainly for risk-informed  
10 evaluations for the licensees to use. But the experts  
11 doing the testing don't believe that there is going to  
12 be -- they believe these numbers are going to be  
13 honed.

14 They believe that there are going to be  
15 more cable combinations tested here than in the 18  
16 EPRI tests -- EPRI/NEI tests. But they don't believe  
17 that for the information that was on that table are  
18 going to be changed by an order of magnitude. It's  
19 maybe a 50 percent change or something of that nature.

20 MEMBER DENNING: If we have time later on,  
21 could we have a short presentation by someone about  
22 what is still to happen? And what different  
23 configurations basically have been untested at this  
24 point that will be tested?

25 MR. FRUMKIN: Well, Roy Woods is sitting

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1 behind you. And I'm not sure if he is prepared to  
2 talk about this testing.

3 MEMBER DENNING: Let me say I'm not asking  
4 for you to do it right now. But do you think you  
5 could do it later?

6 MR. WOODS: Sure. Roy Woods, RES. Yes,  
7 certainly we can make a presentation to you whenever  
8 you want on the testing. The plans are well made. We  
9 are about to start within days or a week at most. It  
10 is actually about to happen.

11 MEMBER DENNING: Okay. Well, let's go  
12 ahead --

13 MR. FRUMKIN: I think they want something  
14 later this morning, right?

15 MEMBER DENNING: Yes, later this morning.  
16 Absolutely, yes. Later this morning.

17 MEMBER APOSTOLAKIS: That's what happens  
18 when you have three hours.

19 MEMBER DENNING: Right, yes. Thanks. Can  
20 you run any of those tests by eleven?

21 MR. WOLFGANG: My name is Bob Wolfgang.  
22 I'm a fire protection engineer in NRR. And I'm going  
23 to give you information on the draft generic letter  
24 Post-Fire Safe-Shutdown Circuit Analysis Spurious  
25 Actuations.

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1           A summary of the presentation, I'll go  
2 over the purpose of issuing the generic letter, the  
3 information we are requesting from licensees, the  
4 background on this issue since 1997, the basis for the  
5 generic letter, the issue that is clarified in the  
6 generic letter, public comments, and a summary at the  
7 end.

8           The purpose of issuing the generic letter  
9 is to clarify how the NEI/EPRI cable fire test program  
10 reaffirms long-held regulatory positions and provide  
11 part of a foundation for licensees who are planning to  
12 transition to NFPA 805.

13           Also, to respond to the Agency's need to  
14 provide clarification and closure of outstanding fire  
15 protection issues, respond to --

16           MEMBER APOSTOLAKIS: Excuse me. Are you  
17 going to come back to these? I mean this on slide 16,  
18 the foundation for licensees planning to transition,  
19 will you elaborate on these later? Or can you tell us  
20 a few words now?

21           MR. WOLFGANG: Well, that's --

22           MEMBER APOSTOLAKIS: Why is that relative  
23 to NFPA 805?

24           MR. WOLFGANG: This is just to show that  
25 multiple spurious actuations should be included in

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1 their risk analysis model.

2 MEMBER DENNING: Well, since George has  
3 raised the question, let me ask it now. And that is  
4 NFPA 805 is one of the ways -- transitioning to NFPA  
5 805 is one of the ways that a licensee can respond to  
6 this. Now my question is how long does it take to  
7 transition to NFPA 805?

8 And I don't quite understanding within the  
9 time periods of the 90 days and six months and this  
10 kind of stuff, within the context of a transition to  
11 NFPA 805, when did that transition actually have to  
12 occur for the licensee to be able to use that pathway?

13 MR. WOLFGANG: All they have to do is  
14 respond to us within I believe it is the 90 days.  
15 That they are transiting to NFPA 805. And they will  
16 take care of this situation during that process.

17 MEMBER DENNING: Then how long would they  
18 have to transition to NFPA 805?

19 MR. WOLFGANG: They have -- what is it?  
20 Is it three years?

21 PARTICIPANT: Three years.

22 MEMBER DENNING: Three years?

23 MEMBER APOSTOLAKIS: Yes, it is a long  
24 time.

25 MR. KLEIN: Let me describe briefly. This

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1 is Alex Klein. Let me briefly describe the process a  
2 licensee would use if he wants to transition to NFPA  
3 805. And that is once the licensee had made the  
4 determination that he does want to transition to 805  
5 because that is an option for him, if he submits a  
6 letter of intent to the agency indicating that that is  
7 what he wishes to do.

8 At that point, we review that letter and  
9 make a determination as to whether or not the schedule  
10 that the licensee has laid out is acceptable to the  
11 Agency. And what we have right now in place is a  
12 three-year time frame for licensees to transition with  
13 the option of extending that time frame if the  
14 licensee can provide us with sufficient justifications  
15 beyond the three-year time period.

16 Now within that three-year time period, a  
17 licensee would submit their letter of intend, do the  
18 act of transition into NFPA 805. And then before that  
19 three-year time period is over, we would submit their  
20 license amendment to the staff for our review and  
21 approval prior to them actually receiving the  
22 amendment.

23 MEMBER APOSTOLAKIS: It seems to me that  
24 the -- actually is the first bullet in the previous  
25 slide that is important because the licensee that

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1 wants to transition to NFPA 805 has to convince you,  
2 I think, that they complied with all the regulations,  
3 right? There may be a few exceptions, as I remember  
4 for a period of time, and all that.

5 So the primary reason seems to be to  
6 reaffirm long-held regulatory positions because  
7 somebody who wants to transition has to demonstrate  
8 that they complied with all that.

9 MR. KLEIN: That is correct. Really I  
10 think the primary purpose of the generic letter is  
11 that first bullet on that slide 16.

12 MEMBER APOSTOLAKIS: Right, right.

13 MR. KLEIN: Yes. As an added benefit, it  
14 does provide the foundation for licensees who want to  
15 transition to 805.

16 MEMBER DENNING: Now wait a second. I  
17 definitely did not understand this. I mean clearly  
18 there are a lot of licensees out there that did not --  
19 cannot respond to multiple spurious actuations. And  
20 they are not going to have to bring their plant into  
21 compliance with having to meet all the multiple  
22 spurious actuations before going to NFPA 805 because  
23 then NFPA 805 doesn't help them at all, right?

24 MR. FRUMKIN: Yes, that is correct. And  
25 what Dr. Apostolakis was saying is correct is that we

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1 have an enforcement discretion in place so those  
2 licensees who discover during transitions that they  
3 are not in compliance can do a risk analysis of that  
4 and determine that it is not red, that it is not  
5 wilful, that it is not a severity one violation.

6 And, therefore, they can comp it -- put  
7 compensatory actions in place and move forward towards  
8 transition without necessarily correcting that in  
9 accordance with the old fire protection program.

10 MEMBER DENNING: But one thing that I  
11 think is an issue though and that is suppose there is  
12 a plant out there that would really like to do the  
13 NFPA 805 approach but within the 90-day period, don't  
14 they have to go through the entire analysis and  
15 identify the SSCs that are potentially vulnerable  
16 based upon this detailed multiple spurious actuation  
17 evaluation which seems to me like an extremely  
18 difficult problem to undertake.

19 Is that true that they have to really  
20 analyze the whole system within 90 days according to  
21 this multiple spurious actuations and identify  
22 vulnerable SSCs? Am I correct or not correct?

23 MR. WOLFGANG: Well, they have to -- well,  
24 I'll get to that on a slide here.

25 MEMBER DENNING: Okay, if you will get to

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1 it, you can go ahead.

2 MEMBER MAYNARD: I would like to challenge  
3 that first statement just a little bit though. And I  
4 know that it has been a long-held position by members  
5 of the staff but as far as, you know, NRC position,  
6 there are a number of licenses that were issued and  
7 plants inspected and with their programs were approved  
8 and licensed without making this assumption.

9 And I'm not convinced that it has clearly  
10 been a recognized regulatory requirement. And again,  
11 I know licenses were issued, programs were reviewed  
12 without making -- otherwise, we wouldn't even be here  
13 today if those licenses weren't issued at that time.  
14 So I would challenge that. The first statement.

15 MR. WOLFGANG: We know SERs have been  
16 issued for Byron and Braidwood with a single spurious  
17 actuation per fire event. And we've come to the  
18 conclusion basically that was issued as a mistake.  
19 That was a mistake.

20 MEMBER MAYNARD: But I know that there are  
21 a lot of plants out there a license. Their analysis  
22 were reviewed, their programs were reviewed. I know  
23 I was personally involved with them back in the '80s  
24 when some of these issues were starting to come to a  
25 highlight. And I know that there are a number of

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1 plants out there with licenses that although it may  
2 not be documented as clearly, that it was known that  
3 multiple spurious actuations were not taken in account  
4 in that analysis.

5 I don't think it is clear that this is  
6 just confirming compliance to requirements that were  
7 in place. I think it is a different set of  
8 assumptions.

9 MR. FRUMKIN: Yes, and this may, I agree  
10 that your assumptions apply to probably a number of  
11 plants out there. But for the most part, Appendix R,  
12 10 CFR 50, Appendix R, Section 3(g)(ii) and 3(g)(ii)  
13 which is the alternate and dedicated shutdown are what  
14 is in question.

15 The NRC went in and did an analysis of the  
16 3(g)(iii) alternate shutdown. And for a lot of  
17 3(g)(iii) which is, for lack of a better description,  
18 a control room abandonment, they allowed the  
19 assumption of one spurious actuation. 3(g)(ii) wasn't  
20 across the board inspected in the 80s. It was assumed  
21 that licensees could wrap or protect or would have  
22 adequate separation.

23 And it wasn't evaluated for multiple  
24 spurious because generally the staff didn't believe  
25 that -- well, I'm not sure why they didn't do it. But

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1 the big question was this alternate shutdown.

2 And in the 90s, we had the thermal lag.

3 And a lot of that wrap was taken out. And a lot of  
4 manual actions or assumptions were put into place.

5 And I don't mean to say that there was -- well, the  
6 point that I am trying to make is that there was  
7 another change. There was the removal of a lot of  
8 these thermal lag which was relied on to protect  
9 cables and probably would have mitigated many spurious  
10 actuations, many multiple spurious.

11 MEMBER MAYNARD: And I'm not saying at  
12 this point that they shouldn't be considered now. I'm  
13 challenging the regulatory positions that says all  
14 along everybody should have always done this. I think  
15 that, you know, we're now setting, you know, these are  
16 the things that definitely need to be considered.

17 If those were considered 20, 30 years ago,  
18 if that was part of the regulatory position for the  
19 licenses, we wouldn't have gone through a 20-year  
20 period here of trying to figure out what it really  
21 requires the licensee to do. Again, it's a regulatory  
22 -- I believe that this is something that falls within  
23 the backfit.

24 It needs a better analysis overall. And  
25 that doesn't mean that it is a bad thing to do. I'm

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1 just saying that I do not believe that we can take the  
2 position that this is a requirement that has already  
3 been there, that everybody should have already done.  
4 And that is kind of what we are saying in this generic  
5 letter.

6 MR. KLEIN: This is Alex Klein of NRR. I  
7 just wanted to add to the discussion here that -- and  
8 Bob can clarify this also for me -- is that the  
9 generic letter did receive CRGR approval. We did go  
10 to that Committee.

11 There are subsequent slides in Bob's  
12 presentation, I think 23, 24, 25, that does talk  
13 about the background, the regulatory background that  
14 you are speaking of that might clarify some of these  
15 discussion questions.

16 MEMBER MAYNARD: I'd be glad to look at  
17 that.

18 MR. WOLFGANG: Well, and also attend CFR  
19 Part 50, Appendix R, it also talks about you have to  
20 consider hot shorts. It doesn't set a limit on the  
21 number.

22 MEMBER MAYNARD: Well, I understand that.  
23 But there is a number of the regulations that come to  
24 an agreement between the licensee and staff as to what  
25 are -- what do you have to assume in a number of those

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1 things.

2 So anyway, we will get into it maybe aq  
3 little more with the regulatory evaluation. But I do  
4 not agree that --

5 CHAIRMAN WALLIS: Well, could we clarify  
6 this first bullet? I mean it seems to me that if we  
7 did have this long-held regulatory position, which was  
8 being enforced, then you wouldn't need this generic  
9 letter.

10 MEMBER MAYNARD: Right.

11 CHAIRMAN WALLIS: So something has changed  
12 as the result of these tests. So maybe there was a  
13 position which wasn't very well enforced or something  
14 or was not properly interpreted by the industry. Is  
15 that the problem?

16 MEMBER MAYNARD: Or the staff?

17 CHAIRMAN WALLIS: Well, the staff, yes.

18 MR. FRUMKIN: Well, I think we -- well,  
19 Bob, I think I would say that something did change.  
20 And that thing may not have been entirely the tests.  
21 I think that the staff had high confidence that these  
22 fire barriers that were installed were separating  
23 these redundant trains.

24 And they were removed and they were  
25 replaced with non-barrier solutions which were

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1 analysis, manual actions, and those type of things.  
2 And as soon as the NRC started inspecting post-thermal  
3 lag fixes, which was in 1997, well before these tests.

4 We had numerous -- there was an information notice  
5 97-something which presented numerous hot short and  
6 multiple -- well, numerous alternate associated  
7 circuits and circuit failure type issues.

8 So to hang this entirely on the test is  
9 not -- certainly the staff position goes before -- to  
10 before the tests. And that has been documented in  
11 that generic -- that information notice and there was  
12 a letter sent to NEI which expressed this sentiment  
13 well before -- I believe that was before the test as  
14 well.

15 CHAIRMAN WALLIS: The purpose of the  
16 generic letter is to reinforcement your enforcement  
17 which you were a bit lax about before or something?  
18 Is that what its purpose is?

19 MR. WOLFGANG: There was a lot of  
20 confusion. You were talking about 3(g)(iii) about  
21 alternative and dedicated shutdown systems and the use  
22 of one only -- you had to consider one spurious  
23 actuation there --

24 MR. FRUMKIN: Right, 3(g)(iii) and the  
25 Generic Letter 86-10 talked about spurious actuations

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1 quite a bit but the staff position is that those  
2 didn't apply to 3(g)(ii) and they were erroneously  
3 applied to 3(g)(ii), which is all we're really talking  
4 about right now. We are not talking about these 3(g)  
5 (iii) inspections that occurred in the 80s. We're not  
6 talking about the 3(g)(iii) approvals.

7 Every 3(g)(iii) program should have been  
8 approved with an SER. That was the policy. But we  
9 did not go into the 3(g)(ii) areas because the  
10 barriers and those solutions should have been  
11 sufficient.

12 MEMBER MAYNARD: It just seems to me that  
13 with all the confusion that has gone on for a number  
14 of years on this, a much cleaner way of doing this is  
15 if the NRC believes that this is something that needs  
16 to be done is just to come out with it as a  
17 requirement following the process for rulemaking, for  
18 changes, or whatever rather than trying to handle it  
19 through a generic letter requesting information to  
20 show compliance with a very confusing set of  
21 requirements.

22 MEMBER-AT-LARGE SIEBER: I suspect,  
23 though, that the staff does not believe that  
24 rulemaking is required, that the proper regulations  
25 already exist.

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1 MR. FRUMKIN: That is correct.

2 MEMBER-AT-LARGE SIEBER: In the review  
3 process that the staff has used in the past does not  
4 establish new regulations. The regulations are the  
5 regulations. And how the staff reviews something is  
6 another matter.

7 MEMBER MAYNARD: Well, how they review it  
8 but what it is accepted as to your certain assumptions  
9 and things --

10 MEMBER DENNING: I'm sure we are going to  
11 come back to this issue. So why don't you go ahead --

12 MEMBER-AT-LARGE SIEBER: It won't go away.

13 MR. WOLFGANG: Okay, moving to the next  
14 slide, more purposes of issuing a generic letter,  
15 respond to the Agency's need to provide clarification  
16 and closure of outstanding fire protection issues,  
17 respond to the licensee's request to provide  
18 clarification of regulatory expectations, and respond  
19 to the region's request to provide clarification of  
20 regulatory expectations for circuit inspections. And  
21 circuit inspections were resumed January 2005.

22 Generic letter, what information it is  
23 requesting from the licensees. Within 90 days to  
24 evaluate their licensing basis and information in the  
25 generic letter regarding multiple spurious actuations

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1 in the Post-Fire Safe-Shutdown Circuit Analysis.

2 MEMBER MAYNARD: Is that practical to  
3 expect -- I think we might get into a little bit more  
4 as to what we are really asking here but within 90  
5 days, for the whole industry to do this, I'm sure  
6 there is going to be some resources -- external  
7 resources needed in some cases.

8 With the whole industry trying to use  
9 those, is 90 days really a practical time frame to get  
10 what is really being asked for here?

11 CHAIRMAN WALLIS: Well, we believe that it  
12 is. But, you know, I guess when NEI talks, they have  
13 a consensus from the industry that it is not a  
14 sufficient time, We can always adjust that.

15 MR. WOLFGANG: Yes, I think what is being  
16 asked here is not for the technical evaluation of the  
17 entire circuit analysis. What we are asking for is  
18 for licensees to report whether they have a multiple  
19 spurious licensing basis or they have a single  
20 spurious licensing basis.

21 For those plants that have a multiple  
22 spurious and haven't analyzed for multiple spurious,  
23 then that is going to be a long-term fix. All we are  
24 asking them to do is to report their situation within  
25 90 days, which is a licensing --

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1                   MEMBER DENNING: Wait a second. How do  
2 they submit their functionality assessment of effected  
3 SSCs without doing that total analysis? Am I missing  
4 something here? And this is within 90 days, if  
5 you're not in compliance, you have to submit this  
6 functionality assessment of effected SSCs.

7                   MEMBER APOSTOLAKIS: And compensatory  
8 measures.

9                   MEMBER DENNING: And compensatory  
10 measures. I think that is the whole analysis, isn't  
11 it? I mean you don't necessarily know how you are  
12 going to ultimately correct them but it seems to me  
13 that the analysis has to be done in 90 days.

14                   Incidentally, I should have mentioned that  
15 listening in is EPM, which is a company that does this  
16 kind of stuff. But I should have mentioned that  
17 earlier that we do have an open line here.

18                   I'm sorry, go ahead.

19                   MR. WOLFGANG: Yes, what we are asking --  
20 yes, to submit the functionality assessment of  
21 effected SSCs.

22                   MEMBER DENNING: Yes. How do you  
23 determine what SSCs are effected unless you have  
24 looked at the multiple spurious actuations.

25                   MR. WOLFGANG: Yes, they have to look at

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1 the multiple spurious actuations.

2 MR. FRUMKIN: First, I agree with the  
3 member that doing a full analysis for 104 plants in 90  
4 days is not going to be credible. This is a major  
5 effort to look at that.

6 I believe though that the second bullet of  
7 compensatory measures for these areas where the plants  
8 are capable of putting compensatory measures and then  
9 solving the problems in a long-term program. That is  
10 credible. That is possible.

11 MEMBER APOSTOLAKIS: It seems to me that  
12 the 90 days applies to the first bullet but not the  
13 sub bullets.

14 MEMBER MAYNARD: I think it does a -- it  
15 certainly applies to the first bullet.

16 MEMBER DENNING: But the sub bullets are  
17 there in the generic letter.

18 CHAIRMAN WALLIS: Well, why is there an  
19 assumption that they are not in compliance now? I  
20 mean that they have done various things today to meet  
21 the regulations already. And their position would  
22 probably be we are in compliance now. So what are you  
23 asking us to do?

24 MEMBER DENNING: No, I don't think so.

25 MEMBER-AT-LARGE SIEBER: Well, if you took

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1 the lag out of your plant --

2 CHAIRMAN WALLIS: That's the problem.  
3 They have changed something.

4 MEMBER-AT-LARGE SIEBER: You changed the  
5 configuration.

6 CHAIRMAN WALLIS: That is okay. So they  
7 have changed something. Thank you.

8 MEMBER DENNING: It is not just that,  
9 Graham. They have argued that this has not been the  
10 requirement. That you didn't have to do multiple  
11 spurious actuations. They did one at a time or a  
12 single. So they would argue this is not the  
13 regulatory -- they would argue that it is new  
14 requirement but kind of like Otto has.

15 MEMBER KRESS: But the regulation says  
16 broadly that under these conditions, you have to have  
17 one train of safe shutdown. And that can only be  
18 interpreted as multiple spurious actuation I think.

19 MEMBER MAYNARD: I don't think -- I don't  
20 agree with that. Through the regulatory process, you  
21 don't necessarily have to assume everything that  
22 anybody could ever conceivably come up with. And so  
23 that's why the NRC and the industry -- but you decide  
24 on a set of assumptions. And what you really have to  
25 assume to reasonably meet that requirement.

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1           And then as new information comes along,  
2           if those previous assumptions weren't conservative  
3           enough, you may need to do that. But that really  
4           constitutes a change there. Otherwise why would you  
5           have any guidance documents or any -- what is allowed  
6           to assume or whatever. So I would argue that it is  
7           part of it.

8           MEMBER DENNING: In some respect, this is  
9           an open-ended problem in terms of, you know, and so it  
10          begs for some kind of guidance as to where you end the  
11          search for things that can go wrong.

12          Continue.

13          MR. WOLFGANG: We are asking that within  
14          six months to submit the plan to return all effected  
15          SSCs to compliance with the regulatory requirements.  
16          And that is the plant modifications, license .  
17          Exemption request.

18          And we are also asking that within 30  
19          days, if you cannot meet the 90-day, six month  
20          schedule that we are requesting, you provide us  
21          notification you cannot meet it and your suggested  
22          schedule and completion date.

23          CHAIRMAN WALLIS: What kind of things  
24          would they do to come into compliance? Are they going  
25          to change these offending cables? Are they going to

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1 change the way in which they put out fires? Are they  
2 going to change the actual equipment in the SSC? It  
3 is very open ended what they are expected to do.

4 MR. WOLFGANG: Yes, they can protect  
5 cables. They can reroute cables. They can submit  
6 license amendments based on a risk analysis method --  
7 those type of things.

8 CHAIRMAN WALLIS: Manual actions?

9 MR. WOLFGANG: Well, not in 3(g)(ii)  
10 space. There are a lot of ways.

11 MEMBER DENNING: I don't know how  
12 expensive those ways are. I mean we say there are  
13 lots of ways but those ways may be extremely  
14 expensive.

15 CHAIRMAN WALLIS: Well, I'm also unclear  
16 about what it is they are supposed to assume can go  
17 wrong? When I read these things about they are  
18 supposed to assume the possibility that this can  
19 happen, it goes back to Otto's question here.

20 I mean if you assume the very worst that  
21 could possibly happen, then you could have enormous  
22 changes in the plants in order to avoid this worst  
23 conceivable thing. Is that what you are asking them  
24 to do?

25 MR. WOLFGANG: You have to assume all

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1 multiple spurious actuations.

2 CHAIRMAN WALLIS: Well, but that is a  
3 major thing, isn't it?

4 MEMBER MAYNARD: That is major.

5 CHAIRMAN WALLIS: You have to assume that  
6 it happens with the probability of one?

7 MR. WOLFGANG: Yes.

8 MEMBER-AT-LARGE SIEBER: Yes. On the  
9 other hand --

10 MR. WOLFGANG: 3(g)(ii) in deterministic  
11 space doesn't limit the number of --

12 MEMBER-AT-LARGE SIEBER: On the other  
13 hand, you restrict the fire to a single fire area,  
14 which means that if you have appropriate separation or  
15 fire barriers that you have a train that is free of  
16 fire, that will operate.

17 MR. WOLFGANG: Right.

18 MEMBER-AT-LARGE SIEBER: And that is the  
19 principle. I think it is going to vary dramatically  
20 from plant to plant, especially based on the age of  
21 the plant and the type of plant. I think some are  
22 going to be tremendously impacted. Some others may  
23 not. And again, depending on what assumptions you  
24 really have to make and what credit you can take for  
25 things you already have in place, things that have

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1 already been done, everything from operator actions to  
2 fire loadings, improvement in fire control,  
3 everything.

4 MEMBER DENNING: And, Jack, you talked  
5 about the separating of trains. And that's, you know,  
6 pretty straight forward. But isn't the real open  
7 endedness related to the spurious actuations where  
8 there is some unanticipated valve opens that effective  
9 give you a loss of coolant accident or something like  
10 that, that, you know, introduces a different element  
11 to safe shutdown. Isn't that the open-endedness that  
12 makes it so difficult.

13 And I also don't know whether -- how many  
14 plants really know what cables are in what trays  
15 within a room.

16 Obviously if you are going to do -- yes so  
17 that you basically are assuming anything within the  
18 room -- I mean you know that -- you have concluded  
19 that it has gone through a room up to this point.  
20 But, you know, they could be in totally different  
21 trays in the room. But you don't know where they are  
22 in the room.

23 CHAIRMAN WALLIS: Well, you have to assume  
24 that they are all together and they are all --

25 MEMBER DENNING: Assume that you have to

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1 submit it. But I don't know the answer to that.

2 MEMBER KRESS: Assume that you have to do  
3 it. But I don't know the answer to that.

4 MR. WOLFGANG: Well in a fire area in a  
5 room, if you assume a fire, you have to assume  
6 everything is --

7 MEMBER KRESS: Yes, but can everything  
8 have an inter --

9 CHAIRMAN WALLIS: Everything in that room  
10 can short together?

11 MEMBER KRESS: -- can it short together as  
12 an inter-cable connection even though it may be way  
13 separated?

14 MR. FRUMKIN: No, if it couldn't occur,  
15 then it wouldn't be -- I mean you wouldn't have -- we  
16 wouldn't be expecting energized cables to penetrate  
17 conduits. We wouldn't expect energized cables to jump  
18 from tray to tray.

19 Or, for example, DC current has to have  
20 the same path. If it is not in the same tray or same  
21 conduit you couldn't actuate that from an AC circuit  
22 or something of that nature.

23 MEMBER DENNING: I don't know whether --  
24 what utilities know what cables --

25 MR. FRUMKIN: Right, no, you are correct.

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1                   MEMBER DENNING: -- are in what trays you  
2 were going to run.

3                   MR. FRUMKIN: And that can be a very  
4 significant effort.

5                   One of the aspects is that for the  
6 3(g)(ii) area -- or for the 3(g)(iii) plants, some of  
7 the older plants are 3(g)(iii). And they don't have  
8 very much separation at all. But they have done a  
9 significant analysis that was reviewed in the 80s  
10 which we referred to earlier. And they do have the --  
11 because they have done that detailed analysis, they  
12 have the flexibility to do manual actions.

13                   So in effect, the newer plants with the  
14 good separation should be fairly well off. The older  
15 plants that had very little separation probably have  
16 done a lot of this analysis already and may already be  
17 in compliance.

18                   It is the middle plants that are more  
19 likely than the older plants to have the circuits  
20 traced. But they are kind of in the middle there.  
21 And they are the ones who I think are going to be  
22 having a more difficult time answering this generic  
23 letter.

24                   MEMBER-AT-LARGE SIEBER: That is a pretty  
25 limited number of plants then. This issue is, you

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1 know, I was a young man when this issue came out. The  
2 work has been done. And the plants that were built in  
3 the 80s, to my knowledge they all had pull tickets  
4 associated with cables when they were originally  
5 routed.

6 So you just run your computer and it tells  
7 you whether you've got separation or not. And if you  
8 don't, what circuits are offending circuits.

9 MR. FRUMKIN: Many plants have that. Or  
10 some plants have that.

11 MEMBER-AT-LARGE SIEBER: Some plants have  
12 it. Some plants had to do that all manually, hand  
13 over hand.

14 MR. FRUMKIN: But I just want to add one  
15 thing that the staff has come our with a statement --  
16 or, well, not really a statement but what 3(g)(ii)  
17 says is that when cables of the redundant trays are  
18 within the same fire area and are not protected, so if  
19 you have a area with train A equipment in it and no  
20 train B equipment or the train B is protected in  
21 accordance with 3(g)(iii) protection criteria, we're  
22 not -- so with the train B protected, we're not  
23 limiting the actions that -- the feasible and reliable  
24 actions for failures on train A.

25 So if you have a protected train outside

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1 of a fire area or protected with 3(g)(ii), the  
2 licensees can do feasible and reliable manual actions  
3 on the fire-effected train to let's say close that  
4 valve that opens spuriously or stop that pump that  
5 opens spuriously because there is a full -- typically  
6 from the control room, so there is good annunciation  
7 and indication, there is a full protected train  
8 outside of that fire-effected area.

9 And I'll just point to Alex and see if he  
10 nods at me. Okay, yes.

11 MEMBER-AT-LARGE SIEBER: And there is very  
12 limited amounts of equipment if you had a spurious  
13 actuation, would cause another accident like a LOCA.  
14 Some value opens in the valve is -- like a safety  
15 injection valve, is designed to pump in not pump out.

16 Okay, so there are check valves and things  
17 like that that would prevent that. But there area  
18 few cases -- PRVs for example --

19 MR. FRUMKIN: Yes, PRVs is one I was  
20 thinking of if you --

21 MEMBER-AT-LARGE SIEBER: Yes , that could  
22 open and --

23 CHAIRMAN WALLIS: New plant designs have  
24 this screw valves. And the spurious actuation of them  
25 create a LOCA.

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1 MEMBER-AT-LARGE SIEBER: Yes, but they  
2 have them so you get to a safer condition, right?

3 CHAIRMAN WALLIS: One question I was going  
4 to --

5 MEMBER-AT-LARGE SIEBER: It is just  
6 expensive to do it.

7 MEMBER DENNING: Yes, is there any kind of  
8 assessment as to what fraction of spurious actuations  
9 actually are deleterious as far as effecting safe  
10 shutdown capability? I mean has anybody in a risk  
11 study done that kind of an assessment? Or do you have  
12 any feeling as to the fraction of spurious actuations  
13 that will get you into trouble?

14 MR. FRUMKIN: Well, you asked for that.  
15 We have this bounding analysis that we did and you  
16 actually -- well, you have to look at a lot to find  
17 the ones that are going to give you problems from a  
18 spurious actuation standpoint. But in our bounding  
19 analysis, it took five pairs of spurious actuations in  
20 order to get a significant risk.

21 And it is because these spurious system --  
22 these multiple spurious effect systems that, you know,  
23 are the redundant train. So it effects both -- the  
24 train, the productive train or the unprotected train,  
25 and the redundant train so you really lose all your

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1 protection with these scenarios. And it doesn't --  
2 you have to look at a lot to find the bad players.  
3 And there don't actually have to be a lot of bad  
4 players, at least based on our bounding analysis for  
5 it to be of fairly high risk significance.

6 MEMBER DENNING: Continue please.

7 MR. WOLFGANG: Background since 1997,  
8 multiple LERs brought lack of consensus concerning  
9 circuits to the staff's attention. And this led to a  
10 moratorium on inspection of circuit issues back in  
11 1997.

12 In 2001, NEI/EPRI cable fire test  
13 demonstrated that multiple spurious actuations can  
14 occur. And they can occur in rapid succession or  
15 simultaneously without sufficient time for mitigation  
16 in between.

17 Therefore if a licensee doesn't account  
18 for multiple spurious actuations, and its circuits  
19 analysis, the licensee may not be in compliance with  
20 10 CFR 50.48 and 10 CFR Part 50, Appendix A, General  
21 Design Criteria, and (3) which require that a licensee  
22 provide and maintain free from fire damage, one train  
23 of systems necessary to achieve and maintain the safe  
24 shutdown.

25 Staff has developed the risk-informed

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1 approach to inspections to focus on risk-significant  
2 configurations based on the cable fire test. And this  
3 is RIS 2004-003.

4 MEMBER DENNING: Now let me ask with  
5 regard to that, I understand that that was prepared  
6 for inspection as opposed to compliance.

7 MR. WOLFGANG: Correct.

8 MEMBER DENNING: But is there a real  
9 reason why one couldn't use guidance of that type for  
10 compliance as well? Do you see a regulatory  
11 constraint that would prevent you from -- I mean from  
12 the regulations that exist now, do you think it would  
13 be incompatible for the staff to provide the  
14 equivalent, perhaps a perturbation off of that or  
15 perhaps a revision to NEI's risk-informed guidance?  
16 Why can't we do that?

17 MR. WOLFGANG: I think the thing is we  
18 haven't seen licensee's risk tools, their model that  
19 we would have to approve prior to them using any risk  
20 analysis.

21 MR. KLEIN: Let me take a shot at  
22 answering the question maybe at a higher level. And  
23 that is with respect to licensees who are required to  
24 meet the requirements of Appendix R. Don't today have  
25 the ability to change that regulation or the

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1 commitment to that regulation based upon risk  
2 information.

3 If they want to do that, they would have  
4 to seek an exemption request from us against the  
5 regulation. They may certainly use risk information if  
6 they want to come in and see us with an exemption  
7 request, that is certainly open to them.

8 But what I think Bob is indicating is that  
9 a licensee may not make a change in their plant using  
10 risk information and making the conclusion based upon  
11 their standard license condition that says that, you  
12 know, it doesn't effect their ability to achieve and  
13 maintain safe shutdown.

14 The staff has been telling licensees that  
15 we would like them to come in and see us for such an  
16 exemption request or a license amendment.

17 MEMBER DENNING: Yes, I understand that  
18 that is the way -- that is the process by which they  
19 would use risk information to do that. But this first  
20 bullet is generic. It is generic information as to  
21 how many combinations of things or what are kinds of  
22 situations that are -- could be expected to be risk  
23 significant?

24 Now I realize it is not totally complete  
25 but it, you know, it gave guidance to the inspectors

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1 as to what are the combinations of things that could  
2 risk significant to look at and make sure. And I  
3 don't see any reason why one couldn't effectively rule  
4 out some of this total space of situations that the  
5 applicant has to look at to be compliant.

6 Now, you know, Tom is saying -- and I  
7 think it is kind of the regulatory position that  
8 you've got to look at everything because anything that  
9 can prevent this safe shutdown pathway is a potential  
10 problem. But you used it for the inspector to give  
11 him guidance on what is risk important and not in the  
12 area.

13 Couldn't you have done the same to provide  
14 generic guidance on this is how far you have to go in  
15 this process of looking at multiple spurious  
16 actuations.

17 MR. FRUMKIN: Bob, let me -- I'll be  
18 candid. We tried very hard to read 3(g)(ii) as a --  
19 to be risk informed in the way you describe. And with  
20 help from our lawyers, we were unable to get there for  
21 those pre-`79 plants. And then there is also the  
22 Agency or the Commission has approved a risk-informed  
23 rule.

24 And although it is more comprehensive,  
25 that is out there. And we considered the possibility

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1 of a risk-informed changed to this rule, to the  
2 current 3(g)(ii), and there is currently a rule that  
3 has been promulgated by the Commission. So that did  
4 not seem like a credible approach.

5 CHAIRMAN WALLIS: Well, could I follow up  
6 on that? And I looked at this risk informed approach.  
7 It seems to be just advice on vendors --

8 MR. FRUMKIN: Yes?

9 CHAIRMAN WALLIS: -- to focus on certain  
10 configurations. Well, that's okay. Focus on what  
11 matters. But then how does this inspector decide to  
12 reach some sort of a finding that something is not  
13 adequate? Or is not in compliance. That would get  
14 closer to tying these things together because the  
15 whole question here is what do they have to do in  
16 order to be in compliance.

17 MR. FRUMKIN: That is correct.

18 CHAIRMAN WALLIS: And how does the  
19 inspector know when they are in compliance or not?  
20 Well, he has just chose to focus on these things. How  
21 does he then decide when he is focused whether or not  
22 they are in compliance?

23 MR. FRUMKIN: And the answer to that is  
24 they pull up the licensing basis and if the licensing  
25 basis, if they do not have -- are not licensed for

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1 single spurious, that are considered to be -- required  
2 to look for multiple spurious.

3 CHAIRMAN WALLIS: Well then what are they  
4 supposed to do?

5 MR. FRUMKIN: Then that would be -- that  
6 could be -- that would be a finding would be run  
7 through the risk analysis of this STP. It would be  
8 cited. And the licensee would have to resolve a  
9 finding in the normal manner.

10 MEMBER DENNING: Incidentally, I think  
11 your last statement about their legal interpretation  
12 of pre-`79 is very important as far as our  
13 considerations are concerned because I mean it could  
14 be indeed that we are in a box in terms of whether you  
15 can risk inform the current regulation or whether you  
16 would need to change a rule which is obviously a huge  
17 undertaking.

18 CHAIRMAN WALLIS: Well, I'm really  
19 wondering, you made an initial statement that we  
20 should have had a subcommittee meeting. We seem to be  
21 at the level of behaving like a subcommittee so trying  
22 to determine whether or not you are ready to go to the  
23 full Committee because there seems to be so many  
24 questions here. And yet we are here as a full  
25 Committee.

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1                   MEMBER DENNING: That is why we have three  
2 whole hours.

3                   CHAIRMAN WALLIS: You know subcommittees  
4 sometimes have the option of saying you guys aren't  
5 ready. You shouldn't go to the full Committee. But  
6 they are here.

7                   MEMBER DENNING: The full Committee has  
8 that same option, doesn't it?

9                   MR. WOLFGANG: To continue, in 2004, staff  
10 held a public meeting in Atlanta to discuss the staff  
11 positions and solicit stakeholder feedback. We worked  
12 with NEI to finalize an acceptable industry guidance  
13 document for circuit analysis. And that was NEI 0001.

14                   Staff issued RIS 2005-30 to clarify  
15 regulatory requirements for a circuit analysis. And  
16 that RIS addressed the terms associated circuits, any  
17 and all, and emergency control stations.

18                   And this draft generic letter was issued  
19 for public comment in October 2005. We held a public  
20 meeting in March of this year. And the pertinent  
21 public comments were incorporated into the final draft  
22 of the generic letter. And we also received CRGR  
23 approval to issue the generic letter.

24                   The basis for the generic letter -- the  
25 bulleted review of NRC regulations, generic

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1 communications, correspondence related to this issue.  
2 And we have references identified in the generic  
3 letter. The results of the 2001 NEI EPRI cable fire  
4 test program, prior to the cable fire test, there was  
5 very little information available regarding circuit  
6 failure during a fire which made enforcement of the  
7 regulations in this area difficult. And also input  
8 from inspectors on issues that needed to be addressed.

9 The issue clarified in the generic letter  
10 is multiple spurious actuations. As Dan said earlier,  
11 some licensees claim that only a single spurious  
12 actuation had to be assumed in their circuit analysis.  
13 This was based on a misinterpretation of Generic  
14 Letter 86-10 in response to question 5.3.10.

15 And also some licensees claimed multiple  
16 spurious actuation occur with sufficient time in  
17 between them to take mitigating actions.

18 CHAIRMAN WALLIS: Now this  
19 misinterpretation has been going on for how long?  
20 D.L. 86 is 9/86?

21 MR. WOLFGANG: Yes.

22 CHAIRMAN WALLIS: Over 20 years they have  
23 been under some misapprehension about the regulations?

24 MR. WOLFGANG: That is my understanding.

25 MR. FRUMKIN: In this section of the

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1 generic letter, it refers to the 3(g)(iii) associated  
2 circuits I believe. So it took 3(g)(iii) alternate  
3 shutdown -- I'm sorry -- it took this 3(g)(iii)  
4 assumption and applied it to 3(g)(ii) areas. And that  
5 is what this misinterpretation is describing.

6 MEMBER APOSTOLAKIS: Let me understand it  
7 a little bit the second bullet here. Suppose there is  
8 sufficient time between actuations? Okay, so you have  
9 the first one. You really don't know what the second  
10 one is going to be, right? It could be anything.

11 MR. WOLFGANG: Second.

12 MEMBER APOSTOLAKIS: Oh, let's say there  
13 are two --

14 MR. WOLFGANG: Actuations?

15 MEMBER APOSTOLAKIS: -- spurious -- yes.

16 MR. WOLFGANG: Yes, based on these tests,  
17 they could occur --

18 MEMBER APOSTOLAKIS: No, I understand  
19 that, that it is a very short time.

20 MR. WOLFGANG: Right.

21 MEMBER APOSTOLAKIS: But let's assume for  
22 a moment that there is sufficient time, there is long  
23 time between them.

24 MEMBER DENNING: And there may be, George.  
25 There is a contention that --

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1 MEMBER APOSTOLAKIS: Okay.

2 MEMBER DENNING: Yes, right.

3 MEMBER APOSTOLAKIS: But you still don't  
4 know what the second one is going to be.

5 MEMBER DENNING: Is going to be, right.

6 MEMBER APOSTOLAKIS: So you can really  
7 take mitigations actions without know what the second  
8 will be?

9 MEMBER DENNING: Well, now wait a second.  
10 If you have mitigated the first one --

11 MEMBER APOSTOLAKIS: Yes.

12 MEMBER DENNING: -- then it is as if you  
13 now just have one.

14 MEMBER APOSTOLAKIS: Oh, so now you are  
15 going to get together and wait.

16 MR. WOLFGANG: And when the second one  
17 occurs and you have time to mitigate that one.

18 MEMBER APOSTOLAKIS: And this is doable?  
19 I mean has anybody looked into the details of this?  
20 It comes back to this issue of open endedness. You  
21 really don't know what is going to happen next. So I  
22 don't understand this particular -- I mean have they  
23 submitted details, you know, if you have sufficient  
24 time, you will protect the plant?

25 MEMBER DENNING: You know what I think

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1 would help us is we had some better feeling as to how  
2 do they really mitigate these actuations?

3 MEMBER APOSTOLAKIS: Yes, exactly,  
4 exactly.

5 MEMBER DENNING: What is a typical -- and  
6 I know there are constraints on manual --

7 MR. WOLFGANG: Yes, in 3(g)(ii), they  
8 can't use manual actions.

9 MR. KLEIN: Licensees have commonly used  
10 operator manual actions to mitigate that spurious  
11 actuation. They may send an operator out in a plant  
12 to close a valve or some such action like that. And  
13 then they wait for the next actuation and they say,  
14 okay, I've got plenty of time available to have taken  
15 that first action. And now they wait for the second  
16 action. And when that occurs, they send the operator  
17 out.

18 So I think that second bullet there is to  
19 just simply indicate to the Committee that that is the  
20 claim that some licensees have made. That is not  
21 necessarily a position that the staff agrees with.

22 MEMBER APOSTOLAKIS: No, I understand  
23 that.

24 MR. WOLFGANG: Yes.

25 MEMBER APOSTOLAKIS: But I'm trying to

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1 understand the position.

2 MEMBER DENNING: Now suppose you had --  
3 suppose it takes 30 minutes to have them get out there  
4 and close the valve, now obviously -- more than, you  
5 know, and then something else happens say before he  
6 closes that valve, then the real question is there a  
7 compounding effect?

8 MR. WOLFGANG: And I guess like --

9 MEMBER DENNING: As far as you don't have  
10 enough operators that you can send out to do all these  
11 --

12 MEMBER APOSTOLAKIS: The real question is  
13 is the length of time the critical variable here. And  
14 it doesn't seem to me to be.

15 MR. FRUMKIN: I mean we'll give you an  
16 example, for example if you have a -- you going to  
17 drain two valves in series that would drain the RWST  
18 and you also damage a number of other equipment. They  
19 fail. They short out and become unavailable.

20 Well, if you have -- if you lose the  
21 indication on the RWST and you open up the valve and  
22 you say you have plenty of time to -- you have  
23 indication the valve opened spuriously, you can go  
24 down and close the valve and then when the next valve  
25 opens, it has no effect.

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1 I think that would be an example of where  
2 they feel they would have sufficient time. Let's say  
3 the circuits are in cable trays -- you know, 20, you  
4 know, six cable trays above. There is going to be a  
5 good deal of time before the first cable tray is  
6 damaged and the next -- the first cable is damaged and  
7 then the next cable.

8 So -- and from a risk standpoint, you  
9 might be able to argue yes, we will have adequate  
10 indication that the valve opened and we have adequate  
11 time. And then that could be a risk-informed type  
12 analysis.

13 But if they are in the same cable, then  
14 they both could open simultaneously.

15 MEMBER MAYNARD: If there is time and  
16 there are a number of things they can do, when you  
17 have a fire in an area, you typically know what cables  
18 and what other things could be potentially effected in  
19 that and the manual actions going out either manually  
20 isolating valves, pulling breakers, a number of things  
21 you can do. But it is based on what is in that area  
22 or what could be effected with those in that area.

23 MEMBER APOSTOLAKIS: I remember when I was  
24 reading the analysis of the Browns Ferry fire a long  
25 time ago. They did have spurious actuations there did

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1 they not?

2 MR. WOLFGANG: Yes.

3 MEMBER APOSTOLAKIS: Within 20 minutes I  
4 believe they had all sorts of signals and so on. And  
5 then things started going dead. How does that  
6 experience fit into this?

7 MR. FRUMKIN: I think that experience is  
8 "the long-held staff position" that multiple  
9 simultaneous spurious actuations occur. I think when  
10 you want to point your finger to where we come up with  
11 that, it comes from 1975. It comes from the very  
12 beginning of fire protection regulation is that these  
13 spurious actuations occur.

14 And I think that -- unfortunately the  
15 statements of consideration for Appendix R are short.  
16 You know we have, you know, dozens of pages for a  
17 short NFPA-805 and there may be a dozen pages and a  
18 page maximum for 3(g)(iii) -- for 3(g) of Appendix R.  
19 So we really can't go back in time and pull out the  
20 basis for that. But we have Mark Sallies here, he  
21 might be able to shed some light on that.

22 But I believe that that is the long-held  
23 staff position is the Appendix R fire and these  
24 multiple spurious and rapid succession starting pumps  
25 giving incorrect indication, doing all sorts of

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1 unpleasant things to the plant.

2 CHAIRMAN WALLIS: The incorrect indication  
3 is a big problem. Something has happened and yet you  
4 don't know quite what has happened. That is another  
5 variable altogether from the time. I mean it is the  
6 uncertainty of knowing what is going on which might  
7 lead the operator to do the wrong thing.

8 MEMBER-AT-LARGE SIEBER: Yes, on the other  
9 hand, indications usually either go full scale or to  
10 zero.

11 MEMBER MAYNARD: A lot of times you've got  
12 multiple indications. And that is something they are  
13 trained on quite a bit is on instrument failures.  
14 That said, it is not uncommon to have an instrument  
15 failure without a fire. So they are trained on how to  
16 handle that.

17 MR. FRUMKIN: Right. One of the failure  
18 though they can also get -- and, again, there's  
19 multiple indications, but they could get an indication  
20 of a pump starting when it didn't start. Or a pump in  
21 a start and stop position and then that's going to  
22 take time for them to troubleshoot and whether it was  
23 started or stopped could it be adversely effecting  
24 overfilling the plant or not.

25 There are a number of timing issues that

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1 I'm sure they are trained on. But they can be  
2 potentially challenging.

3 MEMBER DENNING: Continue.

4 MR. WOLFGANG: The NRC letter from Sam  
5 Collins to NEI in 1997 stated that multiple spurious  
6 actuations caused by fire-induced hot shorts must be  
7 considered and evaluated. As I stated earlier, Byron  
8 and Braidwood have SCRs approving the assumption of a  
9 single spurious actuation for a fire event. So if the  
10 staff position is applied to them, it would be  
11 considered compliance backfit.

12 The generic letter --

13 MEMBER-AT-LARGE SIEBER: That's a unique  
14 case, those two plants.

15 MR. WOLFGANG: Yes, correct. The generic  
16 --

17 MEMBER APOSTOLAKIS: But what does that  
18 mean now?

19 MR. WOLFGANG: They are in compliance by  
20 definition.

21 MEMBER APOSTOLAKIS: You would say the SCR  
22 was not correct or what?

23 MR. WOLFGANG: They are in compliance by  
24 definition, right.

25 MEMBER APOSTOLAKIS: But I don't

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1 understand this compliance backfit.

2 CHAIRMAN WALLIS: Compliance by mistake is  
3 what I heard earlier.

4 MR. WOLFGANG: Well, by regulatory  
5 approval.

6 MEMBER APOSTOLAKIS: Can you explain the  
7 parenthesis? If stop position is applied to them, it  
8 would be a compliance backfit. You mean the current  
9 position?

10 MR. WOLFGANG: If they comply with their  
11 SER, the SER is approved even though it was a mistake,  
12 it would be a compliance backfit if we made them  
13 change.

14 MEMBER APOSTOLAKIS: So you would have to  
15 admit then that the SER was not correct?

16 MR. WOLFGANG: We have already admitted  
17 that.

18 MEMBER APOSTOLAKIS: Okay.

19 MEMBER MAYNARD: It is a matter of what  
20 regulatory process is used to actually do it. A lot  
21 fo people think backfit is a bad thing. I think it is  
22 a process that should be used a little bit more rather  
23 than trying to go around a lot of these things. Just  
24 say hey look, we've changed or this is a new  
25 requirement. Here's the regulatory burden. Here is

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1 the increased safety benefit. We are imposing this as  
2 the new requirement for you. It's not necessarily a  
3 bad thing. Just what regulatory burden --

4 MEMBER APOSTOLAKIS: But this doesn't  
5 happen too often, right? I mean --

6 MEMBER DENNING: What? Regulatory  
7 mistakes?

8 MEMBER APOSTOLAKIS: Yes.

9 MEMBER DENNING: Right.

10 CHAIRMAN WALLIS: Well, this last bullet,  
11 I have a lot of problem with. And they must be  
12 considered and evaluated. But it seemed to be very  
13 unclear about to what depth and by what methods these  
14 things must be considered and evaluated. That seems  
15 to be so open-ended that the licensee must be  
16 uncertain what he has to do.

17 MEMBER DENNING: RIS provides more detail  
18 than the generic letter does, right. The 2005 RIS.

19 MR. WOLFGANG: 2005-30?

20 MEMBER DENNING: Yes.

21 MR. WOLFGANG: Not on multiple spurious  
22 actuations, no.

23 MEMBER DENNING: No?

24 MR. WOLFGANG: It doesn't address that.

25 We didn't put that in there because we thought

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1 multiple spurious actuations because of this Byron and  
2 Braidwood SCR could be considered possibly a change in  
3 staff position. So that's why we didn't want to put  
4 it in a RIS.

5 CHAIRMAN WALLIS: There is no regulatory  
6 guide that says how to evaluate multiple spurious  
7 actuations?

8 MR. KLEIN: I think if I could respond to  
9 that question, I'll ask Dan also to pipe in. Is on  
10 page 7 of the generic letter where we do talk about,  
11 you know, ways that licensees can bring themselves  
12 into compliance, there is a discussion in there about  
13 the deterministic methodology or NEI-0001.

14 We do talk about the guidance in there in  
15 Chapter 3. We do say that for post-fire safe-shutdown  
16 circuits in conjunction with the guidance provided in  
17 this generic letter that NEI-0001 is one of the  
18 acceptable approaches to achieve regulatory compliance  
19 with the fire protection requirements for multiple  
20 spurious actuations.

21 So that's one example. And Dan can  
22 correct me if I've overstated this.

23 MR. WOLFGANG: And we say in conjunction  
24 with the guidance provided in this generic letter to  
25 mean consider multiple spurious actuation. I believe

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1 NEI-0001 says to consider two spurious actuations.

2 CHAIRMAN WALLIS: That doesn't mean  
3 anything to me. It could simply mean to say well I  
4 considered it and I think it is irrelevant or  
5 something. I mean what does consider mean? But what  
6 depth? By what methods?

7 MEMBER APOSTOLAKIS: To the depth required  
8 to convince the staff.

9 MEMBER BONACA: That is called open ended.  
10 We could fix it here but it seems to me that, you  
11 know, we do have a problem. And we are trying to  
12 figure out what is the best regulatory process to  
13 solve it. But the problem is there.

14 CHAIRMAN WALLIS: Well, I think we agree  
15 there is a problem. It is just whether or not there  
16 is a mature enough process in place to make something  
17 that is workable happen.

18 MEMBER BONACA: I understand.

19 MEMBER-AT-LARGE SIEBER: Well, this work  
20 has already been done once. The only thing that  
21 changed is the disqualification of certain fire  
22 barriers. All the licensees have done this. And it  
23 should be part of their licensing basis. There should  
24 be plant records as to how they did it the first time.

25 MEMBER DENNING: Really, Jack? I mean

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1 isn't there an issue here of the number of licensees  
2 who thought that they were really dealing with one  
3 spurious actuation requirement? Or one at a time?

4 MEMBER-AT-LARGE SIEBER: I can only speak  
5 to one licensee or about one licensee. And that was  
6 not the assumption.

7 MEMBER DENNING: That was not your  
8 assumption.

9 MEMBER-AT-LARGE SIEBER: No.

10 MEMBER DENNING: No. But there are  
11 licensees out there --

12 MEMBER-AT-LARGE SIEBER: Otto, was that  
13 yours? It is sort of obvious from Browns Ferry that  
14 you get more than one.

15 MEMBER MAYNARD: I'm trying to recall  
16 because the only place where we had different trains  
17 mixing was in the control room so it was primarily a  
18 control room-related issue.

19 MEMBER KRESS: But that is one purpose of  
20 the generic letter to find out the status.

21 MEMBER-AT-LARGE SIEBER: The only time the  
22 number of faults becomes an issue is when you are  
23 trying to solve the problem with operator manual  
24 actions. So now you've got too many things for too  
25 few people to do.

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1           But if you have train separation and the  
2 train separation is effective, you are going to get  
3 some spurious actuations which are going to be  
4 upsetting but not fatal. And you are still going to  
5 maintain a full set of safety equipment that  
6 functions. And that is the object of the fire  
7 protection regulation.

8           MR. KLEIN: I would strongly agree with  
9 what Dr. Sieber just indicated in that the focus here  
10 is on 3(g)(ii) compliance and that is where you've got  
11 the redundant trains in the same fire area as Dan had  
12 indicated. And Dan had indicated some of the history  
13 that, you know, led us up to this.

14           And that had to do with the resolution  
15 that some licensees used to address the thermal lag  
16 issue where they removed some of these fire barriers  
17 and in lieu of meeting the separation requirements of  
18 3(g)(ii), elected to put in place the use of operator  
19 manual actions.

20           And I think that is a very important thing  
21 to kind of keep in mind.

22           MEMBER-AT-LARGE SIEBER: But other  
23 licensees pulled no cable.

24           MR. KLEIN: That is correct. I'm not --

25           MEMBER-AT-LARGE SIEBER: They moved

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1 circuits out of the same fire area.

2 MR. KLEIN: Yes, I'm not suggesting that  
3 all licensees implemented unapproved operator manual  
4 actions in lieu of the requirements of 3(g)(ii).

5 There are other licensees who did plant modifications,  
6 did re-analysis, did re-wraps, pulled cables, what  
7 have you to bring themselves back into compliance with  
8 3(g)(ii).

9 MEMBER-AT-LARGE SIEBER: And some of them  
10 didn't use thermal lag to begin with.

11 MR. KLEIN: That is correct.

12 CHAIRMAN WALLIS: Well, I don't really  
13 have a good understanding of what kind of spurious  
14 actions we are talking about, what kind of operator  
15 actions in response we're talking about, and whether  
16 redundant trains solve the spurious action problem.

17 If I have a fire scenario and it switches  
18 on my high pressure injection, I've got a pump that  
19 runs and it is pouring water into the system, right?  
20 For one thing, I have to know -- I have to diagnose  
21 what is happening. Do I have to send somebody  
22 somewhere to shut a valve? And does that factor have  
23 some redundant train help me at all when something has  
24 been activated spuriously? I mean it is not clear to  
25 me what the range of kind of scenarios is that you are

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1 talking about here.

2 And whether redundant trains always help  
3 you or don't. Maybe they don't help you at all  
4 sometimes. And maybe the operator action sometimes is  
5 so severe that it is very difficult to take.

6 MEMBER MAYNARD: I think in most cases,  
7 there are things they can do. But there are some --  
8 and I think the power operator relief valve is one  
9 that if you have a system where you can't operate the  
10 block valve or the PRE, if it opens you basically have  
11 given yourself a small break.

12 CHAIRMAN WALLIS: That's what I think.  
13 When you think about TMR, they had a false indication  
14 because there was a light which said it was closed  
15 when it was open.

16 MEMBER MAYNARD: But most times you are  
17 still covered by -- I mean you are still analyzed for  
18 a small break LOCA or for the other events. A pump  
19 coming on, there are multiple ways to turn pumps off.  
20 And you are not going to be injecting water at such a  
21 rate that you have, you know -- I'm kind of talking  
22 more PWR than I am BWN here so I --

23 MEMBER DENNING: But it is those things  
24 though -- it is the multiplicity of those things that  
25 boggles my mind. You know rather than train

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1 separation and train protection which you talked  
2 about, it just seems like there is such a multiplicity  
3 of potential things and trying to analyze all those  
4 things seems almost open ended.

5 MEMBER-AT-LARGE SIEBER: There aren't --  
6 in sheer numbers, there aren't all that many safety  
7 circuits. And if you go underneath the control room  
8 into the faucet rafter, you'll find loads of jumpers  
9 and knife switches and things like that where you can  
10 de-energize control circuits.

11 Now one of the problems is that it  
12 actually, in a lot of circuit breakers, it takes power  
13 to trip it, you know. The trip coil requires  
14 energization so pulling a knife switch doesn't  
15 guarantee that it will run forever. And so the  
16 operator really has to understand how the control  
17 system is set up to be able to do that.

18 But there are ways to overcome these  
19 problems that don't require excursions all over the  
20 plant. And on the other hand, the plant is designed  
21 to be safe provided that you have a functional safety  
22 train. Separation criteria, if rigidly applied,  
23 provides that independent safety train.

24 MEMBER DENNING: We are going to now take  
25 our break until 20 after 10. And then we will have to

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1 move surprisingly quickly after that.

2 CHAIRMAN WALLIS: Okay. So we're going to  
3 take a break until 20 past 10.

4 (Whereupon, the foregoing matter went off  
5 the record at 10:09 a.m. and went back on the record  
6 at 10:23 a.m.)

7 CHAIRMAN WALLIS: Rich, would you resume  
8 the management of the meeting, please?

9 MEMBER DENNING: Please proceed.

10 MR. WOLFGANG: Okay. The last issue,  
11 clarifying the generic letter, the point we have here  
12 is the staff position on multiple spurious actuations  
13 presented in the generic letter is consistent with  
14 section 9.5.1 of the standard review plan.

15 Public comments. The significant public  
16 comment was that the generic letter constituted a  
17 backfit to licensees. And we addressed this comment.  
18 We obtained CRGR approval to issue this generic  
19 letter. And, as I said earlier, only for Byron and  
20 Braidwood, who have approved SERs that we know of,  
21 would this constitute a backfit.

22 Basically, this generic letter is just a  
23 request for information.

24 MEMBER MAYNARD: I would challenge that.

25 MR. WOLFGANG: Yes. I think --

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1                   MEMBER MAYNARD: That's all right. We'll  
2 comment on that.

3                   CHAIRMAN WALLIS: It isn't just a request  
4 for information. It asks them to do a lot of things.

5                   MEMBER MAYNARD: Yes. That is what I  
6 challenge, that statement. Yes. We've talked about  
7 it.

8                   CHAIRMAN WALLIS: That was what I was  
9 uncertain about.

10                  MEMBER DENNING: Why don't you go ahead  
11 and summarize, even though we're going to have a  
12 couple of other things? Why don't you go ahead and  
13 summarize? Then there are a couple of other things we  
14 would like you to -- we have more than started. We're  
15 almost done.

16                  MR. WOLFGANG: A summary. The generic  
17 letter, as I said before, is a request for information  
18 from licensees. The industry cable fire test program  
19 reaffirmed the staff interpretation of the regulatory  
20 requirements concerning multiple spurious actuations  
21 must be considered in the circuits analysis. The  
22 generic letter is necessary to ensure that all  
23 risk-significant circuit situations are identified and  
24 addressed.

25                  CHAIRMAN WALLIS: Could you go back a bit

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1 and say something about why this came about? I mean,  
2 wasn't this something to do with this thermal lag  
3 business? All of these installations, like Hemmicks  
4 and Eastern, every time we look at them --

5 MR. WOLFGANG: Yes.

6 CHAIRMAN WALLIS: Well, isn't that the  
7 solution would be to have a proper barrier around  
8 these things?

9 MR. WOLFGANG: That's one solution, yes.

10 MEMBER DENNING: I don't see that as a  
11 total solution. I don't --

12 MR. WOLFGANG: That is one solution.  
13 Another solution is a separation, 20-foot separation.

14 CHAIRMAN WALLIS: But in the past, when we  
15 believed that this thermal lag worked, there wasn't a  
16 problem. Is that right?

17 MEMBER MAYNARD: No. I think the problem  
18 was still there then. This has been bounced around  
19 since I know at least the early '80s as an issue. I  
20 think the thermal lag, it helped in some cases where  
21 you could show separation in the trains, but it  
22 doesn't necessarily take care of you if you've got  
23 cables in the same area that are --

24 MEMBER DENNING: Right. They can still  
25 give you spurious actuation, regardless.

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1 MEMBER MAYNARD: Right.

2 MEMBER DENNING: Now, it may be -- do you  
3 have any comments on that?

4 MR. FRUMKIN: Yes. If you have the  
5 separation, you can still get spurious actuations.  
6 And that's a box that we're not in with the rule. The  
7 rule does not require that those be protected. So all  
8 plants have the flexibility for the unprotected train  
9 to mitigate through feasible and reliable manual  
10 actions those types of spurious actuations.

11 Now, if you were to get a spurious  
12 actuation that were to give you all incorrect  
13 indication and was not recoverable, then that would  
14 still have to be resolved because it would be a  
15 potential safety issue. But for the minor ones that  
16 we have been talking about that would be fairly easy  
17 to resolve through a manual operator action or there  
18 are procedural controls or something of that nature,  
19 that would not be a compliance issue per se.

20 MEMBER DENNING: Help me with that because  
21 I still don't quite understand it. So if you have a  
22 protected train and you get a spurious actuation from  
23 an unprotected train, then you have to analyze all  
24 combinations of spurious actuations still, don't you,  
25 that are possible in that unprotected train?

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1 MR. FRUMKIN: Alex, do you want to?

2 MR. KLEIN: Yes, I believe you do because  
3 the over-arching requirement of appendix R is to be  
4 able to safely bring your plant to safe shutdown. And  
5 if you don't know what's occurring in your plant, then  
6 you can't meet that over-arching high-level goal of  
7 achieving and maintaining safe shutdown of your plant.

8 MR. FRUMKIN: And I will just say that  
9 once you have your protective train, your protected  
10 train, your unprotected train has a very limited set  
11 of things that could hurt you.

12 Now, we're talking we have plenty of  
13 water. We have plenty of indication. We have plenty  
14 of everything. But now we might open, we might cause  
15 a drain letdown path to open or we might cause a pump  
16 to start, but we should be getting clear indication of  
17 that in the control room. And in the normal  
18 procedure, process, you'll be getting indication of  
19 these things happening. And they should be able to  
20 mitigate them fairly effectively.

21 Now, there may be some things that would  
22 be difficult to mitigate. And, as Alex says, they  
23 have to find those and find a way to mitigate them.

24 MEMBER DENNING: So you have lots of  
25 things you have to analyze, but the mitigation of it

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1 is probably not too severe for the plant, and the  
2 plant is allowed to do manual action on it.

3 Now, there is another set here. So what  
4 is the other set? Aren't you always required to have  
5 a protected train?

6 MR. FRUMKIN: Yes. And these plants don't  
7 have that protected train. In effect, all circuit and  
8 manual action findings or potential violations are  
9 lack of protection, lack of circuit protection.

10 MEMBER DENNING: Circuit separation.

11 MR. FRUMKIN: So when --

12 MEMBER DENNING: Separation of the --

13 MR. FRUMKIN: Right. So when a finding  
14 comes in, let's say we have that hypothetical finding,  
15 which opens up and drains down the RWST. The citation  
16 is going to be against 3G2, lack of separation and  
17 lack of protection.

18 Now, we don't require one protection  
19 method over another, but they didn't put a protection  
20 method in there to protect the -- well, RWST is a bad  
21 example because it is not a necessarily one-train  
22 system.

23 But let's say you have both trains being  
24 affected by a fire. And here this is probably what is  
25 the more likely scenario. One train is just going to

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1 be damaged by the fire and not work, and then the  
2 other train is going to have the spurious actuation.

3 We don't necessarily need both trains to  
4 have spurious actuations. So that's the situation.  
5 It doesn't have to be multiple spurious on multiple  
6 trains.

7 MEMBER APOSTOLAKIS: Have we agreed that  
8 the first bullet is not quite correct? We're asking  
9 for more than just information?

10 MR. FRUMKIN: It's clear.

11 MEMBER APOSTOLAKIS: Yes.

12 MEMBER DENNING: It just takes them a lot  
13 of work to do it. I think we all recognize that it's  
14 a request for information, but in order to produce  
15 that information, you have to do a lot of work.

16 MEMBER APOSTOLAKIS: Right. It sounds to  
17 me like the priest saying, you know, "I know you're a  
18 sinner, George. Now, you go away and think of all the  
19 ways in which you could be a sinner and come back and  
20 tell me what they are." I have thought about it.

21 CHAIRMAN WALLIS: It's already been  
22 analyzed.

23 MEMBER APOSTOLAKIS: I protected myself.

24 MEMBER DENNING: Let's go on. And I would  
25 like to hear the conservative risk analysis. And so

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1 would you give us a little presentation on the  
2 conservative risk analysis?

3 MR. FRUMKIN: Are you done with all of  
4 your slides?

5 MEMBER DENNING: Yes.

6 MR. WOLFGANG: Yes. I just want to say  
7 one thing. If we don't issue a generic letter, we'll  
8 have to use the inspection process behind these  
9 problems.

10 It will take longer. We estimate three  
11 triennials, nine years. And some risk-significant  
12 items may be missed. We don't know because the burden  
13 is put on us, instead of the licensee. I just want to  
14 bring it up.

15 MEMBER DENNING: Thank you.

16 MEMBER BONACA: Is it with regard to the  
17 90 days with the responses? I mean, how did you come  
18 up with the 90 days, recognizing that you have to go  
19 to award to provide these responses? Was there an  
20 evaluation that you performed?

21 MR. WOLFGANG: No.

22 MEMBER BONACA: I mean, can it be changed?

23 MR. WOLFGANG: It can be changed. It was  
24 an arbitrary period that we thought was --

25 MEMBER APOSTOLAKIS: Or you can reduce the

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1 requirement.

2 MR. WOLFGANG: Yes, or we can --

3 MEMBER APOSTOLAKIS: So we don't have  
4 these?

5 MR. FRUMKIN: No, you don't have these  
6 slides. We will be making them available.

7 MR. KLEIN: Just as a reminder, if I can  
8 just follow up on the 90-day issue and the comments in  
9 regard to that, we do have a bullet in there that, for  
10 licensees who can't meet that 90-day requirement, that  
11 within the 30 days, they come in and request an  
12 extension.

13 MEMBER MAYNARD: Yes. And I saw that in  
14 the generic letter. If it's a situation where you  
15 know 90 percent of the industry is not going to be  
16 able to do it, you might as well be able to pick a  
17 date where everybody is not having to do it. I'll be  
18 interested in hearing from the industry as to whether  
19 they think that is a burden or not. I think I am  
20 assuming it is, but it may not be. So I don't know.

21 MR. FRUMKIN: This is a bounding risk  
22 analysis for multiple spurious actuations. It was  
23 developed for this meeting by Ray Gallucci, Dr. Ray  
24 Gallucci, who is in the Fire Protection Section. And  
25 it's been presented as a paper for the American

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1 Nuclear Society presentation. I think this winter  
2 they're having a meeting.

3 I am the third string presenter of this  
4 document. Ray is the first string. Dr. Weerakkody is  
5 the second string. And I'm presenting out of  
6 necessity.

7 MEMBER DENNING: Is Ray here to get beaten  
8 upon if he --

9 MR. FRUMKIN: No. Ray is on inspection at  
10 Browns Ferry. So we have --

11 MEMBER APOSTOLAKIS: Last time he was here  
12 he --

13 MEMBER DENNING: No wonder he's at Browns  
14 Ferry.

15 MR. KLEIN: Let me clarify. He's on a  
16 program review at Browns Ferry. He's not on an  
17 inspection.

18 MR. FRUMKIN: Okay. I'm sorry. These  
19 slides will be made available. My understanding of  
20 this analysis is using an older plant PRA that Ray was  
21 involved in, he pulled out some of the important  
22 measures for some hot shorts. And he recombined them  
23 into multiple hot shots and, using a simplification  
24 process, determined a bounding risk analysis for those  
25 based on those important measures for one plant's PSA.

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1           So this is the typical older nuclear power  
2 plant, has a fire CDF of  $3.3^{-5}$ . And they used a hot  
3 short probability of .1. They had modeled 24 of the  
4 basic events. And that contributed about 5 percent to  
5 the fire CDF or  $1.8D^{-6}$ .

6           And then there were some systematically  
7 symmetric redundant train components that were chosen  
8 because I think they had more of a larger impact on  
9 the plant risk if they were to fail together. And  
10 that was a contribution of .03 to the fire CDF, those  
11 10 items.

12           MEMBER DENNING: Let's go slowly so we --

13           MEMBER APOSTOLAKIS: Yes.

14           MEMBER DENNING: -- understand what we  
15 have here.

16           MR. FRUMKIN: Okay.

17           MEMBER APOSTOLAKIS: Twenty-four hot short  
18 basic events above truncation. What does that mean?

19           MR. FRUMKIN: That in the model, the ones  
20 that had remained as important remained having  
21 importance measures in the model, that there were only  
22 24 hot shorts that remained there.

23           MEMBER APOSTOLAKIS: The core damage  
24 frequency due to hot shorts is  $1.8 \cdot 10^{-6}$  per year, it  
25 says.

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1 MR. FRUMKIN: Correct, assuming a hot  
2 short probability of .1.

3 MEMBER APOSTOLAKIS: Which was low.

4 MR. FRUMKIN: Which is low based on  
5 current data.

6 MEMBER KRESS: Okay. So one, it would be  
7 1.8 times  $10^{-5}$ .

8 MR. FRUMKIN: If you said 1.0, correct.

9 MEMBER DENNING: Now, you said that that's  
10 low, but don't forget here that now we're talking  
11 supposedly real nuclear power plants with fires where  
12 you would take into account the fact that the fire may  
13 not damage any cables, you know.

14 MR. FRUMKIN: Right. Well, this is from  
15 an --

16 MEMBER DENNING: Oh, this is --

17 MR. FRUMKIN: -- old fire PSA. So this  
18 does consider --

19 MEMBER DENNING: Yes, it does.

20 MR. FRUMKIN: -- many of those factors.

21 MEMBER DENNING: But saying that the  
22 probability of your hot short is .1 and saying, "Well,  
23 that is low," I think because we saw those other  
24 things where people say, "Well, it could be .6 or .2  
25 or something like that," --

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1 MR. FRUMKIN: Right.

2 MEMBER DENNING: -- and, therefore, this  
3 is low, that doesn't necessarily follow.

4 MR. FRUMKIN: I think this is the  
5 conditional hot short probability based on cable  
6 damage.

7 CHAIRMAN WALLIS: How about multiple  
8 shorts come into this?

9 MR. FRUMKIN: That is what we are going to  
10 be talking about.

11 CHAIRMAN WALLIS: This doesn't address  
12 that?

13 MR. FRUMKIN: No, no. Right. This is  
14 what this analysis is. So assuming that the  
15 components within each pair -- these are those ten  
16 items that have been paired -- have similar failure  
17 characteristics and locations, including their cable  
18 runs, again, this is a conservative assumption and  
19 that these comprise the full set of candidates for  
20 multiple spurious actuations that are not specifically  
21 modeled in the traditional IPEEEs as --

22 MEMBER APOSTOLAKIS: The number you showed  
23 us earlier assumes that these happen independently?

24 MR. FRUMKIN: Yes.

25 MEMBER DENNING: You know, I still don't

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1 understand the pairing. What is going on here? Is it  
2 ten corresponding to --

3 MEMBER APOSTOLAKIS: Ten of these?

4 MEMBER DENNING: Five paired components.

5 That means that there is a --

6 MEMBER APOSTOLAKIS: Redundant elements.

7 MEMBER DENNING: They're redundant  
8 elements.

9 MEMBER APOSTOLAKIS: Yes.

10 MR. FRUMKIN: I believe what they did is  
11 of these 24, they took out 10 of them that could when  
12 combined have an issue.

13 MEMBER APOSTOLAKIS: They are still  
14 located in the --

15 MEMBER DENNING: It could lead to  
16 problems.

17 MR. FRUMKIN: On this slide, they're  
18 independent.

19 MEMBER APOSTOLAKIS: Yes.

20 MR. FRUMKIN: But I think what we're going  
21 to do is we're going to try to take out that and look  
22 at them as pairs. So this is what we're going to do,  
23 form a bounding analysis to estimate the potential  
24 maximum CDF due to multiple spurious actuations for  
25 this typical older MPP, which I think is what the

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1 target, the goal is here.

2 And now we start getting into some  
3 formulas. Per pair, one hot short corresponds to  
4 train A and the other to train B. So that's how they  
5 were paired. And they appear in symmetrically paired  
6 cut sets.

7 So one cut set, the CDF of A -- and  
8 there's the formula for that -- and the CDF of B,  
9 which is the fire initiator, and then the hot short or  
10 random failure of one of the paired components and  
11 then the summation of the B. Okay?

12 CHAIRMAN WALLIS: And where do the  
13 multiple shorts come in?

14 MR. FRUMKIN: This is the formula for --

15 CHAIRMAN WALLIS: It's between two trains,  
16 but it's not multiple shorts in the same cable.

17 MR. FRUMKIN: That's correct, not in the  
18 same cable.

19 CHAIRMAN WALLIS: It's still independent.  
20 And this formula that you have here, the cut sets, are  
21 still assuming that the --

22 MR. FRUMKIN: I think so. They're not  
23 going to be independent of the same fire and the same  
24 damage time, but they're going to be independent  
25 failures affected by the same fire.

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1 MEMBER APOSTOLAKIS: Conditional on the  
2 fire.

3 MR. FRUMKIN: Conditional on the fire.

4 MEMBER SIEBER: Which assumes the fire  
5 covers both things.

6 MR. FRUMKIN: Right, which is a  
7 conservative assumption in this analysis.

8 MEMBER SIEBER: Truly conservative.

9 MR. FRUMKIN: Yes.

10 MEMBER SIEBER: Improbable.

11 MR. FRUMKIN: Well, it depends on the  
12 design of the plant, but yes, it's --

13 MEMBER APOSTOLAKIS: So if I want to  
14 couple them, then, I will assume that Fa and Fb are  
15 just F, one fire. Is that correct? And then I will  
16 have --

17 MEMBER DENNING: A is --

18 MEMBER APOSTOLAKIS: Otherwise they are  
19 still independent. I mean, the fire initiator must be  
20 the same.

21 MR. FRUMKIN: Well, let's just hope that  
22 your answer --

23 MEMBER APOSTOLAKIS: We assume two  
24 different fires.

25 MEMBER DENNING: We'll go to the next

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1 slide. And maybe it will become clear.

2 MEMBER SIEBER: It's a lot clearer in  
3 here.

4 MR. FRUMKIN: Okay. So, again, we have --

5 MEMBER APOSTOLAKIS: This .1 comes from?

6 MR. FRUMKIN: The .1 was the  
7 state-of-the-art when they did this PSA of --

8 MEMBER APOSTOLAKIS: I'll tell you where  
9 it comes from.

10 MR. FRUMKIN: Okay.

11 MEMBER APOSTOLAKIS: That's 20 years or so  
12 ago.

13 MEMBER DENNING: You're responsible for  
14 .1?

15 MEMBER APOSTOLAKIS: I saw it, and I said,  
16 "Well, gee. How did you come up with that?"

17 So they said, "Well, call this guy"  
18 somewhere in California.

19 I called this guy. He says, "Well, you  
20 know Sandia told us that."

21 "What Sandia?"

22 "This person."

23 So I called this person in Sandia. He  
24 says, "Well, I really don't know. It's this other  
25 guy."

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1           So I called this other guy. And he says,  
2 "You told us that."

3           (Laughter.)

4           MEMBER DENNING: So we're going to accept  
5 the .1.

6           MEMBER APOSTOLAKIS: It wasn't followed up  
7 at all. I mean, that was the funniest thing.

8           MR. FRUMKIN: The IPEEE assumed this hot  
9 short probability of .1. And then I believe we're  
10 doing a simplification of these factors here. And it  
11 actually gets very simple on the next slide, but if  
12 anyone really wants me to read through this, I can  
13 try.

14           MEMBER DENNING: You know what we'll do?  
15 Let's go to the bottom line.

16           MR. FRUMKIN: The bottom line.

17           MEMBER DENNING: And we'll have copies of  
18 this.

19           MR. FRUMKIN: Okay. Yes.

20           MEMBER DENNING: And we'll --

21           MR. FRUMKIN: Okay. This is, I believe --  
22 well, let's see.

23           MEMBER APOSTOLAKIS: No. This is --

24           MR. FRUMKIN: This is the bottom line  
25 here.

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1 MEMBER APOSTOLAKIS: Go back a little bit.

2 MR. FRUMKIN: I think --

3 MEMBER APOSTOLAKIS: This Fa plus Fb I  
4 don't understand. I thought it was going to be 1.5.

5 CHAIRMAN WALLIS: That's two fires, isn't  
6 it?

7 MEMBER APOSTOLAKIS: This is one or the  
8 other, yes, one or the other.

9 MR. FRUMKIN: Yes.

10 MEMBER APOSTOLAKIS: It doesn't really --  
11 I mean, he should have assumed one fire as far as I  
12 can tell. But, again, the --

13 MEMBER DENNING: We will look at it  
14 carefully.

15 MEMBER APOSTOLAKIS: -- connection is  
16 nothing, I mean, right?

17 MEMBER DENNING: We will look at it  
18 carefully later.

19 MR. FRUMKIN: Right. That would be a  
20 small difference.

21 MEMBER DENNING: And Ray's bottom line  
22 again is?

23 MR. FRUMKIN: Okay. Well, what he does  
24 here is he's taking out the  $1.1E^{-6}$ . And he's putting  
25 in this value or coming up with this value of .011,

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1 which is his surrogate simplification for all of the  
2 fires and his X factor, which is his fire and his  
3 failure factor.

4 MEMBER APOSTOLAKIS: He's bounding the  
5 random failures, right, by assuming a  $10^{-3}$ , right?

6 MR. FRUMKIN: I believe so.

7 MEMBER APOSTOLAKIS: Yes.

8 MR. FRUMKIN: Typical, right.

9 MEMBER APOSTOLAKIS: But he doesn't know  
10 how many -- oh, this is a bound on all random failures  
11 that are required.

12 MR. FRUMKIN: Yes.

13 MEMBER DENNING: Continue. Let's see.

14 MR. FRUMKIN: Okay. And now he's talking  
15 about the dual failures. Any of the ten paired hot  
16 shorts would appear in the cut sets. And  $F_a$  is the S,  
17 which is your severity factor, which going to reduce  
18 your likelihood of more hot shorts, which is the  
19 likelihood of having a big fire that's going to cause  
20 this damage.

21 CHAIRMAN WALLIS: Which affects both  
22 trains?

23 MR. FRUMKIN: Right. And then your  
24 various factors, A hot, B hot short, and then your  
25 random factors.

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1 MEMBER APOSTOLAKIS: Why square? Why A  
2 hot times A hot? It still assumes that they're  
3 independent events, right?

4 CHAIRMAN WALLIS: Well, that is the A hot  
5 times B hot --

6 MEMBER DENNING: It is going to take us  
7 some time to really work through this. Rather than do  
8 this here, --

9 MR. FRUMKIN: Okay.

10 MEMBER DENNING: -- let's go see Ray's  
11 bottom line.

12 MR. FRUMKIN: Okay. The bottom line is  
13 here.

14 MEMBER APOSTOLAKIS: All right.

15 MR. FRUMKIN: So for his choice of fires,  
16 for severity factor, I think he used a .1 for this  
17 extreme fire, which is an S.

18 CHAIRMAN WALLIS: Why is .1 extreme? It  
19 could be .5.

20 MR. FRUMKIN: Oh, no, no, no. This is for  
21 the likelihood of a large fire.

22 CHAIRMAN WALLIS: Yes. But just asking  
23 George Apostolakis by telephone tag --

24 MR. FRUMKIN: Oh, no. This is not his .1.

25 CHAIRMAN WALLIS: I thought it was his .1.

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1 MR. FRUMKIN: It's somebody else's .1.

2 MEMBER APOSTOLAKIS: This is from one of  
3 my students.

4 MR. FRUMKIN: That's right. Right. This  
5 .1 is from very likely the fire protection STP, which  
6 says that severe fires happen or ten percent of all  
7 fires that happen are severe, which is, again, a  
8 conservative number based on the state-of-the-art,  
9 which is the 6850 analysis.

10 But that's what we're doing with -- I  
11 mean, this is no question about it. This is a  
12 bounding analysis.

13 CHAIRMAN WALLIS: The ones that cause hot  
14 shorts?

15 MR. FRUMKIN: No. Instead of using a  
16 severity factor of one, assuming that all fires will  
17 cause the damage, we're only assuming that ten percent  
18 of the fires will cause the damage to cause hot short.  
19 So there are many different ways of severity --

20 MEMBER APOSTOLAKIS: So this .011, .011,  
21 is the frequency of fire or, no, this is from the  
22 random failure?

23 MR. FRUMKIN: Right.

24 MEMBER APOSTOLAKIS: According to one is  
25 one?

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1 MR. FRUMKIN: That's the severity factor.

2 MEMBER APOSTOLAKIS: What is the frequency  
3 of fire?

4 MR. FRUMKIN: What I believe he has done  
5 is I believe he has back-calculated through his  
6 simplification that .1 that he used. And he's turned  
7 that, the whole -- all of his important measures into  
8 this .011.

9 MEMBER APOSTOLAKIS: So that includes the  
10 frequency of fire?

11 MR. FRUMKIN: I believe so.

12 MEMBER APOSTOLAKIS: That's a pretty high  
13 number.

14 MR. FRUMKIN: Yes.

15 MEMBER DENNING: We are going to look at  
16 this carefully, but his bottom line is saying, well,  
17 what this could do in this particular case is it could  
18 have increased by a factor of three the fire damage  
19 frequency.

20 MR. FRUMKIN: I think what he's trying to  
21 say here is that when he back-calculates from his  
22 importance measures and then he combines these pairs,  
23 that -- and this is the bottom line here -- he can  
24 have a maximum of  $10^{-4}$  per year due to these pairs of  
25 hot shorts.

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1 MEMBER DENNING: And without it, they had  
2 3 times  $10^{-5}$  is what this plant did.

3 MR. FRUMKIN: Yes. That's the whole fire  
4 risk for the plant, is 3 times  $10^{-5}$ . So this could be  
5 dominating.

6 MEMBER APOSTOLAKIS: But why couldn't you  
7 go to an actual PRA and fix, instead of whatever they  
8 had, and see what happens, rather than doing this  
9 undue analysis? I mean, there are detailed fire PRAs  
10 out there.

11 MR. FRUMKIN: We don't actually have one  
12 in the office. He did have this information available  
13 to him.

14 MEMBER DENNING: What I would like to do  
15 is we would definitely like copies. Don't go  
16 anywhere.

17 MR. FRUMKIN: Okay.

18 MEMBER DENNING: And I don't think you  
19 have to read that. What we would like -- I mean, you  
20 can actually --

21 MR. FRUMKIN: Well, here his last slide is  
22 at least for a typical older nuclear power plant, one  
23 cannot a priori dismiss multiple hot shorts of being  
24 of lower significance.

25 MEMBER DENNING: Okay.

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1 MEMBER APOSTOLAKIS: Well, I would like to  
2 see the paper, please. No, no. Give me a copy.

3 MEMBER DENNING: Right. Yes, if we may.  
4 What we would like to do now is we would like to hear  
5 now from NEI, if we could. Don't run away, Research.

6 MEMBER APOSTOLAKIS: Don't anybody go  
7 away.

8 MEMBER DENNING: Don't anybody leave town  
9 other than me, but I would definitely like to make  
10 sure we have plenty of time to hear from NEI.

11 MEMBER APOSTOLAKIS: That's what I call  
12 running and meeting with --

13 MEMBER DENNING: The policeman is asked to  
14 lock the doors.

15 MEMBER APOSTOLAKIS: We have a cop  
16 outside?

17 MEMBER DENNING: And, Alex, you don't have  
18 handouts, but we can make them. Is that a true  
19 statement?

20 MR. MARRION: No, I do not have handouts.  
21 I do have a couple of comments.

22 MEMBER DENNING: You have comments?

23 MR. MARRION: Yes.

24 MEMBER DENNING: But you don't have any  
25 papers?

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1 MR. MARRION: No.

2 MEMBER DENNING: Okay. Please proceed.

3 MR. MARRION: Good morning. My name is  
4 Alex Marrion. I am a Senior Director of Engineering  
5 at NEI, and I appreciate the opportunity to offer a  
6 couple of comments on our perspectives on what we  
7 heard this morning.

8 Before I begin, I want to point out that  
9 we have two utility representatives, one from Progress  
10 Energy and one from Duke Power, who represent the two  
11 pilot plants for the application of NFPA 805.

12 And if the Committee so desires, I think  
13 it may be useful for you to understand the  
14 implications of this generic letter on the NFPA 805  
15 risk-informed application process. And I'll defer to  
16 you to --

17 MEMBER DENNING: We so desire.

18 MR. MARRION: Okay. Very good. Now I'll  
19 ask them to step up when I finish my comments.

20 To get back to Dr. Apostolakis' --  
21 George's comment, --

22 (Laughter.)

23 MR. MARRION: -- the test protocol and the  
24 issue of having cables exposed in the flaming region,  
25 I don't have any direct knowledge of that discussion

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1 with the NRC staff at the time we developed the test  
2 protocol. This was the first I heard of it, but I'll  
3 look into it. And we'll try to get an answer to you  
4 at the end of the week.

5 I do want to make it clear that we believe  
6 the multiple spurious actuation is a new regulatory  
7 position that results in significant impact on utility  
8 licensees, not only on the Appendix R, the NUREG 0800  
9 plants but also on the NFPA 805 plants.

10 The impact is significant in that it  
11 changes the methodologies that the utilities have  
12 credited in their licensing basis over the last 20  
13 years. So the licensing basis has to change.

14 Now, with that, it's perfectly appropriate  
15 for the NRC to say, "There's new information that has  
16 been brought to bear on this topic. And we have a new  
17 position." That's fine. But the NRC must bear the  
18 burden of demonstrating the safety impact of that new  
19 position and do a regulatory analysis to substantiate  
20 it because of the significant implications on the  
21 utility licensee design basis.

22 That's straightforward, but one thing that  
23 this position does not take into account is the  
24 fundamental elements of defense-in-depth relative to  
25 fire protection. What I'm talking about is the

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1 actions that are taken by licensees in preventing  
2 fires from occurring and detecting a fire when it does  
3 occur, having systems and personnel to respond to the  
4 fire to mitigate the consequences of the fire,  
5 suppression and detection systems, and then ultimately  
6 recovering the plant to assure that you can get into  
7 a safe condition.

8 We understand there is value to looking at  
9 risk-informed approaches and changes and assumptions  
10 and evaluating them accordingly, but I would recommend  
11 that we not lose sight of the defense-in-depth  
12 concepts as we go through this process going forward.

13 This generic letter is another example of  
14 what is fundamentally flawed with fire protection  
15 regulations and has been a problem with fire  
16 protection regulations and the associated regulatory  
17 process over the last 25 or 35 years.

18 And by that, I mean we have a continuous  
19 evolution of NRC positions and expectations that are  
20 addressed in a somewhat informal manner. And by that,  
21 I mean use of generic communications to articulate  
22 regulatory positions is, quite frankly, inappropriate.

23 New regulatory positions should be  
24 evaluated in terms of safety impact or clearly  
25 demonstrating the compliance issue associated with

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1 that new position. Then that has to be made publicly  
2 available so that the licensees can understand what  
3 these new positions are and what the basis for the  
4 positions are.

5 Historically in fire protection, it's been  
6 a plant-specific fire protection engineer from the  
7 licensee to an NRC inspector agreement of what the  
8 understanding is relative to an interpretation. And  
9 that is the problem that we're trying to fix. That's  
10 why we are so firm in our comments going forward,  
11 because fundamentally, gentlemen, if we don't address  
12 or we don't identify resolution to the spurious  
13 actuation issue today, it will be an issue for the  
14 NFPA 805 plants.

15 Going to 805 does not provide a resolution  
16 to this issue today because there is no understood  
17 methodology that can address the staff's position. I  
18 want to make that very clear.

19 MEMBER APOSTOLAKIS: Is this the  
20 open-ended issue that we discussed earlier?

21 MR. MARRION: Yes, yes. The comments made  
22 about CRGR approval of this generic letter, as an  
23 external stakeholder, that essentially is meaningless  
24 to us, reason being we are not privy to any kind of  
25 disciplined process that is used by CRGR or anyone

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1 within the NRC that clearly demonstrates this is the  
2 basis for the safety concern or this is the basis for  
3 the compliance concern.

4 What we have seen over the years -- and  
5 this is another example -- where the preferred route  
6 appears to be, well, let's make it a compliance  
7 concern because we as a regulatory agency, the NRC,  
8 can interpret the regulations. We have the right to  
9 interpret the regulations, et cetera, which is fine,  
10 but let's put the interpretation on paper. Let's  
11 identify resolution path so we have a common  
12 understanding going forward. We don't have that today  
13 on this particular issue.

14 Lastly, I would like to say that there  
15 isn't a generic letter that is simply a request for  
16 information. It should be clear from the discussion  
17 this morning that this generic letter basically  
18 imposes a new regulatory requirement that has  
19 significant impact on the licensing basis of current  
20 plants. That is not a request for information.

21 Those are the comments that I wanted to  
22 make this morning. I don't know if you have any  
23 questions on anything I said.

24 MEMBER DENNING: Yes, we do have some.  
25 One of them has to do with the timing, the 90 days,

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1 and the timing required to do the kind of analysis  
2 that's being requested there. Do you have a feeling  
3 as to what an appropriate time would be?

4 I mean, there's a timing that says, are  
5 you in compliance with this, which, regardless of this  
6 question, whether it's a new regulation or an old,  
7 there's no question the plant can determine that  
8 fairly quickly. But doing the entire analysis and  
9 determining what affected SSCs are, do you have any  
10 indication from the plants as to how much time that  
11 might take and what an appropriate time frame would be  
12 for a response like --

13 MR. MARRION: I don't have the information  
14 to answer the question, but I would submit that the  
15 next two individuals may be able --

16 MEMBER DENNING: May be of help on it?

17 MR. MARRION: -- to give you their  
18 perspectives.

19 MEMBER DENNING: Okay. Good.

20 MEMBER MAYNARD: Could I just --

21 MEMBER DENNING: Yes?

22 MEMBER MAYNARD: Your perspective comment  
23 was made that if the generic letter is not issued,  
24 then it would just have to be dealt with in inspection  
25 space. Do you have any comment on that?

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1 MR. MARRION: It is being dealt with in  
2 inspection space. Now, what we don't have is an  
3 external stakeholder. When I mention "we," I'm  
4 speaking of NEI and the industry. What is the safety  
5 case or what is the compliance case? And we haven't  
6 seen evidence of that clearly demonstrated that NRC  
7 action in this particular area is necessary in an  
8 expedited manner.

9 VICE CHAIRMAN SHACK: Just to address your  
10 methodology question, apparently you can deal with  
11 multiple actions if they come sequentially. So you  
12 have a methodology for that. And you're arguing that  
13 there isn't a methodology.

14 So it isn't necessarily the open-endedness  
15 of it that's the problem?

16 MR. MARRION: There isn't a methodology  
17 for addressing all spurious actuations in a given  
18 fire. Utilities had --

19 VICE CHAIRMAN SHACK: You can address them  
20 one at a time.

21 MR. MARRION: You can address them one at  
22 a time. And I would ask that the two utility  
23 representatives explain their methodology for circuit  
24 analysis. I think we would find that very insightful.

25 MEMBER DENNING: Good.

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1 MR. MARRION: But it's changed. And then  
2 what I would like to do is ask Dave Miskiewicz from  
3 Progress Energy and Harry Barrett from Duke Power.

4 CHAIRMAN WALLIS: I would bring up the  
5 point before you leave --

6 MR. MARRION: Yes?

7 CHAIRMAN WALLIS: You talked about the  
8 role of a generic letter and whether it just requests  
9 information. We have another generic letter on sumps,  
10 which you may be aware of, right?

11 MR. MARRION: I am generally aware of that  
12 one.

13 CHAIRMAN WALLIS: It not only requested  
14 information. It requested analysis, and it requested  
15 plans. And, in fact, it's resulted in large changes  
16 in the plant by a result of a generic letter.

17 MR. MARRION: Yes.

18 CHAIRMAN WALLIS: So it's not as if this  
19 is a unique generic letter, which is actually asking  
20 plants to do much more than just supply information.

21 MR. MARRION: My only point is a request  
22 for information as this generic letter is  
23 characterized as a mischaracterization of what its  
24 impact is.

25 CHAIRMAN WALLIS: Well, it clearly isn't

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1 that. I mean, it says a request for information and  
2 taking additional actions. I mean, the sentence asks  
3 for more than just information.

4 MR. MARRION: Okay?

5 MEMBER DENNING: Okay. Let's have our  
6 visitors come up.

7 MR. FRUMKIN: If I could add? This is Dan  
8 Frumkin. Just one point. The inspections started  
9 again in January of 2005, but there is still currently  
10 enforcement discretion for all circuit findings. And  
11 so there may be a perception that this has not turned  
12 into an issue yet because of a lack of enforcement in  
13 this area.

14 So starting in September 2006, enforcement  
15 will proceed for plants that do not have enforcement  
16 discretion under NFPA 805. So I just want to put that  
17 out there that currently there are no enforcement  
18 actions in this area for plants that take compensatory  
19 measures and have correction action plans.

20 MEMBER DENNING: Introduce yourselves,  
21 please.

22 MR. BARRETT: Good morning. My name is  
23 Harry Barrett. I work at Duke Power. I'm the  
24 three-site lead for NFPA 805 transition for all three  
25 of these sites in Duke Power's nuclear fleets. I just

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1 wanted to say a few words about the multiple spurious  
2 issue as it affects 805.

3           Although 805 is a risk-informed,  
4 performance-based rule, it is based on your current  
5 licensing basis going forward. And if that is  
6 questionable, then your regulatory foundation that  
7 you're billing it on would be questionable in 805,  
8 which ends up leading to a lot more effort and a lot  
9 more analysis required for that.

10           So this multiple spurious issue is adding  
11 a significant amount of paperwork and analysis to 805  
12 transition. The original concept was you would take  
13 your fire protection licensing basis, map it over to  
14 the 805 requirements, and it was pretty much just a  
15 paper transition.

16           With this new multiple spurious and the  
17 complications that that adds to the fire PRA, we're  
18 looking at a significant amount of engineering effort  
19 that goes into that.

20           It's going to take us over two years to do  
21 the transition for Oconee, which is the first plant.  
22 And a lot of that, most of that, is the PRA in the  
23 multiple spurious issue.

24           MEMBER APOSTOLAKIS: Do you agree that it  
25 is an issue?

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1 MR. BARRETT: I agree that it needs to be  
2 looked at. I have not seen a multiple spurious  
3 scenario that is risk-significant yet.

4 MEMBER APOSTOLAKIS: Do any of your plant  
5 have a detailed fire PRA?

6 MR. BARRETT: We have a fire PRA. We have  
7 --

8 MEMBER APOSTOLAKIS: Not IPEEE, though?

9 MR. BARRETT: We had an early '80s vintage  
10 fire PRA, but we are putting together a NUREG 6850,  
11 the new version of it.

12 MEMBER APOSTOLAKIS: Okay. So --

13 MR. BARRETT: We're doing that now.

14 MEMBER APOSTOLAKIS: It would be, then,  
15 possible for you to go back to that PRA and see what  
16 happens if you assume multiple --

17 MR. BARRETT: It assumed multiple in the  
18 original analysis. To use the core melt, we needed to  
19 use multiples for that particular analysis. So it  
20 included --

21 MEMBER APOSTOLAKIS: The number came out  
22 okay?

23 MR. BARRETT: It came out relatively high.  
24 I don't remember the exact number, but fire was a  
25 fairly significant contributor to risk in the --

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1 MEMBER APOSTOLAKIS: Not fire overall,  
2 but, I mean, this particular mode with --

3 MR. BARRETT: Spurious?

4 MEMBER APOSTOLAKIS: Yes.

5 MR. BARRETT: If I remember right, many of  
6 the combinations that we analyzed were within the  
7 bounds of the Appendix R analysis originally for  
8 control room evacuation. The main fire area that we  
9 got into trouble with the IPEEE or the fire PRA, the  
10 original one, was in our cable shaft going up to the  
11 control room, where we had just about every cable in  
12 the plant going through one area. And so --

13 MEMBER APOSTOLAKIS: It seems to me that  
14 --

15 CHAIRMAN WALLIS: Did you assume multiple  
16 spurious actuations, simultaneous, and all of this?

17 MR. BARRETT: In that particular PRA, we  
18 ended up having to go to multiple spurious actuations  
19 in order to get the core damage.

20 CHAIRMAN WALLIS: Okay. Including  
21 simultaneous actuations.

22 MEMBER APOSTOLAKIS: So it would be  
23 interesting, then, to compare your numbers and  
24 analysis with the bounding analysis that the NRC staff  
25 has done to see which one makes sense.

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1 I mean, it seems that we do have a body of  
2 knowledge there that at least I as a member of this  
3 Committee don't seem to have access to. I don't know  
4 whether the rest of the members are familiar with it,  
5 but I doubt it.

6 So, I mean, it would be nice to see that,  
7 especially since you have done it already, I mean.

8 MR. BARRETT: Yes. The original analysis  
9 was nowhere the rigor that 6850 requires now.

10 MEMBER APOSTOLAKIS: I understand that.  
11 I mean, you --

12 MEMBER SIEBER: It is just one plant. So  
13 it's not clear to me how you can extend that to some  
14 --

15 MEMBER APOSTOLAKIS: Yes. But it provides  
16 a basis for judging what Ray Gallucci did.

17 MEMBER SIEBER: It gives you an idea.

18 MEMBER APOSTOLAKIS: Yes. And also what  
19 kind of effort it takes to do it because under NFPA  
20 805, it seems to me that if you find -- as I recall.  
21 Maybe I'm wrong. As I recall, you're right. You're  
22 supposed to meet the regulations, but if you don't  
23 meet some of them, then you can argue in risk space.

24 MR. BARRETT: Right.

25 MEMBER APOSTOLAKIS: Right?

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1 MR. BARRETT: Right.

2 MEMBER SIEBER: You don't need to.

3 MEMBER APOSTOLAKIS: But you don't need to  
4 go back and comply. So, I mean, there is a way out of  
5 it depending on the quality of the risk assessment.

6 MEMBER SIEBER: That would be a basis for  
7 an exemption, but you can't just sit there and do  
8 nothing.

9 MEMBER APOSTOLAKIS: But is that  
10 consistent with a statement that it does a lot of  
11 work, paperwork? I mean, if you already have the PRA,  
12 why does it add a lot of work? But you just said  
13 that, right?

14 I'm sorry. I don't remember your name.

15 MR. BARRETT: Harry.

16 MEMBER SIEBER: The PRA is not  
17 state-of-the-art.

18 MR. BARRETT: Right. The original PRA is  
19 not state-of-the-art.

20 MEMBER SIEBER: They have to do the work.

21 MR. BARRETT: The one that they are doing  
22 now is state-of-the-art. They're using 6850 and --

23 MEMBER APOSTOLAKIS: When do you expect it  
24 to be completed?

25 MR. BARRETT: It should be complete by

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1 probably June of next year.

2 VICE CHAIRMAN SHACK: When you do your  
3 state-of-the-art PRA, you're going to consider  
4 multiple actuations, right?

5 MR. BARRETT: Yes.

6 MEMBER APOSTOLAKIS: Yes. So, I mean, is  
7 it clear to everyone? I mean --

8 MR. BARRETT: We are taking significant  
9 efforts to make sure we get our best chance at finding  
10 those multiple spurious risk --

11 VICE CHAIRMAN SHACK: But it seems to me  
12 that anybody doing a fire PRA is going to have to  
13 consider multiple --

14 MEMBER DENNING: Do they have to consider  
15 them as comprehensively as here? Because they will  
16 have screening criteria. And I guess can you tell me  
17 if you weren't -- you know, suppose you were not  
18 heading towards that.

19 If you are sitting there and you had to do  
20 this analysis, how long would it take you to do this  
21 analysis? And how difficult would it be to -- would  
22 you have to modify the plant to be able to accommodate  
23 it?

24 MR. BARRETT: I am not sure about that.  
25 What we would probably end up doing is using the

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1 guidance in NEI-0001, chapter 4, which is the risk  
2 analysis piece of that, which is, in essence, doing a  
3 mini PRA for the --

4 MEMBER DENNING: But you're not allowed to  
5 use that. I mean, by this generic letter, you're only  
6 allowed to do that if you're then going to look for  
7 exemptions.

8 MR. BARRETT: Right, yes. You're not  
9 doing 805. That's your only other --

10 MEMBER DENNING: Yes.

11 MR. BARRETT: I mean, you need to modify  
12 the plant or you --

13 MEMBER DENNING: Modify the plant. How  
14 long would it take you to do that analysis in --

15 MR. BARRETT: Guessing, I would say  
16 probably a year.

17 MEMBER DENNING: Probably a year. I mean,  
18 what is in here says 90 days.

19 MR. BARRETT: No way.

20 MEMBER DENNING: There's no way?

21 MR. BARRETT: No way.

22 MEMBER DENNING: You would think that --

23 MEMBER SIEBER: Well, you can tell in 90  
24 days roughly how long you think it's going to take you  
25 to do it.

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1 MEMBER DENNING: Absolutely.

2 MEMBER SIEBER: But that's not what  
3 they're asking.

4 MEMBER DENNING: But that's not what  
5 they're asking.

6 MR. BARRETT: I mean, your choices are to  
7 take your safe shutdown analysis and just say that  
8 everything in a given fire areas fails immediately.

9 MEMBER SIEBER: That is the way you used  
10 to do it.

11 MR. BARRETT: And you can't do it.

12 MEMBER SIEBER: No.

13 MR. BARRETT: I mean, with the acceptance  
14 criteria you have in Appendix R, having water level go  
15 out of the pressurizer, you can do that with just a  
16 couple of spurious actuations. If you do all of them,  
17 you're never going to make it. So I don't know how  
18 you do that in 90 days.

19 MR. WOLFGANG: This is Bob Wolfgang with  
20 again --

21 MEMBER DENNING: Go ahead, Bob.

22 MR. WOLFGANG: The 90 days, what we have  
23 currently in the generic letter is for functionality  
24 assessment. To submit any exemption requests,  
25 amendment requests, that's the six-month period.

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1 MEMBER DENNING: Yes, but what I am  
2 missing is to do the functionality assessment, don't  
3 you have to do basically the analysis?

4 MR. BARRETT: Yes. That is essentially an  
5 operability assessment. Are components operable? In  
6 order to know that, you have to do the analysis to  
7 know what gets damaged and when. There's no way  
8 you're going to do that in a short time, no way.

9 MEMBER DENNING: Dave, did you want to  
10 make some comments?

11 MEMBER SIEBER: Before we switch, one  
12 thing that you said that I think is important is you  
13 really can't get the core damage unless you have  
14 multiple spurious actuations.

15 MR. BARRETT: We have some singles that  
16 get us in trouble, and we're going to have to fix  
17 those. But as far as getting into the core damage,  
18 I'm not even sure --

19 MEMBER SIEBER: This would be opposing  
20 trains, too, right?

21 MR. BARRETT: Well --

22 MEMBER SIEBER: Train A, train B pairs.

23 MR. BARRETT: By the fire PRA methodology,  
24 you're really not even worrying about 3G2 or 3G3  
25 anymore. You're looking at fires anywhere and damage

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1 to all of the circuits.

2 MEMBER SIEBER: Right.

3 MR. BARRETT: So you're really looking at  
4 controlling fires and cable room fires and all of  
5 that. And, you know --

6 MEMBER SIEBER: But if you were to make  
7 the assumption that you only have one spurious  
8 actuation, you wouldn't get the core damage. And you  
9 could just say, "I don't need to do anything," right?

10 MEMBER APOSTOLAKIS: Well, it depends on  
11 what else fails.

12 MR. BARRETT: Yes. I think it depends  
13 largely on --

14 MEMBER SIEBER: It would be an on-fire --

15 MR. BARRETT: -- what other failures --

16 MEMBER SIEBER: -- a non-fire-induced  
17 failure, right?

18 MEMBER DENNING: There has to be a core  
19 damage frequency, though. I mean, when you said you  
20 wouldn't get core damage frequency with a single  
21 failure, you have to because you have other unrelated,  
22 but it's just very low.

23 MR. BARRETT: Also we are talking hot  
24 shorts here, but you also have fire-related damage,  
25 which takes the component out of service, which is not

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1 included in that spurious operation probability.

2 So it's a much more complicated things to  
3 get your arms around as far as loss of all electrical  
4 power, loss of indication, and all of that. It's more  
5 than that.

6 MEMBER DENNING: Yes?

7 MEMBER SIEBER: Thanks.

8 MEMBER DENNING: Dave?

9 MR. WOLFGANG: Excuse me.

10 MEMBER DENNING: Yes?

11 MR. WOLFGANG: This is Bob Wolfgang again.

12 So Duke's response to this generic letter  
13 would be we're addressing it. We're transition to  
14 NFPA 805. And we're going to address multiple  
15 spurious actuations in that transition.

16 MR. BARRETT: Yes, sir.

17 MR. WOLFGANG: And that is the total  
18 response we're looking for from --

19 MR. BARRETT: We will give you a schedule  
20 of when we think that will be done, yes.

21 MEMBER DENNING: Okay. If that is what  
22 you are asking for, you're going to have to change the  
23 generic letter.

24 MR. BARRETT: No.

25 MEMBER DENNING: My interpretation. Well,

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1 we'll look at that.

2 Dave, why don't you go ahead and say a few  
3 words?

4 MR. MISKIEWICZ: Okay. My name is Dave  
5 Miskiewicz. I'm from Progress Energy. I'm the lead  
6 PRA supporting the transition to 805 at all of our  
7 units.

8 MEMBER APOSTOLAKIS: PRA?

9 MR. MISKIEWICZ: I'm the lead PRA engineer  
10 supporting our transition.

11 MEMBER APOSTOLAKIS: I thought you said  
12 "elite."

13 (Laughter.)

14 MR. MISKIEWICZ: That does sound good.

15 A lot of the discussion I'm hearing, my  
16 perspective is probably a little bit different than  
17 the normal compliance.

18 MEMBER APOSTOLAKIS: That's why we want  
19 it.

20 MR. MISKIEWICZ: You know, there is  
21 uncertainty. And I am used to dealing with the  
22 uncertainty as how much probability I can assign to  
23 something, can I take credit for these actions and all  
24 the various things on there.

25 One of the things that strikes me is when

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1 I look at the bounding analysis and it seems like  
2 we're trying to get the best of both worlds. We want  
3 to address everything in totality and also assure that  
4 we don't have that risk.

5 You know, when I deal with traditional  
6 design basis, we are allowed one single failure. And  
7 we assume no off-site power. And we give an  
8 initiating event that happens, and that is a given.

9 PRA, we will look at multiple failures.  
10 And we may find things that are more vulnerable that  
11 weren't even addressed under compliance. And I see  
12 kind of a similar thing here except for instead of  
13 saying, "Address a single failure," we're looking at  
14 "You've got to find them all."

15 And that just seems like an impossible  
16 task. Even in the PRA world, we can model a lot of  
17 stuff, but we're still not going to get them all. But  
18 we try to find the significant things. We're trying  
19 to gear down to get the significant issues.

20 As far as the workload goes that I see on  
21 the generic letter, I think it would be significant.  
22 I'm not the circuit analysis person but when I start  
23 throwing in non-currently credited equipment into that  
24 list that I want circuits routed for and cables routed  
25 for, it is a big workload for the electrical guys who

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1 are going to be doing that work. And I would see that  
2 as a resource drain on the overall transition effort  
3 for me.

4 In fact, if I saw them, you know, all of  
5 a sudden, focusing on one area and not another area,  
6 I'm not even sure how they would be able to get all of  
7 them without doing the PRA perspective.

8 MEMBER APOSTOLAKIS: I am a little bit --  
9 I don't know what the right word is, but we keep  
10 talking about the workload. It seems to me we should  
11 be talking about the real issue.

12 Is there a real issue here? Is there a  
13 contributor to risk that we have not handled in the  
14 past or managed well? I mean, the workload I'm sure  
15 you will agree, too, it's a major contributor to risk.  
16 We have to do something about it.

17 MR. MISKIEWICZ: I agree.

18 MEMBER APOSTOLAKIS: And, you know, the  
19 thing that made me happy with Duke is that they are  
20 doing the PRA. They will consider the multiple hot  
21 shorts or spurious situations. Is your company doing  
22 something similar or --

23 MR. MISKIEWICZ: We are doing the PRA.  
24 And we're going to in the PRA model the hot shorts,  
25 the spurious actuations.

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1 MEMBER APOSTOLAKIS: According to the  
2 latest information we have and everything?

3 MR. MISKIEWICZ: When we say important,  
4 too, it's almost, you know --

5 MEMBER APOSTOLAKIS: You're not going to  
6 use .1? You're going to use .6, for example?

7 MR. MISKIEWICZ: We'll use whatever the  
8 methodology recommends.

9 MEMBER BONACA: You can go to Professor  
10 Apostolakis if you remember.

11 MEMBER APOSTOLAKIS: Give me a call. I'll  
12 tell you.

13 (Laughter.)

14 MR. MISKIEWICZ: It's .1. And we're  
15 working through those issues, but even doing that is  
16 going to be limited somewhat. You know, there are  
17 screening techniques and things used that we're going  
18 to work our way through as to which circuits really  
19 need to be evaluated.

20 MEMBER DENNING: Do you think the approach  
21 is clearly defined as to how you come up with a  
22 probability for these actuations?

23 MR. MISKIEWICZ: Right.

24 MEMBER DENNING: There is some randomness  
25 that one assumes in terms of which circuits can

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1 connect with which other circuits to --

2 MR. MISKIEWICZ: I think what we know now  
3 is better than what we knew ten years ago when we were  
4 dealing with this.

5 MEMBER DENNING: Yes. But it isn't  
6 obvious to me even what the best approach is to doing  
7 that within the fire PRA, let alone deterministically.

8 MEMBER APOSTOLAKIS: So the position,  
9 then, of at least you two gentlemen and maybe the  
10 industry is that this generic letter is unnecessary,  
11 that you are handling the issue of multiple spurious  
12 actuations via the PRA and as you transition to it --  
13 are you transitioning to 805?

14 MR. MISKIEWICZ: Yes, we are.

15 MEMBER APOSTOLAKIS: As you transition to  
16 805, you may have to come back to the NRC and, using  
17 risk arguments, request an exemption of some sort. Is  
18 that your position?

19 MEMBER BONACA: Well, I heard it  
20 differently.

21 MEMBER APOSTOLAKIS: What?

22 MEMBER BONACA: I heard it differently.  
23 I heard simply that the burden should be on the NRC to  
24 perform. Okay.

25 MEMBER APOSTOLAKIS: But they are handling

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1 it already.

2 MEMBER BONACA: Yes.

3 MR. BARRETT: We are handling multiple  
4 spurious in the PRA as part of the 805 transition.

5 MEMBER APOSTOLAKIS: And then what?

6 MR. BARRETT: And then we're going to  
7 follow the industry guidance and the regulatory  
8 guidance provided by the NRC. And depending upon  
9 where the thresholds fall in relation to the  
10 self-approval thresholds, if it's less than the  
11 self-approval threshold, then we'll end up  
12 self-approving an exemption in accordance with the NRC  
13 rules for 805 implementation.

14 MEMBER APOSTOLAKIS: Right, right.

15 MR. BARRETT: If it's over that threshold,  
16 then we'll end up having to --

17 MEMBER APOSTOLAKIS: Come back.

18 MR. BARRETT: -- contact the staff and  
19 work out whether we have to modify or whether we can  
20 leave the situation as is.

21 MEMBER APOSTOLAKIS: The conclusion one  
22 can draw from this is that you believe that this  
23 generic letter is unnecessary because there is already  
24 a process in place. Is that correct?

25 MR. BARRETT: For 805, for their plants.

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1 Not everyone is --

2 MEMBER APOSTOLAKIS: Why wouldn't another  
3 plant apply the same thing?

4 MEMBER SIEBER: It is an optional process.  
5 Some plants --

6 MEMBER APOSTOLAKIS: Oh, they don't --

7 MEMBER SIEBER: -- may decide not to do  
8 anything at all.

9 MEMBER APOSTOLAKIS: If they don't  
10 transition to 805, you mean?

11 MEMBER SIEBER: Yes.

12 MR. MARRION: If I may, Dr. Apostolakis,  
13 there are 40 plants that have submitted letters of  
14 intent to the NRC. The resolution of this issue for  
15 the 805 plans has yet to be determined. The approach  
16 is the use of the PRA, do the modeling -- all right?  
17 -- and then define that.

18 But that would be applicable to those 40  
19 plants. The other plants, the balance of the  
20 industry, have used any combination of the single  
21 failure to three or four failures.

22 You heard mention of NEI-001 that has the  
23 methodology, both -- two methodologies: deterministic  
24 and risk-informed. We piloted that at two plants.

25 And so we can't take credit for that

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1 anymore because of this new position with the generic  
2 letter. But I suspect that the solution will be had  
3 with the pilot exercise over the next several months  
4 to a year possibly and that that's the solution that  
5 needs to be evaluated for applicability to the non-805  
6 plants because, absent that, I don't see anyone coming  
7 up with a generic solution for the non-805 plants  
8 today. And it is going to be based upon PRA.

9 MR. MISKIEWICZ: Even in 805, though, when  
10 we do a fire PRA, there will be some iterative  
11 process. You know, we're dependent on the circuit  
12 analysis people giving us the information that we need  
13 to model. And so we're going to try to get risk to  
14 make sure we're modeling the right areas.

15 MEMBER SIEBER: Just the basic methodology  
16 of PRAs causes you to consider multiple spurious --

17 MR. MISKIEWICZ: If you model all of your  
18 singles and multiples from singles --

19 MEMBER SIEBER: That's the way it is.

20 MEMBER APOSTOLAKIS: But in the old days,  
21 in the first PRAs, I don't think we considered that.

22 MR. MISKIEWICZ: You modeled your singles.  
23 And they would combine in your results to give you  
24 multiples.

25 MEMBER SIEBER: Part of the process.

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1 MR. MISKIEWICZ: Yes. But you would still  
2 have to model the spurious event was a failure mode  
3 for that specific piece of equipment, --

4 MEMBER SIEBER: Right.

5 MR. MISKIEWICZ: -- which depends on the  
6 circuit analysis people telling you where that --

7 MEMBER SIEBER: So the philosophical  
8 discussion as to what the assumptions ought to be is  
9 sort of moot because the process of the PRA itself  
10 takes care of that if it's done thoroughly and done  
11 right.

12 MEMBER APOSTOLAKIS: One of the things  
13 that we don't do at this Committee is have  
14 presentations or briefings on the actual analysis that  
15 the industry is doing.

16 MEMBER SIEBER: Right.

17 MEMBER APOSTOLAKIS: I think that would be  
18 extremely beneficial to us if somehow we found a way  
19 to have the industry come and present a detailed PRA,  
20 fire PRA in this case. Anyway, that's a separate  
21 issue.

22 MEMBER DENNING: I think what we would  
23 like to do at this point is thank you gentlemen. And  
24 we may still ask you in the few minutes that we have  
25 left if we have some additional questions. We have

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1 the potential to hear about additional experimental  
2 work that could potentially change some perspectives,  
3 but I don't think we'll do that.

4 I think what we ought to do now is we  
5 would have some discussion while we still have the  
6 staff here and the industry here, we have some  
7 discussion? Would you agree, Graham, that we'll have  
8 some discussion here, see just kind of where we are  
9 sitting on this?

10 CHAIRMAN WALLIS: I was thinking about  
11 that. I think we certainly need discussion.

12 MEMBER SIEBER: Yes.

13 CHAIRMAN WALLIS: I think some of it needs  
14 to be in our working session, --

15 MEMBER DENNING: Yes.

16 CHAIRMAN WALLIS: -- rather than open  
17 session, but I think we can do some of it now. What  
18 little bit we can do now to clarify the situation  
19 certainly we should do now.

20 MEMBER ARMIJO: I have a question that may  
21 not be a discussion. Just in reading the staff's  
22 response to a lot of the comments received on the  
23 draft, there was reference to a lot of -- where is  
24 this thing, the screening tool, a risk screening tool,  
25 that the licensees develop a risk screening tool to be

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1 reviewed and approved by the staff.

2 This is a tool that would evaluate a  
3 variety of different multiple spurious actuations and  
4 sort them out and say, "These are the ones to worry  
5 about. And the rest we don't have to worry about."

6 What is your view? Does such a tool  
7 exist? Do you use such tools, both parties?

8 MR. MISKIEWICZ: We haven't kind of gotten  
9 to that step yet. I'm not exactly sure what the  
10 paragraph is you are referring to.

11 MEMBER ARMIJO: Yes. It's --

12 MR. MISKIEWICZ: But we can do  
13 sensitivities and say, "If I just fail the system, you  
14 know, a functional type of thing, if it's not  
15 significant, then I don't have to go down deeper and  
16 model all the individual spurious. I can screen it by  
17 saying it's not going to matter without doing the  
18 detailed modeling," you know.

19 MEMBER APOSTOLAKIS: The screening depends  
20 on a number of factors, this being one, but the other  
21 is the amount of fuel you have in your area, whether  
22 you can have a fire to begin with, the fire PRA.

23 MEMBER ARMIJO: I thought it was here is  
24 a large number of conductors that can cause spurious  
25 actuations of a large number of systems. And nobody

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1 has defined what scenarios are worrisome. It seems to  
2 me like it's a large number of mind-boggling barriers.  
3 And how do you sort those all?

4 MR. BARRETT: Let me address that.

5 MEMBER ARMIJO: Yes.

6 MR. BARRETT: One of the things that Duke  
7 has done -- and I think Progress is going to follow  
8 suit when they actually do their PRA -- is we have  
9 attempted to put our arms around the most significant  
10 multiples that we could think of by putting together  
11 an expert panel of people who know the plant, know the  
12 Appendix R design, no fire protection, and postulate  
13 these in an organized fashion, like going through  
14 PNIDs and plant design records to say, "All right.  
15 What are the real multiple spurious combinations that  
16 would really hurt me?" and capture those in scenarios  
17 so that they can be analyzed in detail in the fire PRA  
18 so that we can really look at the risk.

19 We're looking at it taking a three-pronged  
20 approach. We have the Appendix R analysis that says,  
21 "Here is all the safe shutdown stuff that I've got to  
22 have. Here are the cables and where they go in the  
23 plant. And then here is what gets damaged in each  
24 fire area."

25 And we take the expert panel. And we say,

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1 "Well, is there anything we missed? You know, is  
2 there something out there that because you end up  
3 flushing the toilet over here and you end up turning  
4 that light bulb on, the combination of things gets you  
5 something you didn't expect?" The expert panel is  
6 supposed to deal with that.

7 And then we also look at the PRA and true  
8 up all AOVs, true up all MOVs, and see if those kinds  
9 of things give us surprises that we didn't expect.  
10 Between the three of those, we think we're going to  
11 end up probably having 95 percent of the  
12 risk-significant scenarios.

13 MEMBER DENNING: For all of your plants,  
14 do you know where your cables are by tray?

15 MR. BARRETT: We didn't. We ended up  
16 having to pay to have that analysis done for us. I  
17 think it was originally determined in the '80s but was  
18 not captured in a database or anything. And we had to  
19 go back and --

20 MEMBER DENNING: But you had that for all  
21 your plants, do you?

22 MR. MISKIEWICZ: I wouldn't say all of the  
23 plants. That's a lot of work. In a lot of cases it's  
24 limited to the set of equipment that met the rule for  
25 the Appendix R compliance --

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1 MEMBER DENNING: It seems to say that --

2 MR. MISKIEWICZ: -- or our equipment that  
3 we want to credit from PRA perspective because there  
4 is risk-significant equipment in mitigation that is  
5 not within the scope of Appendix R right now. And  
6 that we'll add to the list. And some of those still  
7 need to be routed.

8 MEMBER DENNING: You do have additional  
9 cable routing that you would have to determine;  
10 whereas, you feel that you have already done the --

11 MR. BARRETT: There were some things in  
12 the PRA that we had not addressed in safe shutdown,  
13 and we're going to have to have --

14 MEMBER DENNING: Well, PRA is one thing.  
15 What about with this requirement? Does that change?  
16 Would you have to -- if this was imposed on you, do  
17 you think you have to do more cable tracing?

18 MR. BARRETT: What I'm talking about is  
19 our attempt to try to get our arms around all of the  
20 risk-significant scenarios.

21 MEMBER DENNING: Scenarios? Okay.

22 MR. BARRETT: So that's why we did the  
23 expert panel and all of that, to try to get our arms  
24 around things that we would have otherwise missed.

25 MEMBER DENNING: You keep saying

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1 "risk-significant." And we're in a space here where  
2 we're not necessarily risk-significant. It's broader  
3 than that.

4 MR. BARRETT: I think if you take all of  
5 the cables and you just fail them all and you say they  
6 all happen immediately, you're done.

7 MEMBER DENNING: You can't survive.

8 MR. BARRETT: Some of these areas you  
9 can't survive it.

10 MEMBER DENNING: Okay.

11 MEMBER SIEBER: On the other hand, from a  
12 risk standpoint, the set of cables that you have to  
13 know what the routing is becomes larger than the  
14 Appendix R set.

15 MR. BARRETT: Yes.

16 MEMBER SIEBER: But it is certainly not  
17 all of the cables. So there is going to be some  
18 physical work that has to be done if you don't have  
19 pull ticket. If you don't have the database, you  
20 can't --

21 VICE CHAIRMAN SHACK: In the NEI-001  
22 guidance, where, as I understand it, you do up to four  
23 failures, how do you select those four?

24 MR. BARRETT: A similar process with the  
25 expert panel and using Appendix R analysis, a similar

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1 process.

2 MR. FRUMKIN: This is Dan Frumkin from the  
3 staff.

4 One of the things that we have discovered  
5 about defining a failure is a lot of the analyses  
6 assume once spurious actuation, once spurious  
7 actuation, what the NEI or at least the risk, 2,403 --  
8 and I think NEI-001. They talk about multiple hot  
9 shorts.

10 Now, one pair of conductors coming  
11 together could cause numerous different spurious  
12 actuations. So I think that the staff and the --  
13 well, the staff has come out with 2,403 and has put it  
14 on the table.

15 We are looking for this hot short. That  
16 could cause whatever it could cause. We're not  
17 counting spurious actuations anymore. We're taking  
18 that hot short and saying, "Well, what could it  
19 cause?"

20 I think there was a situation where there  
21 was one cable or just a number, just a few conductors,  
22 or maybe it was even two conductors that could give an  
23 indication which could open all of 16 SRVs at one  
24 plant.

25 Now, a long time ago that might have been

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1 16 separate spurious actuations. And today we're  
2 looking at that as one pair of conductors coming  
3 together. And I think everybody is pretty much on the  
4 same page that yes, obviously if the circuits can  
5 cause all of those spurious actuations, we consider  
6 that.

7 MEMBER DENNING: Well, I guess a comment  
8 that I would have on generally what I have heard is  
9 that I think it's very clear that there are timing  
10 issues. If we go forward with the generic letter,  
11 then, at least in my interpretation of the generic  
12 letter, there are timing requirements that are not  
13 doable by the industry and that one would have to do  
14 some relaxation of that. And I don't see where just  
15 having the 30-day, where they can say, "It's going to  
16 take me longer as appropriate."

17 Now, it could be that maybe this should be  
18 more of an information-gathering generic letter,  
19 rather than one that is quite forcing the NRC's  
20 position about the need for multiple spurious  
21 actuations without a more relaxed position like NEI's.

22 I guess what I'm looking for are general  
23 comments as to people, where they are seemingly  
24 falling on this generic letter.

25 MEMBER MAYNARD: Well, I would agree with

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1 most of your comments there. First of all, I do  
2 believe that it clearly constitutes a backfit. We  
3 will get into some other things later on that, but we  
4 don't have to change regulations to be changing  
5 requirements. A change in staff position on what is  
6 acceptable for meeting a regulation, changing those  
7 position, also constitutes a backfit.

8 With that said, I would also like to say  
9 that this issue needs to be resolved. I think playing  
10 around too long about what is the right regulatory  
11 process isn't going to serve everybody's best interest  
12 either.

13 I think it is important. This issue has  
14 been around for 25 years. It needs to get resolved in  
15 an approach going forward as to what is it going to  
16 take to either make it go away as an issue or to  
17 actually fix it.

18 I think the 90 days, I think basically if  
19 it goes out the way it is, basically you're going to  
20 end up with everybody coming in with time request  
21 extensions. And so I don't think that's really the  
22 right thing to do there.

23 If it goes out the way it is, I think it  
24 needs to extend that time. I think it might be better  
25 to go out with what is truly an information request,

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1 to gather information to then be able to determine  
2 what the next steps are.

3 But, again, I don't think process should  
4 drag out for another 5 or 10 or 15, 20 years.  
5 Something needs to be done to put it on a resolution  
6 path.

7 VICE CHAIRMAN SHACK: Let me just come  
8 back to that for a second. I mean, we know what you  
9 expect from the 40 plants that are going for NFPA 805.  
10 What do you expect from the others?

11 MR. WOLFGANG: This is Bob Wolfgang again.

12 I think a number of them are going to come  
13 back and say, "We meet our licensing basis, and thank  
14 you very much. And good-bye."

15 MEMBER DENNING: Will they really say  
16 that? I mean, your --

17 MR. WOLFGANG: That is one thing.

18 VICE CHAIRMAN SHACK: Will you accept that  
19 answer?

20 MEMBER SIEBER: Send it over to  
21 enforcement.

22 MR. WOLFGANG: No. No, we won't. What we  
23 will hear from others is --

24 VICE CHAIRMAN SHACK: What would you  
25 consider an acceptable response from the others?

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1 MR. WOLFGANG: Well, "We don't address  
2 multiple spurious actuations. Here is our plan to  
3 address it to do" X, Y, Z. I don't know. "Do  
4 physical mods."

5 MEMBER DENNING: That's a six months'  
6 answer.

7 MR. WOLFGANG: Yes. That will be the  
8 six-month answer. But initially, yes, either you meet  
9 it or you don't meet it. We don't think we meet it.  
10 We think we meet it.

11 For the first round, that's all I think  
12 we're going to get.

13 MEMBER DENNING: Getting back to this  
14 backfit question, I'm not sure that ACRS is the  
15 appropriate one to answer that. Obviously it makes it  
16 easier for the regulatory staff if it's not a backfit  
17 question.

18 MEMBER BONACA: Yes. One thing that  
19 troubles me a little bit is, you know, is it a  
20 significant issue or is it not a significant issue?  
21 That's a plant-specific answer. And so we're not  
22 going to find out an answer to the question.

23 And I think that if we had to perform a  
24 generic evaluation to justify a backfit, I'm not sure  
25 that it could be done because, I mean, it's so

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1 specific to the plant, the age, to whatever the  
2 situation may be.

3 MEMBER DENNING: But this question of a  
4 specific issue, I think you can do a reduced analysis  
5 to determine. I think you can screen out stuff a  
6 priori --

7 MEMBER BONACA: I think so, too.

8 MEMBER DENNING: -- you know, so that it  
9 isn't such an onerous job to determine what's  
10 important and what's a potentially significant risk  
11 contributor here.

12 MEMBER BONACA: Clearly, I mean, something  
13 has to be done. I mean, we have new evidence in front  
14 of us. And I completely agree with you, Otto, that it  
15 can't wait. They have to be dealt with.

16 I think that, however, the industry needs  
17 more time to deal with this. They don't have a  
18 ready-made process by which they can screen this out  
19 and address it. So the issue is more the time.

20 Now, the next statement again, as reported  
21 to you, is the fact that we are not really the best  
22 charges of what is the most appropriate regulatory  
23 process to follow to go ahead with this.

24 MEMBER APOSTOLAKIS: Our job here is to  
25 judge the generic letter as presented to us.

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1 MEMBER BONACA: Yes.

2 CHAIRMAN WALLIS: I am just wondering how  
3 we add value to this. If we were a subcommittee, we  
4 might well say, "Look, we now know what the issues  
5 are. We think there must be a better way than having  
6 the agency send out this generic letter asking for  
7 things which may be impractical for some plants," but,  
8 then, there should be some way to work with the plants  
9 to figure out what is the right solution to this  
10 technical problem. I'm not sure.

11 We're also sort of a facilitator between  
12 industry and the agency, and that's not really our  
13 job, though, is it?

14 MEMBER SIEBER: Well, the other thing that  
15 is not our job is to try to figure out whether it's a  
16 backfit or not. That's a legal question.

17 CHAIRMAN WALLIS: Well, we don't even know  
18 how important it is because we don't have these proper  
19 risk analyses.

20 MEMBER DENNING: Well, having resolved  
21 these questions, I now turn it back to you, Mr.  
22 Chairman.

23 (Laughter.)

24 CHAIRMAN WALLIS: I can make a very  
25 decision, which is to take a break for lunch. We are

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1 going to be ethics-trained at 12:15. And then we go  
2 to work again at 1:30. Thank you very much for your  
3 presentations.

4 We'll take a break, and as a Committee,  
5 we're going to be back here, not on the transcripts or  
6 anything, for ethics training at 12:15. We'll start  
7 the official proceedings again at 1:30.

8 (Whereupon, a luncheon recess was taken  
9 at 11:33 a.m.)

A-F-T-E-R-N-O-O-N S-E-S-S-I-O-N

(1:33 p.m.)

CHAIRMAN WALLIS: Back into session. The next item on the agenda is another generic letter; first of all, underground cable failures that disable accident mitigation systems.

Our cognizant member is Mario Bonaca. I will hand over the meeting to him. Please go ahead, Mario.

MEMBER BONACA: Thank you, Mr. Chairman.

3) DRAFT FINAL GENERIC LETTER 2006-XX,

"INACCESSIBLE OR UNDERGROUND CABLE FAILURES THAT  
DISABLE ACCIDENT MITIGATION SYSTEMS"

3.1) REMARKS BY THE SUBCOMMITTEE CHAIRMAN

MEMBER BONACA: We have a presentation from the staff. They are proposing to issue a generic letter on inaccessible underground cable failures that disable accident mitigation systems.

We have recently become conversant with this issue through license renewal. You may remember that the GALL report requires for license renewal the existence of two programs: one, a program to detect the presence of water and the watering actions; and the other one is a program to test the cables and essentially-- so we are aware of the concern here.

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1 And the staff is now addressing this issue in the  
2 current licensing area.

3 And so, with that, I will turn to the  
4 staff. Mr. Mayfield?

5 3.2) BRIEFING BY AND DISCUSSIONS WITH  
6 REPRESENTATIVES OF THE NRC STAFF

7 MR. MAYFIELD: Good afternoon. I'm Mike  
8 Mayfield, the Director of the Division of Engineering.  
9 And my division is sponsoring this generic letter.

10 We're here this afternoon to seek ACRS  
11 endorsement to publish the generic letter. The  
12 generic letter, as Mr. Koshy will describe, provides  
13 some information to licensees on the significance of  
14 these potential failures, and seeks some information  
15 from licensees regarding the monitoring of these  
16 cables.

17 Tom Koshy from the Electrical Engineering  
18 Branch will make the presentation.

19 MR. KOSHY: Thank you, Mike.

20 As Dr. Bonaca mentioned to you, this was  
21 first brought to your attention as a problem during  
22 the license renewal hearing at the ACRS. The question  
23 was, is dewatering every ten years going to prevent  
24 the problem?

25 At that time, in light of the failures

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1 that we had noticed at the time, we thought of taking  
2 it as an operating reactor issue under Part 50. And  
3 we did some serious looking into see how big the  
4 problems are.

5 The safety concerns identified at the time  
6 were some of these underground and inaccessible cables  
7 supply power to some safety-related components. Using  
8 some examples here, the off-site power, the cable that  
9 brings the off-site power, to the safety buses.

10 The second would be the emergency diesel  
11 generator feeder. This is critical in those cases  
12 where the emergency diesel generator to building is  
13 physical apart from the main building so that the  
14 underground cables bring into power; and then the  
15 emergency service water pumps, these cases where the  
16 pump house is located again, you know, physically away  
17 from the plant so that the power supply to the service  
18 water pump has to go through underground cables.

19 And failure of one of these cables could  
20 affect multiple systems in these sense there could be  
21 a train, cooling off of safety systems, collectively  
22 influencing more than just one isolated system.

23 Most of these failures that we came across  
24 did not have any direct reference to having a  
25 qualification for this cable to withstand the moisture

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1 environment or, essentially, you know, in duct banks,  
2 if it is immersed in water, you know, can it  
3 withstand. That type of qualification had not been in  
4 existence for these cables that we came across.

5 MEMBER BONACA: Let me understand now,  
6 however. These are cables in safety-related  
7 applications?

8 MR. KOSHY: Yes.

9 MEMBER BONACA: Okay. So evidently on day  
10 one, when the plant was built, there was no  
11 expectation that the cable would be wetted?

12 MR. KOSHY: Yes. In fact, they thought it  
13 would stay relatively dry, but as duct banks develop  
14 cracks, you know, there would be traffic about it.  
15 And eventually these things crack. And depending on  
16 the water table, you know, it could be immersed for a  
17 long time or maybe a short time.

18 MEMBER BONACA: Well, in many cases, these  
19 cables are buried --

20 MR. KOSHY: Yes.

21 MEMBER BONACA: -- in the ground. So from  
22 day one, there was an expectation that they would see  
23 humidity and why we are not environmentally qualified.

24 MR. KOSHY: Either it was not specified at  
25 the time or they thought that, you know, the existing

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1 material at the time could withstand some level of  
2 moisture. For some reason, they did not specifically  
3 seek out.

4 The reason I stated that is, you know,  
5 much in the later period, now we have cables that can  
6 withstand such highly moist environment. In fact, I  
7 know of a case where they have run the cable to the  
8 river. That's for a --

9 CHAIRMAN WALLIS: But not forever.

10 MR. KOSHY: Excuse me?

11 CHAIRMAN WALLIS: Just because they are  
12 qualified doesn't mean they will survive forever in  
13 this environment.

14 MR. KOSHY: You are right, yes. Yes.  
15 They may not survive forever, but at least, you know,  
16 they have some demonstrated capability for a certain  
17 period that it can be even immersed in water and still  
18 do its function.

19 But all of that addresses, you know, the  
20 possibility that you need to know the condition of the  
21 insulation so that you have that confidence that it  
22 can do its function for the foreseeable future.

23 We went back into the history of the LERs  
24 that we have on record. We saw failure at 17 sites  
25 and cable replacements at 100 or so. And most of the

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1 faulty cables were not discovered until there was an  
2 operational failure.

3 Again, these are based on LERs, where the  
4 system has a redundant system or some reason, because  
5 of a plant trip or the failure was serious enough it  
6 prompted an LER.

7 MEMBER ARMIJO: What is your definition of  
8 a medium cable?

9 MR. KOSHY: 5 kV.

10 MEMBER ARMIJO: And above?

11 MR. KOSHY: 5 kV. Well, in the sense of  
12 when you go into 13 kV, you know, some people label it  
13 as medium also.

14 MEMBER ARMIJO: Okay.

15 CHAIRMAN WALLIS: High tension.

16 MEMBER SIEBER: Four-eighty volts to --

17 MR. KOSHY: Four-eighty will be below  
18 that. Yes. We will not call that medium, yes.

19 MEMBER SIEBER: Four-eighty is --

20 MEMBER BONACA: But you include those?

21 MR. KOSHY: Excuse me?

22 MEMBER BONACA: But you include those in  
23 the --

24 MR. KOSHY: Yes, we are including those  
25 because there are certain plants where the emergency

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1 diesel generator generates voltage at 480 and  
2 emergency service water and safety pumps are at 480  
3 volts, some small plants and early vintage.

4 MEMBER BONACA: Okay.

5 MR. KOSHY: So we wanted to include that  
6 also. That's why we went more than just medium  
7 voltage.

8 The EPRI data indicated about 65 cable  
9 failures. And later the white paper which NEI has  
10 submitted indicated about 55 failures for about 15  
11 plants.

12 Most of the cable failures have what in  
13 common? It's about 12 years of age. And the cable  
14 was subjected to some type of, you know, moisture  
15 environment, probably for a longer duration or a  
16 shorter duration. And these things were essentially  
17 common factors.

18 The cables, again, that we are focusing on  
19 is about roughly about six to eight cables, you know,  
20 depending on the design uniqueness, the cables that  
21 can have the most, let's say, significant impact on  
22 the plant.

23 MEMBER MAYNARD: The cable was about 12  
24 years old? You're saying that all of these failures  
25 were about the same age or --

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1 MR. KOSHY: No. More than that. There  
2 are some 20-plus.

3 MEMBER MAYNARD: Okay. All right.

4 MR. KOSHY: Yes.

5 CHAIRMAN WALLIS: It was at least 12 years  
6 old. At least 12 years. I was trying to figure it  
7 out. If it's every 12 years, that's pretty severe.

8 MR. KOSHY: You're right. Twelve and  
9 above. So in this generic letter, what we are  
10 focusing on is power cables that are within the scope  
11 of the maintenance rule, including cables connected to  
12 off-site power, emergency service water, and the other  
13 examples that I stated before, and those routed  
14 through underground or inaccessible locations, such as  
15 buried conduits, cable troughs, above-ground and  
16 underground. And these are the things that we are  
17 considering to be within the scope of this generic  
18 letter.

19 The benefits of this program are gaining  
20 confidence in the capability of the cable to respond  
21 to design bases events. To give you an example, at  
22 Turkey Point after the hurricane, the diesel had to  
23 run for about a week continuously. And thereafter for  
24 a month's period, the diesel had to come back on for  
25 other spurious power outages.

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1           So if you are looking into an accident  
2 where it has to be on a LOOP condition where these  
3 cables may need to be relied on for a few weeks. So  
4 we are not looking at a few hours of operation. The  
5 confidence needs to be gained for a period much higher  
6 than a few hours, which is usually the subject of our  
7 maintenance and surveillance activities.

8           MEMBER BONACA: Do you have examples of  
9 failures in service that were not exhibited during  
10 functional testing?

11           MR. KOSHY: What we have, the reported  
12 failures are a combination of both. Some in-service  
13 failures certain plants appear to have more than  
14 others. And others, when you start for surveillance,  
15 you find out that, you know, after a couple of hours,  
16 it fails.

17           So the LERs that we recorded are those  
18 cases where the plant impact was significant, so in  
19 the sense either operational. And if it is purely  
20 during a surveillance, we will not get an LER report  
21 on it.

22           So that's some of the problem that we are  
23 facing. The LERs that we received are so limited in  
24 number because, you know, it had to either bring a  
25 plant down or give an easy access situation for us to

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1 plant an LER report.

2 So that's why we are focusing on getting  
3 a handle on the extent of failures so we can engage  
4 them and see what other actions would be necessary.

5 CHAIRMAN WALLIS: Could you explain  
6 something to me?

7 MR. KOSHY: Yes.

8 CHAIRMAN WALLIS: I can understand  
9 off-site power sort of coming in on the underground  
10 cable. Why is diesel generator? Why does the diesel  
11 generator have underground cables? Is it part of the  
12 plant?

13 MR. KOSHY: Yes. For example, in some  
14 plants, the building is a separate building.

15 CHAIRMAN WALLIS: It's in a separate  
16 building. It's in a separate building.

17 MR. KOSHY: Yes. For example --

18 CHAIRMAN WALLIS: Okay.

19 MR. KOSHY: -- they have separate  
20 building.

21 CHAIRMAN WALLIS: They might be in a  
22 separate building?

23 MR. KOSHY: Yes.

24 CHAIRMAN WALLIS: That's very different  
25 from, say, something that comes from off-site power,

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1 where the cable may be a long cable from --

2 MR. KOSHY: Yes. That will be  
3 significantly longer. That will be from the  
4 switchyard. In some cases, you will have a situation  
5 closer to the plant, where you bring down to 13 kVR or  
6 so.

7 CHAIRMAN WALLIS: Okay. Thank you.

8 MR. KOSHY: The next benefit is we can  
9 prevent the unanticipated failures that cause plant  
10 transients by using the maintenance rule as the scope.  
11 We are also looking at challenges to the plant in the  
12 sense of what will give you a plant transient. So  
13 that is what is seen as the scope of this generic  
14 letter.

15 The next is you can use a convenient  
16 outage if you know the rate of degradation. Rather  
17 than taking, you know, unwarranted outages, you can  
18 schedule that cable replacement for a convenient  
19 refueling outage and do the replacement with minimum  
20 interruption.

21 CHAIRMAN WALLIS: Are these cables usually  
22 designed so they can easily be pulled through to  
23 repair them?

24 MR. KOSHY: No. It is very  
25 time-consuming, most of the --

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1 CHAIRMAN WALLIS: There's not a big duct  
2 in the cable and you just drag through a new cable?

3 MR. KOSHY: No.

4 CHAIRMAN WALLIS: No? You have to take it  
5 out? You have to dig it up?

6 MEMBER SIEBER: It's the whole thing. No.

7 MR. KOSHY: Well, pull-through is there,  
8 but the thing is it has a lot of staging. And you  
9 have energized equipment on both sides. So you need  
10 to essentially take some bus outages. So it is  
11 significantly time-consuming.

12 CHAIRMAN WALLIS: Yes, but you don't have  
13 to dig it out?

14 MR. KOSHY: Unless it is direct buried  
15 cable.

16 MEMBER BONACA: In fact, I mean, for  
17 example, yesterday during the review of Monticello,  
18 the majority of their underground cable, they're  
19 buried.

20 CHAIRMAN WALLIS: Those are usually  
21 utility duct or something, in other words.

22 VICE CHAIRMAN SHACK: This is direct  
23 buried.

24 CHAIRMAN WALLIS: Direct buried cable?

25 MR. KOSHY: Those are not exceptions.

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1 Usually you will have a duct bank with some sleeves in  
2 there so that you can pull through it.

3 MEMBER BONACA: And it depends on the age  
4 of the plant. I mean, Monticello is an older plant.  
5 They buried it, and that was it.

6 MR. KOSHY: So you have a wide variety on  
7 those?

8 MR. MORRIS: Tom, George Morris, EEEB.  
9 Some of the original cables that were pulled through  
10 duct bank, all of the original cables that were pulled  
11 through duct bank, were pulled through with the use of  
12 cable lubricant to reduce the friction. After they  
13 had been in there for a while, that lubricant has  
14 dried up.

15 MEMBER BONACA: It doesn't work.

16 MR. MORRIS: In some cases, it's almost  
17 like concrete.

18 MR. KOSHY: Okay. Moving on to some  
19 examples, Ocone is a success story where they found  
20 that two of the six cables had significant  
21 degradation. And they were able to monitor it and  
22 take the outage at a convenient time so that they can  
23 replace them.

24 Another example I am using here is Peach  
25 Bottom. When they experienced a failure, they decided

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1 to make a global replacement. You know, they didn't  
2 want to do any testing at all. And that's also a  
3 solution.

4 CHAIRMAN WALLIS: Now, is it always water  
5 that leads to degraded cables? It seems to me that  
6 you could have a cable and a duct which might just --  
7 you know, the insulation can over a period of time  
8 oxide or whatever it does. I mean, even in your house  
9 without water, you get cables that --

10 MR. KOSHY: Yes.

11 CHAIRMAN WALLIS: The insulation cracks  
12 and so on.

13 MR. KOSHY: This has some influence in the  
14 sense if it is a dry insulation and there is only  
15 cracks, chances are it will survive a little longer.

16 CHAIRMAN WALLIS: That's right, but it may  
17 --

18 MR. KOSHY: The presence of chemicals --

19 CHAIRMAN WALLIS: Makes it work.

20 MR. KOSHY: -- create default.

21 CHAIRMAN WALLIS: It's not essential that  
22 you have moisture, is it?

23 MR. KOSHY: Right. You're right. We are  
24 not trying to look at the root cause of what causes  
25 the failure. We are more interested in seeing,

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1       irrespective of the causes, let's have a program in  
2       place so that we can prevent such unanticipated  
3       failures and have a great confidence in the accident  
4       mitigation capability. So that's the focus we are  
5       trying to get because for --

6                   CHAIRMAN WALLIS: There is no routine  
7       measurement of, say, resistance of ground of a cable?  
8       There is no routine --

9                   MR. KOSHY: There is some technology  
10      developing that way, but online systems have not been  
11      doing that well. I think the industry is headed that  
12      way and there is some aggressive effort in the  
13      industry for coming up with something like that or,  
14      rather, building confidence in the systems that are  
15      now under development.

16                   Oyster Creek is an example where they  
17      replaced the cables and they had few repeated  
18      failures. This design is also unique. They  
19      essentially had this cable going about 200 feet away  
20      from the main plant as an extension of the safety bus.  
21      And this is remaining energized all the time. And  
22      that earlier had several failures.

23                   So the information that we are requesting  
24      is provide to us a history of the cable failures in  
25      the scope that I discussed just before and a

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1 description and frequency of the inspection, testing,  
2 and the monitoring programs in place. And if you do  
3 not have a monitoring program in place, explain to us  
4 why such a program is not necessary. So that is  
5 essentially what we are asking in --

6 CHAIRMAN WALLIS: So this is really  
7 information gathering. This isn't requiring an  
8 action?

9 MR. KOSHY: Right, right.

10 VICE CHAIRMAN SHACK: Now, are you  
11 distinguishing between a monitoring program and a  
12 functional testing program here?

13 MR. KOSHY: Okay. The explanation that we  
14 have given, in fact, I am addressing as a response to  
15 a public comment, what we are saying is the functional  
16 testing that you do that you energize for a short  
17 period doesn't give you any confidence that it will do  
18 it again.

19 VICE CHAIRMAN SHACK: Okay. So you're not  
20 counting that as a monitoring program?

21 MR. KOSHY: Yes. We are not.

22 MEMBER SIEBER: A surveillance test.

23 MR. KOSHY: These are the organizations  
24 that have given response to the first version that  
25 went out for public comments. And I will address the

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1 highlights of how we addressed those comments.

2 Cable failures are random. And,  
3 therefore, no NRC action is required.

4 CHAIRMAN WALLIS: It sounds like saying  
5 they're an act of God or something.

6 MR. KOSHY: Yes. We just explained the  
7 surveillance activity, which wouldn't give you  
8 confidence on its future performance. You need to in  
9 some way monitor the condition of that insulation so  
10 that we can build that confidence.

11 Again, you know, this is the small group  
12 of cable where you have this problem. Otherwise, the  
13 rest of the cable is in a dry environment. Next to  
14 selectable sealed-in concrete, you know, these cables  
15 should be the most reliable piece of equipment in a  
16 plant, you know, should not be failing for about 40  
17 years or, in fact, for 60 years, you know, if it is  
18 the environment and the conditions are right.

19 And I quickly explained before that the  
20 low-voltage cables are included because some of the  
21 early vintage plants have this 480-volt equipment for  
22 safety buses, diesel, and naturalized emergency  
23 service water, and service water equipment.

24 CHAIRMAN WALLIS: The original sentence is  
25 garbled. It doesn't matter. Essentially we have a

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1 period after impact, and that's all right. Scope is  
2 limited.

3 MR. KOSHY: Okay. Again, we just  
4 addressed this issue, why this basic surveillance  
5 tests of operating for a half an hour or two hours  
6 wouldn't be sufficient to gain that confidence for --

7 CHAIRMAN WALLIS: What you do is you put  
8 on them the voltage that they would have in operations  
9 and --

10 MR. KOSHY: No. You actually energize a  
11 --

12 CHAIRMAN WALLIS: Do you actually have to  
13 have current going? Do you have to current going  
14 through these cables to test them or does it have the  
15 voltage applied to them and see if there's a leakage?

16 MR. KOSHY: Yes. There are about eight or  
17 ten techniques in the industry.

18 CHAIRMAN WALLIS: There's a whole lot of  
19 techniques.

20 MR. KOSHY: Yes, yes. And the thing is  
21 the early technique was just apply very high voltage  
22 and make it fail. That was the most crude way of  
23 doing it.

24 MEMBER SIEBER: Meggering.

25 MR. KOSHY: Meggering is another method,

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1 but that has certain weaknesses, too.

2 MEMBER SIEBER: You have reflective  
3 techniques.

4 MR. KOSHY: Yes. Time domain reflects  
5 III, and about six or eight techniques are there. And  
6 there are still some under development. Collectively  
7 you have about two IEEE standards that go into details  
8 of the type of tests available and the level of  
9 confidence that you have based on the type of cable.

10 So depending on if you have a shield and  
11 what kind of shield and what type of rubber material  
12 is used, the level of confidence is different, you  
13 know, depending on the type of test that you do.

14 So there is some industry that two IEEE  
15 standards are available to address that and which one  
16 is better and which one is desired.

17 MEMBER SIEBER: You can get some pretty  
18 high voltages in these cables from switching  
19 transients.

20 MR. KOSHY: That's true.

21 MEMBER SIEBER: It will go well beyond the  
22 rating for a very brief period of time. And sometimes  
23 that's when the insulation fails.

24 MR. KOSHY: Yes.

25 MEMBER BONACA: By "surveillance test,"

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1 you mean surveillance of the equipment and this power  
2 by the cable?

3 MR. KOSHY: Right. You are giving normal  
4 voltage and normal function of a couple of hours, you  
5 know, like in the pump in service inspection or type  
6 of surveillance you will expect to run in for two or  
7 three hours, make sure it is for using the rate of  
8 flow and things like that. That's the type of test  
9 that will not give you a feeling of how good the  
10 insulation is. Will it last for the next two weeks of  
11 runoff?

12 The regulatory basis for our cable  
13 monitoring is we have added that what is seen in bold,  
14 that condition is something that we really did not  
15 have in the first version. And we are essentially  
16 saying that "assess the continuity of the systems and  
17 the condition of the components." So you need to know  
18 the condition of this insulation so that we can have  
19 that confidence on its performance.

20 MEMBER ARMIJO: Could you expand that?  
21 Condition based on electrical properties? Are you  
22 actually looking for physical condition? They're in  
23 accessible.

24 MR. KOSHY: These are inaccessible, but  
25 you do have state-of-the-art techniques available in

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1 electrical testing which will measure the testing of  
2 the insulation.

3 MEMBER ARMIJO: Okay.

4 MR. KOSHY: So if you can establish that  
5 the integrity of the insulation is reasonable, then  
6 you have that confidence that it will not fail in the  
7 most probable cases.

8 MEMBER ARMIJO: Thank you.

9 MR. KOSHY: The question was regarding  
10 multiple cable failures. The only example that we  
11 have collected in light of our efforts is a case where  
12 one insulation failure was in the circulating water  
13 pump, resulted in taking two other substations out  
14 with it.

15 The possibility that we are talking of is  
16 the fault itself causes a transient and sends some  
17 transient current. And if you have some near-failure  
18 equipment, that can be a cause for additional  
19 failures. You know, these are speculative problems.  
20 And this is the only example that we have on record  
21 for that.

22 Now, the modifications that we have done  
23 in light of the comments on this are editorial in  
24 nature, a good part. We revised the scope to include  
25 the above-ground and below-ground duct banks; removed

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1 the broadband spectroscopy because that's not a proven  
2 technique yet, but, again, that could be a technique  
3 available in the future; revised the requested  
4 information to include the type of service so that we  
5 will be able to know if there are repeated failures in  
6 a certain area. And we revised the data collection  
7 time to 60 hours.

8 CHAIRMAN WALLIS: So it would seem that  
9 there is still a gap between your view and the  
10 industry's view.

11 MR. KOSHY: Yes.

12 CHAIRMAN WALLIS: The industry had some  
13 pretty strong comments. And your modifications don't  
14 reflect large changes in response to their comments.

15 MEMBER SIEBER: Right.

16 CHAIRMAN WALLIS: So there would seem to  
17 be still a big gap between your view and the  
18 industry's view. Is that true?

19 MR. KOSHY: I will address that in the  
20 next slides along with the NEI white paper issues, in  
21 slides 16 and 17.

22 CHAIRMAN WALLIS: Okay.

23 MR. KOSHY: We presented this to CRGR.  
24 And CRGR asked us to do two improvements on the  
25 generic letter: to bring the focus on the power

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1 cables itself and also to add a safety-related example  
2 to show the significance of this failure on a plant.  
3 In the package that you have received, we have  
4 incorporated those changes.

5 We received the NEI white paper much after  
6 the comment period on May 1st. I have addressed the  
7 highlights in this coming couple of slides. One is a  
8 graded approach. Again, the number that you see on  
9 the top is the sections that correspond to the NEI  
10 white paper, 6.6.

11 The graded approach for monitoring and  
12 replacement of cables, the bullets are many cables do  
13 not power safety-related equipment; and the other one,  
14 graded approach to replacement and monitoring is best  
15 for safety and business reasons.

16 Our response is that we are only focusing  
17 on those that are significant. That's the very reason  
18 that we are using to bring the scope down to the  
19 maintenance rule. And we mentioned certain systems in  
20 there because to, let's say, overcome the variances  
21 and interpretations on that rule and also because  
22 those examples that we state there are the ones that  
23 have most impact on the plant in the sense affecting  
24 multiple systems.

25 Therefore, these are classified as most

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1 important because of these reasons. And, therefore,  
2 you know, it will be important to prevent the  
3 transients and also in supporting of mitigating the  
4 accident.

5 So that's how we have narrowed the scope  
6 and as to bringing down to only important cables and  
7 not all of the cables at large. And the numbers that  
8 you see in that white paper are some plants have like  
9 300-plus cables. And that won't be within the scope  
10 of maintenance rule.

11 The next one, the recommendations again in  
12 chapter 8, is provide dry environment, prepare for  
13 cable failures, and share failure resolutions.

14 Providing a dry environment -- again, you  
15 know, these are all installed cables. It's not quite  
16 practical. And pumping out would help. It will slow  
17 down the failure, but it cannot prevent the failure.  
18 It may take a little longer. And these cable failures  
19 could affect many systems. And the replacement of  
20 these cables is very time-consuming.

21 So if you have a valid accident mitigation  
22 method and at that time trying to make this cable  
23 replacement could be very difficult because the cables  
24 that run in the same duct banks could be helping the  
25 accident mitigation at that time. And your cable

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1 pulling and taking bus outages would not be desirable  
2 actions when you run into an accident environment or  
3 facing a LOOP or a station blackout.

4 And the technique is available there to  
5 have that reasonable confidence so that we can rely on  
6 these cables for continued operation.

7 That's all we have prepared for presenting  
8 to you. And if you have --

9 MEMBER BONACA: I have a question --

10 MR. KOSHY: Sure.

11 MEMBER BONACA: -- regarding in the  
12 generic letter, you talk about 23 LERs --

13 MR. KOSHY: Right.

14 MEMBER BONACA: -- and two monitor  
15 reports. Then the letter says that you believe that  
16 this is a very small fraction. That is the word used  
17 in the LER in the generic letter, a very small  
18 fraction of the actual failure to take place, which  
19 tells me that the number of failures that happen may  
20 be in the hundreds.

21 What is the projection? What does it mean  
22 that 25 in total is a very small fraction?

23 MR. KOSHY: It's very difficult to make  
24 such an estimate, but let me give a personal  
25 experience that I know of. I was at an AIT for a

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1 plant where they had such a cable failure. At that  
2 time they had six cable failures already when we had  
3 the AIT in the mid '80s. So that is repeated failures  
4 happening at one plant.

5 MEMBER BONACA: Okay.

6 MR. KOSHY: Again, I know of another  
7 Northeastern plant where they have all of these  
8 service water cable and emergency service water cables  
9 going through manholes. And they had splices in that  
10 also. And this manhole gets filled with water. And  
11 when the manhole cover knocks out, that's when you  
12 find out the splice failed. They had also quite  
13 repeated failures.

14 So certain plants may have a higher  
15 susceptibility because of groundwater and the design  
16 uniqueness. There may be some plants in absolutely  
17 dry environment, like WNP 2 in the middle of the  
18 desert. They may not have any cable problems because  
19 it's always dry. and if it all drains, it dries out  
20 so fast. So some plants may be fully exempt from this  
21 problem.

22 If the water table is a guide, those are  
23 the ones where you have high susceptibility and  
24 failures. And some plants are kind of glaringly  
25 different than others.

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1                   MEMBER BONACA: The information you are  
2 requesting is regarding all cables, right, not only  
3 those in a weather condition?

4                   MR. KOSHY: All cables and inaccessible.

5                   MEMBER BONACA: Inaccessible.

6                   MR. KOSHY: Yes.

7                   MEMBER BONACA: Exactly. Okay.

8                   MR. KOSHY: So plants where they did not  
9 have failures would not have anything to report. But  
10 if you had failures, we would like to know them --

11                   MEMBER BONACA: Yes.

12                   MR. KOSHY: -- so that we can kind of  
13 gauge, you know, are there repeated problems, what are  
14 the vulnerabilities, and based on that probably share  
15 the lessons and see if you have to take further  
16 action. Maybe it's down to a few plants. We do not  
17 know that because we lack the data to support that.

18                   And the NEI white paper data shows about  
19 15 plants having about 45 to 50 failures. That could  
20 be an indication because they focused on underground  
21 and medium voltage only.

22                   MEMBER BONACA: But your monitoring  
23 program that you're talking about doesn't deal only  
24 with cables that failed. It deals with cable aging  
25 that may be operable during functional testing that

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1 failed during demand, service.

2 So how are you going to gather information  
3 regarding these kind of cables?

4 MR. KOSHY: Okay. What we are saying is  
5 if those cables are within the scope of maintenance --

6 MEMBER BONACA: Yes.

7 MR. KOSHY: -- and they're underground and  
8 inaccessible, tell us if you have failures. And do  
9 you have a program when they have this susceptibility  
10 for failure to make sure that it wouldn't fail?

11 MEMBER BONACA: I understand.

12 MR. KOSHY: So you're not on the scope.  
13 Tell us what the failure is. And see how you monitor.

14 MEMBER BONACA: Right.

15 MEMBER ARMIJO: I have a question. How  
16 can you have a failure of above-ground inaccessible  
17 cable without water? Is it --

18 MR. KOSHY: Okay. What happens is, you  
19 know, even in some large conduit connections which go  
20 on the surface because of the variance, you get  
21 condensation built in there unless you have a way of  
22 venting it out.

23 MEMBER ARMIJO: Well, it could be a  
24 significant amount of water.

25 MR. KOSHY: You could collect all the

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1 time.

2 CHAIRMAN WALLIS: You get a humid day and  
3 a cold night.

4 MR. KOSHY: For the condensation and --

5 MEMBER SIEBER: You can get cable failures  
6 from things other than water.

7 MR. KOSHY: Yes, other chemicals and other  
8 leeching, yes.

9 MEMBER SIEBER: Chemicals, overheating.  
10 You know, that degrades insulation or defect in  
11 splices, for example, if --

12 MR. KOSHY: Yes. Splices is another  
13 vulnerable point.

14 MEMBER SIEBER: It's handmade.

15 MEMBER MAYNARD: A couple of questions.  
16 On the provided inscription of the frequency of all  
17 inspection testing, monitoring, are you talking about  
18 what is currently in place or are you asking the  
19 licensee to go back to day one for all of what testing  
20 has been done?

21 MR. KOSHY: We are asking for what you  
22 have in place now so that you can put in place such  
23 unanticipated failures.

24 MEMBER MAYNARD: Okay. And the other  
25 thing is, is the staff coordinating in any way? This

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1 is requesting this information to be within 90 days.

2 MR. KOSHY: Right.

3 MEMBER MAYNARD: And it would appear to me  
4 that if the other generic letter on the spurious  
5 actuation gets issued, a lot of the same resources  
6 could be required or needed for a lot of these  
7 activities, both dealing with electrical circuits,  
8 just --

9 MEMBER SIEBER: This one is pretty --

10 MR. KOSHY: We will work with the Generic  
11 Communications Division so that we would be sensitive  
12 to that.

13 CHAIRMAN WALLIS: So what are you going  
14 with the information when you get it?

15 MR. KOSHY: What we are hoping is that  
16 depending on, let's say, the breadth and depth of the  
17 problem as to why widespread, we may have to think of  
18 NRC action if that warrants it. We have --

19 CHAIRMAN WALLIS: You think that there  
20 might be some problem. You have this sort of you  
21 almost call it a fishing expedition, where you get all  
22 of this information. And then you look at it and say,  
23 "Aha. Now we have to do something or not." You're  
24 not quite sure what you are going to find.

25 MR. KOSHY: Okay. We know it is a

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1 significant problem in the light of what I explained  
2 to you.

3 CHAIRMAN WALLIS: There have been events,  
4 right.

5 MR. KOSHY: Yes. We have been having  
6 events, which either the plant is out or disabled  
7 safety systems. And those things kind of give you a  
8 flavor of significance.

9 CHAIRMAN WALLIS: But the result of all of  
10 this information gathering might be that you decide  
11 everything is okay as it is now.

12 MR. KOSHY: If the industry has, let's  
13 say, commitments to prevent such failures, yes. But  
14 if you are seeing failures and repeated failures, we  
15 have to rethink what we should be doing. Okay? We  
16 are not there yet. We need to --

17 MR. MAYFIELD: Professor Wallis, this is  
18 Mike Mayfield from the staff. As we assess the  
19 results we get back from this, we would have to make  
20 a decision whether generic action is warranted or is  
21 there some plant-specific action that is warranted or  
22 things are being managed appropriately as it is. And  
23 we just don't know until we get the results back. We  
24 have enough indicators to make us believe that we need  
25 to go --

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1 CHAIRMAN WALLIS: I think the industry  
2 response to the public comments was everything is  
3 fine, we're doing the right thing now. You just want  
4 the assurance that it really is so.

5 MR. MAYFIELD: That might be the outcome.  
6 And we'll have to see what actually comes in.

7 MEMBER SIEBER: The third question sort of  
8 tips your hand as to what you want. And it says if a  
9 monitoring or surveillance program is not in place,  
10 explain why such a program is not necessary.

11 In other words, here's a plant with  
12 failures. And they're not testing anything.

13 MR. MAYFIELD: We might want to chat with  
14 them a bit.

15 MEMBER SIEBER: You gave them the hint.  
16 You ought to test something.

17 MEMBER BONACA: Or you may have a plant  
18 where there have been no failures and you have no  
19 significant power equipment. Then why should you even  
20 have a test? I mean, then you have a threshold for  
21 saying, "We don't need it."

22 MEMBER MAYNARD: I've got a feeling when  
23 you get all of this, the actual number of failures if  
24 you divide it by the number of plants and the number  
25 of operating years wouldn't look that great, but when

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1 you go to group them, there may be some areas where  
2 you --

3 MR. MAYFIELD: Exactly. And that is not  
4 an uncommon outcome from getting this kind of  
5 information.

6 MR. KOSHY: One thing you find out is the  
7 data that we have at this time is based on normal run  
8 and surveillances, not an extended use of like two,  
9 three weeks. So what we are trying to see is gain  
10 confidence that these cables can continue in service  
11 for two or three weeks if there is a station blackout  
12 or some reason and we can continue to rely on these  
13 cables for that safety function.

14 MEMBER BONACA: Yes. That is a very  
15 important issue, you know, the failure to run. So the  
16 equipment starts, but then it won't run for as long as  
17 it has to. And that's trickier because, I mean, the  
18 number of failures experienced to date doesn't give  
19 you a specific insight on these cables. And that's  
20 their function.

21 MR. KOSHY: Right.

22 MEMBER BONACA: Any additional questions?

23 (No response.)

24 MEMBER BONACA: If not, I thank you for  
25 the presentation.

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1 MR. KOSHY: Thank you.

2 MEMBER BONACA: I think Mr. Marrison of NEI

3 --

4 MR. MARRION: Yes.

5 MEMBER BONACA: -- would like to make a  
6 statement. NEI, of course, produced that white paper  
7 that is quite interesting on this issue.

8 MR. MARRION: Good afternoon. I'm Alex  
9 Marrison, the Senior Director of Engineering at NEI.

10 I do have a couple of comments I want to  
11 make about basically what we heard. We haven't seen  
12 the staff disposition of the public comments that have  
13 been submitted. Nor have we seen the current version  
14 of the proposed generic letter.

15 But I have to tell you I am confused. And  
16 the reason for that confusion is that a couple of  
17 years ago, I received a letter from the Electric  
18 Systems Branch Chief articulating concern with a  
19 potential common mode of medium voltage cables. And  
20 the common mode failure mechanism was water training.  
21 This was based upon a review of 20-some odd licensee  
22 event reports.

23 We had a public meeting with the staff to  
24 understand, get a little more of an understanding of,  
25 their concerns. And we looked into the licensee event

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1 reports, and they had -- I'm trying to remember. I  
2 think there was only one or two that had a potential  
3 for being related to the water-training phenomenon  
4 that the staff was concerned with.

5 But it became clear to us that we needed  
6 to develop a document that would be an educational  
7 piece, if you will, primarily focusing for the  
8 industry, but we also felt that the NRC could possibly  
9 benefit from it. And that was the basic objective for  
10 the white paper that we developed.

11 The purpose for the educational piece was  
12 to articulate a clear understanding of the  
13 water-training phenomenon to articulate our assessment  
14 of the licensee event reports that the staff was using  
15 as a basis --

16 CHAIRMAN WALLIS: You're talking about a  
17 water-training phenomenon?

18 MR. MARRION: Water training, yes.

19 CHAIRMAN WALLIS: Training. Oh, I'm  
20 sorry.

21 MR. MARRION: Yes, water training. I'm  
22 sorry. I've got a cold, and I'm a little congested.  
23 I apologize.

24 CHAIRMAN WALLIS: That's my  
25 misunderstanding. I'm sorry.

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1 MR. MARRION: -- and also provide us a  
2 technically based understanding of the application of  
3 that phenomenon to basic cable configurations and  
4 insulation systems that exist in the power plants  
5 today or not in the power plants but exist in these  
6 applications today.

7 We concluded that you can't make a general  
8 statement that water training is of concern because  
9 it's not applicable to every cable configuration and  
10 insulation system that's in the field today.

11 It appears that the staff is attempting to  
12 require a cable-monitoring program. I'm not familiar  
13 with the details of the maintenance rule, but I know  
14 that the equipment to which these cables are  
15 terminated are monitored in the maintenance rule.

16 And since the cables aren't active  
17 components, I'm not sure whether they should be  
18 included in the maintenance rule or not. But  
19 fundamentally if the staff expectations and basis in  
20 this generic letter are not clear, you have the  
21 potential of a generic letter basically undermining a  
22 regulation.

23 I don't know if the staff has done a  
24 review with the maintenance rule folks within NRR, but  
25 I would recommend that be done before this is

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1 submitted.

2 CHAIRMAN WALLIS: You're implying this,  
3 but, in fact, they just say they're gathering  
4 information. And it's not clear that they intend to  
5 do anything which would change the regulation in any  
6 way or interfere with regulation. You don't know what  
7 they're going to do.

8 MR. MARRION: And the licensee has to  
9 document a justification of why they don't have a  
10 cable-monitoring program. That is --

11 CHAIRMAN WALLIS: But you're implying that  
12 something downstream is going to require this. That's  
13 not actually a --

14 MR. MARRION: No. I'm implying there may  
15 be a conflict between what the generic letter is  
16 asking for and what is required by the --

17 CHAIRMAN WALLIS: You're asking for  
18 information, rather.

19 MR. MARRION: Well, okay. That's one way  
20 of looking at it. It is a request for information or  
21 an attempt to require a cable-monitoring program. And  
22 I'll let you folks decide how you want to do that if  
23 they want to interpret that.

24 I think that, you know, the staff has made  
25 some comments about, you know, what their concern is.

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1 And it's not clear to me. I have to tell you I'm  
2 confused. Maybe it's because of our involvement over  
3 the past several years, but I have yet to see any kind  
4 of risk analysis or any kind of statistical analysis  
5 conducted by the NRC to articulate some level of  
6 confidence that they find unsatisfactory relative to  
7 the performance of the cable or the equipment.

8 We have attempted to do some statistical  
9 work in our white paper based upon the survey that we  
10 had conducted. I'm not happy with the fact that we  
11 didn't get 100 percent of the utilities to respond,  
12 but we got on the order of 80 percent, I think, 79.  
13 something. That has some benefit.

14 My concern at this particular point is  
15 when the generic letter is finally issued, based upon  
16 what I heard this afternoon, we're going to have to  
17 request a meeting, a public meeting, and probably  
18 document further clarification of what the NRC is  
19 really interested in this information request as they  
20 go forward because it's not clear at this particular  
21 point in time. And that's all I have to say. I would  
22 be more than happy to answer any questions you may  
23 have.

24 (No response.)

25 MR. MARRION: Okay. Thank you.

1 CHAIRMAN WALLIS: You're welcome.

2 You were suspicious that if they gather  
3 this information, then they might use it to require  
4 something which they wouldn't be able to do if they  
5 didn't have the information?

6 MR. MARRION: No. It's not clear what  
7 concern is trying to be addressed by the request for  
8 information.

9 CHAIRMAN WALLIS: Well, the concern is  
10 that these cables will fail. It's a simple concern.

11 MR. MARRION: Well, where does that  
12 concern stop? Do you stop at these cables or do you  
13 continue that concern at the equipment, et cetera,  
14 that is under continuous surveillance programs and  
15 testing? I mean, where does it end?

16 And it's a concern about having possible  
17 unanticipated failures? Well, where do you stop  
18 asking that question now that you started on medium  
19 voltage cables and the small population of medium  
20 voltage cables, I suspect?

21 So there are some real issues that have to  
22 be addressed here because the utilities are going to  
23 want to be responsive to the generic letter. My job  
24 is to make sure that we understand it adequately so  
25 the utilities will be responsive, but right now I'm

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1 not sure we have that understanding.

2 MEMBER BONACA: Well, if I understand it,  
3 I mean, the issue has to do with two things. One is  
4 inaccessible equipment that cannot be visually or  
5 other means inspected -- so it's a very narrow family  
6 -- and then equipment that is really in accepted  
7 applications.

8 And clearly equipment is seeing a water  
9 condition or wetness that -- so it's a pretty unique  
10 and narrow population, but I think at least I am  
11 interested to know what kind of equipment is being  
12 powered by this kind of cable out there. And if it is  
13 something critical, a generic letter or whatever,  
14 connection to off-site power, you know, it's a unique  
15 concern.

16 I mean, we addressed it and discussed it  
17 during license renewal because it was significant.  
18 And the industry and the NRC worked together on a goal  
19 inspection program for those cables.

20 And where does the aging start? I mean,  
21 does it start with a theatre of operation or does it  
22 start before? Clearly there is degradation taking  
23 place at some point. I realize I don't know all there  
24 is necessary to know about that.

25 MR. MARRION: If I may just offer a couple

1 of comments?

2 MEMBER BONACA: Yes?

3 MR. MARRION: The aging phenomenon begins  
4 from the time that the cable is shipped from the  
5 manufacturer's facility.

6 MEMBER BONACA: That's right.

7 MR. MARRION: And it's exacerbated by  
8 environmental conditions as well as operational  
9 conditions that wind up stressing the cable insulation  
10 system. And a submerged, wetted environment for  
11 certain insulation systems has the potential of  
12 increasing the aging or the rate of aging degradation,  
13 et cetera. That is well-known.

14 The equipment that's affected here  
15 includes diesel generators at some plants at 4,000 or  
16 4,160 volts as well as other plants at 6.9 kV. I  
17 don't know about -- I think one of the staff was --  
18 Tom made a comment about some diesel generators  
19 operating in the 480 volts. If that's indeed the  
20 case, then that's indeed the case.

21 But mean voltage cable in the industry is  
22 characterized as 2,000 to 15,000 volts. So I'm hoping  
23 that the generic letter will be very clear of  
24 articulating the 480-volt applications. And is it  
25 only for that particular piece of equipment or is it

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1 for something else? That's one of the points of  
2 clarity that's needed.

3 We tried to capture in our white paper --  
4 and I hope you've read it; we've made it available to  
5 you -- the current state of understanding of cable  
6 insulation systems at this voltage level and  
7 underground applications and which insulation systems  
8 are susceptible to water damage over time.

9 We have encouraged the utilities to  
10 prepare for such failures because if you look at the  
11 age of the fleet, we are approaching the end of  
12 service life of a lot of these cables. It's typically  
13 30, 35, 40 years based upon normal environmental  
14 conditions.

15 And our recommendation to the industry was  
16 don't wait for a failure before you have to deal with  
17 this problem because this is not the kind of cable  
18 that you typically keep large quantities in inventory  
19 at the warehouse, et cetera. And if you're not  
20 prepared, you will have an extended outage should you  
21 have such a failure.

22 I don't know if the generic letter is  
23 going to speak to that, but I also know that there is  
24 not a cable-monitoring system that is applicable and  
25 effective and available to the utilities today.

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1           There are some testing techniques that are  
2 effective for certain kinds of insulation  
3 configurations. And our white paper speaks to that.  
4 But based upon the information I have gotten from  
5 EPRI, who is pursuing research in this area, et  
6 cetera, that there isn't one technique that would be  
7 useful. So okay?

8           MEMBER BONACA: Thank you.

9           MR. MARRION: Thank you.

10          MEMBER BONACA: Yes. I think we're  
11 scheduled for some closing remarks. Is there?

12          MR. MAYFIELD: Just very briefly. We  
13 believe we have articulated why we need the generic  
14 letter. If indeed there is substantive confusion or  
15 misunderstanding once we have published the generic  
16 letter, we would, as always, be more than willing to  
17 meet with the industry and make sure that there is a  
18 common understanding of what we're asking for.

19                 This generic letter has been in process  
20 for a while. And we do believe we need to move  
21 forward to get the generic letter published and allow  
22 licensees the opportunity to engage with it. We will  
23 be mindful of any conflicts with other generic  
24 communications that are going forward where we may be  
25 imposing unreasonable time constraints and resource

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1 constraints on the licensees. That's something that  
2 we will pay attention to and go back and pulse with  
3 the generic communication staff and the other  
4 technical staff to make sure we're online there.

5 With that, unless the Committee has other  
6 questions for the staff, I believe we have presented  
7 to you the information that we wanted to present. And  
8 we look forward to receiving a letter from you. Thank  
9 you.

10 MEMBER BONACA: Any other questions for  
11 Mr. Mayfield?

12 MR. FALLON: I have a question. Mike  
13 Fallon with Constellation Energy.

14 For the license renewal applicants that  
15 have submitted under the GALL report, these cables are  
16 all in the scope of license renewal, have been  
17 addressed in their applications. Are they being asked  
18 to resubmit this information again?

19 MR. KOSHY: This is Thomas Koshy.

20 This generic letter will fall under the  
21 Part 50 program, in which case we are addressing,  
22 let's say, something more than what was addressed in  
23 the renewal program. So there is a need for making  
24 separate submittal to the NRC in response to this  
25 generic letter.

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1 MR. FALLON: All of the cables that you  
2 have addressed, all of the safety-related cables, are  
3 in the scope of license renewal. And whether they're  
4 480-volt or they're medium voltage, they're addressed  
5 in those applications.

6 MR. MAYFIELD: Okay. Let me comment.  
7 This is Mike Mayfield from the staff.

8 You raise a good point. It is something  
9 we will look at and make sure we're not asking you to  
10 unnecessarily duplicate information. But that is a  
11 fair question, something that we'll make sure that --

12 MEMBER BONACA: Well, I am not aware that  
13 license renewal applications have the summary of all  
14 of the failures that have taken place. We are going  
15 to get to the information.

16 MR. MAYFIELD: We don't think we are in  
17 conflict, but it's a fair question. And we'll look to  
18 make sure we are not asking an unreasonable question.

19 CHAIRMAN WALLIS: But you will be looking  
20 at plants which doesn't necessarily have license  
21 renewal in prospect.

22 Are we through with this item now or --

23 MEMBER BONACA: Are there additional  
24 questions for the staff, for industry, for us?

25 (No response.)

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1 MEMBER BONACA: If none, I think it's  
2 over.

3 CHAIRMAN WALLIS: Thank you.

4 MEMBER BONACA: And we open it up back to  
5 you, Mr. Chairman.

6 CHAIRMAN WALLIS: Now, I really am  
7 reluctant to take a break for an hour. I wonder if we  
8 couldn't work on -- is it okay, staff who is an expert  
9 on this? Can we work on Mario's letter on this issue  
10 right now on just a preliminary basis?

11 Let's go off the record and work on his  
12 letter for half an hour or an hour.

13 MEMBER SIEBER: We have to come back.

14 CHAIRMAN WALLIS: Can we do that? You're  
15 not ready? We do have a draft letter. Will the  
16 Committee agree to work on his letter? We can discuss  
17 it now, but I think we can go off the record and  
18 discuss our reaction to this generic letter and work  
19 on our letter until about 3:00 o'clock. Is that okay  
20 with the Committee?

21 So let's do that. We'll come off the  
22 record now, and we will work on this letter until  
23 about 3:00 o'clock. We'll have some discussion now  
24 off the record.

25 (Whereupon, the foregoing matter went off

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1 the record at 2:25 p.m. and went back on  
2 the record at 3:18 p.m.)

3 CHAIRMAN WALLIS: We will come back on the  
4 record, come back into session.

5 CHAIRMAN WALLIS: The next item on the  
6 agenda is, let's see now, interim staff guidance. Is  
7 that what it is?

8 MEMBER BONACA: Yes.

9 CHAIRMAN WALLIS: And I will again call on  
10 Mario Bonaca to lead us through this one.

11 MEMBER BONACA: Okay.

12 4) INTERIM STAFF GUIDANCE AGING MANAGEMENT PROGRAM

13 FOR INACCESSIBLE AREAS OF BOILING WATER REACTOR

14 (BWR) MARK I CONTAINMENT DRYWELL SHELL

15 4.1) REMARKS BY THE SUBCOMMITTEE CHAIRMAN

16 MEMBER BONACA: We have the staff here to  
17 provide us with an overview on the proposed license  
18 renewal interim staff guidance on steel containment of  
19 BWR Mark I containments.

20 We have reviewed a number of BWRs. And  
21 we have often asked the question on the status of the  
22 steel liner. And we have seen different proposals by  
23 licensees, some of them planned inspections, only  
24 metric inspections. Some of the others don't.

25 And the staff is using a successful

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1 process that has been successful in most of the  
2 license renewal applications to date, the ISG process,  
3 as a means of proposing an approach that they expect  
4 the licensees to follow regarding this particular  
5 item.

6 And so the staff has come here to give us  
7 an overview of this process and what they are  
8 proposing to do. And I will let the staff go ahead.  
9 I don't know if Mr. Gillespie or Mayfield --

10 MR. GILLESPIE: Yes. If I could, just  
11 some opening comments to put in context what Linh and  
12 Hans are going to go through. Not only did we do a  
13 couple already, but we've got something like seven  
14 Mark I's lined up in the queue. And we have a number  
15 of very controversial ones in New Jersey,  
16 Massachusetts, and Vermont, where there is actually a  
17 lot of public interest. And we had no position on the  
18 liner itself.

19 There are some caveats or I'm going to say  
20 some wiggle room in this position I'd like to  
21 highlight to the Committee by way of how the staff is  
22 approaching this because a question at the meeting  
23 yesterday at Monticello was, why is it different plant  
24 to plant if you're trying to apply a consistent  
25 approach.

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1           This is kind of an approach for the plant  
2           that's got almost like the optimum conditions, of  
3           which Monticello with their leakage control programs  
4           and some things they were doing was.

5           Browns Ferry, an earlier one, which  
6           committed to doing some other measurements, actually  
7           had an operating history of having leaks. And so they  
8           had moisture content in there. And so we actually  
9           have -- this is a minimum condition, as we would look  
10          at it.

11          And there are also some wiggle words,  
12          quite honestly, in this. And that's where it says  
13          first you have to establish a degradation rate,  
14          basically. And then if you get moisture, this  
15          basically treats moisture in the outside of the shell  
16          the same as visible accelerated corrosion on the  
17          inside.

18          And we're using the ASME code kind of  
19          enhanced inspection, but, instead of referencing the  
20          code, we described the enhanced inspection in it in  
21          case the code changes in the future.

22          So we're bringing definition to an  
23          equivalence to inside and outside indications. And  
24          there is still a lot of room on how you establish the  
25          rate and what is the credibility of the rate.

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1           And so if you have a history as a facility  
2 of having leakage and, therefore, moisture in there,  
3 then I think the Committee should expect the staff in  
4 establishing the rate in those wiggle rooms because it  
5 says if you have moisture, reestablish your rate again  
6 -- and the only way to factually reestablish the rate  
7 is likely do a UT measurement and then connect the  
8 dots again. Literally a simplistic way of looking at  
9 it is a regression line between the now additional  
10 point.

11           And so Hans in his efforts as a reviewer  
12 still has a lot of room in what are the uncertainties  
13 in establishing the rate. And it's those  
14 uncertainties which kind of differentiate one plant  
15 from another. How do you reduce those uncertainties  
16 given different operating histories?

17           And so that's really how come Monticello  
18 is different from Browns Ferry. It's strictly  
19 operating history and the uncertainty involved with  
20 known moisture leak on multiple occasions.

21           So, with that, let me turn it over to Linh  
22 because that's just kind of the context. Linh, take  
23 it away.

24           4.2) BRIEFING BY AND DISCUSSIONS WITH  
25           REPRESENTATIVES OF THE NRC STAFF

1 MS. TRAN: Good afternoon. My name is  
2 Linh Tran. And I'm the Project Manager with the  
3 Division of License Renewal. And this is Hans Ashar.  
4 He's a senior civil engineer with the Division of  
5 Engineering.

6 We are here this afternoon to present the  
7 proposed license renewal interim staff guidance for  
8 the inaccessible area of the BWR Mark I drywell  
9 containment shell.

10 The purpose of this ISG is to provide  
11 guidance to future applicants on the information that  
12 is needed to be included in the license renewal  
13 applications for addressing the inaccessible area of  
14 the drywell shell.

15 Now, the proposed ISG here does not impose  
16 any no new technical requirement. And in previous  
17 license renewal application review by the staff, we  
18 usually can obtain the information in the applications  
19 or through the request for additional information.  
20 And usually we will get the information from the  
21 applicant.

22 The information provided by the applicant  
23 is sufficient for the staff to make its determination.  
24 However, it is not the most efficient way because of  
25 the RAI back and forth. And in an effort to reduce

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1 the number of RAIs, this proposed ISG would identify  
2 the information up front, so for the future  
3 applicants, what they should include in the LRAs, I  
4 guess, to make the staff review more efficient,  
5 information such as inspection results or analysis  
6 that would help the staff make the determination  
7 whether the containment would perform its intended  
8 function for the period of extended operation.

9 Past operating experience in the Mark I  
10 steel containments indicate that when water is  
11 discovered in the bottom outside area of the drywell  
12 shell, the most likely cause could be the water  
13 seeping through the inaccessible area.

14 And in slide 10 in your handout, I have a  
15 picture of the drywell shell. It is an inverted light  
16 bulb. That indicates where the inaccessible area  
17 would be.

18 And this area is the area for the distance  
19 between the drywell shell -- did you do slide 10?;  
20 that's a picture there; yes -- where the surrounding  
21 concrete structure is too small for successful  
22 performance of visual inspection. That's the area  
23 right there. The gap is usually two inches, three  
24 inches.

25 CHAIRMAN WALLIS: You used the term

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1 "seeping." It's really any water that gets there from  
2 any reason whatsoever.

3 MS. TRAN: Correct.

4 CHAIRMAN WALLIS: And "seeping" is used as  
5 a general term.

6 MS. TRAN: Term, correct.

7 CHAIRMAN WALLIS: It may not seep. It may  
8 actually flow or --

9 MS. TRAN: Flow through, right.

10 MR. ASHAR: The area that we are  
11 concentrating on is between the shell, between the  
12 shell and the concrete in the back, in between the  
13 insulation --

14 MEMBER BONACA: No, no, no.

15 MR. ASHAR: Oh, I'm sorry. Wrong place.

16 MS. TRAN: Right. That's --

17 MEMBER APOSTOLAKIS: It is between what  
18 and what?

19 MR. ASHAR: Between the freestanding steel  
20 containment --

21 MEMBER BONACA: Between the light bulb and  
22 the --

23 CHAIRMAN WALLIS: There's a space right  
24 there.

25 MR. ASHAR: And mostly it is filled with

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1 insulation.

2 MEMBER APOSTOLAKIS: How does the water  
3 get there?

4 MR. ASHAR: Water gets into -- I'm going  
5 to explain. There are three basic sources of water  
6 that we have seen so far in the operating history.  
7 One can be called because of the -- we don't have any  
8 picture of the actual area.

9 MS. TRAN: No. This is it.

10 MR. ASHAR: This is it. In this area,  
11 there are bellows, bellows between the driver.

12 CHAIRMAN WALLIS: We saw them this  
13 morning.

14 MR. ASHAR: Yesterday you may have seen  
15 it, yes. And those bellows can crack. And then they  
16 can give a seepage into the trough, which collects the  
17 water.

18 Now, if the drain, which is supposed to  
19 drain out all the water from there, is full or is not  
20 working properly, the water can accumulate in the  
21 trough area, which has been kept just for that  
22 purpose. And it may all flow in coming to this area  
23 here.

24 CHAIRMAN WALLIS: It's lower.

25 MR. ASHAR: Because it is not showing

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1 better this particular detail, this is not good  
2 enough. Yesterday it was a very nice picture here.

3 CHAIRMAN WALLIS: But in order to refuel,  
4 you have to flood the upper region there.

5 MR. ASHAR: That is correct.

6 CHAIRMAN WALLIS: And some of that water  
7 can get down on the outside.

8 MEMBER APOSTOLAKIS: Okay. Thank you.

9 MS. TRAN: Now, in this --

10 VICE CHAIRMAN SHACK: Now, is that the  
11 only source of the water, I mean?

12 MR. ASHAR: No, no. There are two or  
13 three we found so far. Okay? One is a cracking of  
14 bellows. Second one is there is a refueling seal  
15 between the bottom of the trough, concrete trough.  
16 And there is a systematic way of draining it out  
17 through a drainage. But drain gets clogged. And the  
18 water comes through that area. It collects in the  
19 trough again and goes into between the concrete and  
20 the drywell shed.

21 Clog one is the reactor cavity wall. You  
22 have a stainless steel liner on it. And stainless  
23 steel liner gets -- they may do for any reason. And  
24 the water goes directly from concrete into that gap in  
25 between the two.

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1                   These are three reasons we have identified  
2                   so far.

3                   CHAIRMAN WALLIS:   So what clogs this  
4                   drain?  You said the drain gets clogged?

5                   MR. ASHAR:  It is because of negligence on  
6                   the part of the various --

7                   CHAIRMAN WALLIS:  Yes.

8                   MR. ASHAR:  -- not to monitor them  
9                   correctly.  Now they have come to their senses.  And  
10                  they started telling us they are monitoring, they are  
11                  doing this, they are doing that.

12                  MEMBER BONACA:  The drains are down from  
13                  the sand cushions, right?

14                  MR. ASHAR:  They are separate.  After the  
15                  water leakage, it is the sand cushion area.  Then  
16                  there are drains to -- actually, those drains were  
17                  meant for making sure the scent does not go away.  And  
18                  if it is, then they can collect them and put them back  
19                  the same.  That was the whole idea behind it.

20                  But it has been used nowadays as a  
21                  water-collecting/catching kind of a thing.  It is an  
22                  indirect function of that particular drain, but that  
23                  shows that water is coming in.  If the drains into  
24                  that room, if it shows any kind of water in the Torus  
25                  room, then it shows that there is a water leakage from

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1 somewhere up above that is getting into that area.

2 CHAIRMAN WALLIS: It drains into the room  
3 around the Torus? It just drips down the wall  
4 somehow?

5 MEMBER SIEBER: Yes.

6 MR. ASHAR: The water comes from here.

7 CHAIRMAN WALLIS: That is a four-inch  
8 drain pipe. It just drains down the wall?

9 MR. ASHAR: This is a sand pocket here.

10 CHAIRMAN WALLIS: Where does it go to when  
11 it drains out of that four-inch drain pipe?

12 MEMBER SIEBER: Onto the floor.

13 CHAIRMAN WALLIS: It just drains onto the  
14 floor?

15 MR. ASHAR: Unless they are collectors.  
16 Some people have started collecting them into some  
17 kind of a jar. But most of them, yes, it was going  
18 onto the floor.

19 MS. TRAN: It goes onto the floor, yes.

20 MR. ASHAR: There is where they find out.

21 MEMBER BONACA: Now, some licensees have  
22 the drainage and some don't. That depends on the --

23 MR. ASHAR: Well, some licensees have  
24 drains of the sand pocket area here.

25 MEMBER BONACA: Down at the low point.

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1 MR. ASHAR: Some people have drains at  
2 this area somewhere on the top of it.

3 MEMBER SIEBER: I think all of them --

4 MR. ASHAR: And if it is on the top of it,  
5 then there has to be sealing between --

6 MEMBER SIEBER: All of them have the top.

7 MR. ASHAR: -- the concrete and the --  
8 yesterday we saw in the Monticello case, it was a  
9 seal, which was a galvanized steel shield between the  
10 sand pocket area and the above area. So it prevents  
11 the water from getting in.

12 MEMBER BONACA: The had a few ounces of  
13 water, too, at some point.

14 MR. ASHAR: Yes, yes.

15 MEMBER BONACA: So they must have come  
16 also from the top.

17 MR. ASHAR: In the case of Monticello,  
18 there were no signs like that. We did not see.

19 MEMBER BONACA: There were only a few  
20 ounces of water, they said.

21 MEMBER MAYNARD: Yes, but they speculated  
22 that that water had actually come from another source  
23 because of the two or three-inch sand pipe there.

24 MEMBER BONACA: On the sand pipe there,  
25 yes.

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1 MR. ASHAR: They could explain when you  
2 ask that question.

3 CHAIRMAN WALLIS: Well, if it drains down  
4 that four-inch drain pipe, I would assume that the  
5 sand is full of water.

6 MEMBER SIEBER: Yes.

7 MEMBER MAYNARD: Right. That is not the  
8 low point.

9 CHAIRMAN WALLIS: There is a lot of water  
10 there before it drains down the pipe. The sand  
11 pocket, the sand --

12 MR. ASHAR: The sand pocket has to be  
13 sucked up completely.

14 CHAIRMAN WALLIS: The sand cushion is  
15 saturated with water first.

16 MR. ASHAR: Right.

17 MEMBER SIEBER: A number of plants have  
18 drains at the bottom of the sand --

19 MR. ASHAR: At the bottom --

20 MEMBER SIEBER: It would make more sense  
21 to --

22 MR. ASHAR: Some people have at the bottom  
23 of the sand pocket area drains with -- again,  
24 actually, it is to retain the sand inside. So that  
25 all flowing sand can be collected, but if they can use

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1 it at the --

2 MEMBER SIEBER: What is the purpose of the  
3 sand in the first place?

4 MR. ASHAR: Okay. See, this is the --

5 MEMBER SIEBER: Got a cushion?

6 MR. ASHAR: -- concrete area -- okay? --  
7 here. And this one when the shell expands under  
8 pressure --

9 MEMBER SIEBER: It is room to --

10 MR. ASHAR: -- it gives you some room to  
11 budge in.

12 MEMBER SIEBER: Expand? Okay. But the  
13 whole bottom of the shell sits on concrete? So you  
14 don't worry about corrosion below the sand?

15 MR. ASHAR: We do in some cases. We do to  
16 some extent, yes. If --

17 MEMBER SIEBER: How do you address that?  
18 You can't get to it because the top of it is concrete,  
19 too.

20 MR. ASHAR: If there is an appreciable  
21 collection of water in the sand bucket area, there is  
22 a chance that the water might have gone between the  
23 steel shell and the concrete.

24 MEMBER SIEBER: Right.

25 MR. ASHAR: But those cases, we have not

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1 found many so far except one, one case.

2 MEMBER SIEBER: You probably don't know --

3 MR. ASHAR: Yes, sir.

4 MEMBER SIEBER: -- you've got a concrete  
5 pad, a hemispherical pad, and then concrete above  
6 that.

7 MR. ASHAR: Right.

8 MEMBER SIEBER: And so there's no way to  
9 make a measurement.

10 MR. ASHAR: We know.

11 MS. TRAN: The interior.

12 MEMBER SIEBER: You can't get to the  
13 inside unless you cut the concrete out.

14 MR. ASHAR: Unless you cut the concrete or  
15 there are some new methods that have been developed in  
16 the NRC's research program, which have guided matters,  
17 but they are not yet being calibrated and haven't been  
18 used extensively by anybody.

19 So there are potential uses for those  
20 things under these examinations, but we have not seen  
21 them use it so far. We have just put one report from  
22 Oak Ridge National Lab in e-mail items so that people  
23 can look at that report and see if it is applicable  
24 for them.

25 CHAIRMAN WALLIS: Didn't someone yesterday

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1 say they actually made holes in that concrete in order  
2 to inspect?

3 MR. ASHAR: Yes.

4 MS. TRAN: Monticello.

5 MEMBER SIEBER: Next to the pedestal.

6 MR. ASHAR: Yes. They had to do that.

7 MEMBER SIEBER: But that is about as far  
8 as you can go because --

9 MR. ASHAR: That is as far as you can go  
10 right now, right.

11 MEMBER SIEBER: It's really thick in  
12 between.

13 MR. ASHAR: Yes. You can go up to here in  
14 the sand pocket area. Anything below that, if there  
15 is a --

16 MEMBER SIEBER: Of course, the sump is in  
17 there, too.

18 VICE CHAIRMAN SHACK: But typically,  
19 though, I mean, your experience is that there is no  
20 water there or that they all collect water?

21 MR. ASHAR: Typically the water has been  
22 very little. There has been water except in one case  
23 in the case of, I think it is, Dresden III, when they  
24 had to put firewater in here to extinguish a fire in  
25 the gravel area here --

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1 VICE CHAIRMAN SHACK: Well, that would do  
2 it.

3 MR. ASHAR: -- because of a summation  
4 fire. I don't know why.

5 MEMBER SIEBER: Good place to get a fire.

6 MR. ASHAR: But there was a fire there.  
7 They put a lot of water into it. And this whole area  
8 becomes soft here in the sand --

9 CHAIRMAN WALLIS: I'm interested to see  
10 when the sand gets full of water by some mechanism how  
11 it ever gets out. How does it ever get dry?

12 MR. ASHAR: With sand you --

13 CHAIRMAN WALLIS: If you had water access,  
14 suppose the bellows fails --

15 MR. ASHAR: Except the temperature --

16 CHAIRMAN WALLIS: -- water runs down.

17 MEMBER SIEBER: Aren't there drains at the  
18 bottom of this thing pushing it, right?

19 MR. ASHAR: Some have. This one is not  
20 shown here. There is a drain right here.

21 CHAIRMAN WALLIS: There is a drain there?

22 MR. ASHAR: There is a drain.

23 MEMBER SIEBER: Okay.

24 CHAIRMAN WALLIS: So that is how you draw  
25 out the sand? You just let it soak out?

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1 MEMBER SIEBER: It drips into where the --

2 MR. ASHAR: The temperature in the drywell  
3 in general in that area is close to about 130-140  
4 degrees. So it helps a little bit drying --

5 CHAIRMAN WALLIS: It evaporates the water?

6 MR. ASHAR: To some extent, not -- I mean,  
7 I have been given those explanations by various  
8 applicants, I know, what does this, but I do not  
9 believe everything they say. But --

10 CHAIRMAN WALLIS: Okay.

11 MS. TRAN: Slide five, please.

12 MEMBER SIEBER: You say the space between  
13 the concrete and the shell and the drywell is filled  
14 with insulation.

15 MR. ASHAR: Yes, there is insulation in  
16 there.

17 MEMBER SIEBER: What is it, some kind of  
18 fiber of some sort?

19 MR. ASHAR: I think so, yes. In one case  
20 we found that insulation was bad enough that it has  
21 chloride and all those contaminants. So when the  
22 water came in, it came with contaminated water. And  
23 that started accelerating the corrosion rate.

24 MEMBER SIEBER: That would do it. The  
25 insulation holds the water all up and down.

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1 MR. ASHAR: Up and down.

2 MR. GILLESPIE: Hans, I think it is  
3 important here that we're not talking in every case  
4 about any single containment.

5 MR. ASHAR: Right.

6 MR. GILLESPIE: What you have hit on is  
7 exactly what I tried to say in the beginning. The  
8 specific designs are so variant that we have really  
9 found out in doing these reviews that a Mark I  
10 containment is not a Mark I containment when you're  
11 looking at the drain details and the drain location.  
12 It's a function of the age, the AE. And, for example,  
13 Nine Mile actually put cameras up to ten-inch drains  
14 that they have and looked up in there, and it was  
15 dust.

16 And so before we assume that this thing is  
17 always full of water on everyone, there is a great  
18 variance between each unit. The design is different.  
19 And what licensees have done in the past to verify  
20 either the presence or absence of water is very  
21 different.

22 And so it's not like there is a universal  
23 answer to each one of these. Each one really is  
24 different.

25 VICE CHAIRMAN SHACK: Now, again, just on

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1 that, are all of the ones filled with insulation or  
2 are some of them actually air gaps?

3 MEMBER ARMIJO: I thought Monticello was  
4 an air gap based on yesterday's presentation.

5 MR. ASHAR: It is called air gap. I mean,  
6 in general, the terminology used is air gap.

7 VICE CHAIRMAN SHACK: But, I mean, is it  
8 typically filled with insulation?

9 MR. ASHAR: Typically it is a concrete  
10 General Electric design. It has the insulation in  
11 most cases. There might be a plant or two that may  
12 not have it available, but there might be some plants.

13 MEMBER SIEBER: You almost need it to be  
14 the form for pouring the concrete.

15 MR. ASHAR: Right, exactly.

16 MEMBER SIEBER: You need something in  
17 there to do that. Otherwise you don't have a gap at  
18 all. And one of the ways you get water down there is  
19 you have to take that refueling seal out after you  
20 refuel in order to put the drywell back together. And  
21 the process of doing that leaves a lip of water --

22 MR. ASHAR: Right.

23 MEMBER SIEBER: -- all around where the  
24 seal --

25 MR. ASHAR: Right.

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1 MEMBER SIEBER: -- used to be. It can  
2 only go down.

3 CHAIRMAN WALLIS: Now, we had a plant  
4 recently which had bulges in this realignment.

5 MR. ASHAR: I want to clarify two things.  
6 Okay?

7 CHAIRMAN WALLIS: It was Brunswick.

8 MR. ASHAR: There is a problem with the  
9 terminology. The first thing, when we talk about the  
10 drywell shell, it is a freestanding drywell steel  
11 shell. And when we talk about the liner, it is  
12 attached to concrete with some kind of anchorages.

13 And that is where we use the word "liner."  
14 But I have seen people using very loosely "drywell  
15 liner" here. It is not true. Okay? We are going to  
16 clarify the terminology in the next -- there is no --

17 MEMBER SIEBER: The one plant that has the  
18 liner, the shell, the structural member is the  
19 concrete, the subject of the code.

20 CHAIRMAN WALLIS: Yes, that's right.

21 MEMBER SIEBER: So you can tolerate some  
22 amount of corrosion as long as you --

23 CHAIRMAN WALLIS: So the liner just sits  
24 on the --

25 MEMBER SIEBER: -- maintain tightness.

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1 CHAIRMAN WALLIS: Okay. So the liner sits  
2 on the concrete, which is why it bulges.

3 MEMBER SIEBER: Just in that one plant.

4 CHAIRMAN WALLIS: This one is  
5 freestanding, this one.

6 MEMBER SIEBER: Yes.

7 MR. ASHAR: The one we are showing is a  
8 freestanding shell plus the liner.

9 MS. TRAN: Okay. Slide five. For some  
10 applications, just the information provided was  
11 included in the various sections of the LRA. And for  
12 other applications, the information was obtained to  
13 request for additional information.

14 As a result, the proposed ISG recommended  
15 that future applicants provide a plant-specific aging  
16 management program that would address the loss of  
17 material for the accessible area of the drywell shell.

18 So the recommendations that the applicant  
19 should be included in there, in the aging management  
20 program to develop a corrosion rate that is really  
21 inferred from past UT examination or establish a  
22 corrosion rate using representative samples in similar  
23 operating condition.

24 CHAIRMAN WALLIS: I would think the  
25 corrosion rate was so low that it would be difficult

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1 to measure. Really, you could say that it's less than  
2 a certain amount.

3 MS. TRAN: Less than, then. No minimum  
4 design.

5 CHAIRMAN WALLIS: That's good enough. You  
6 don't actually want them to determine what it is  
7 because you might be so low that you can't measure it.  
8 But if it's less than a certain amount, that would be  
9 acceptable, wouldn't it?

10 MR. ASHAR: In general, subsection IWE of  
11 the ASME code allows close to about ten percent  
12 allowance --

13 CHAIRMAN WALLIS: I know, but --

14 MR. ASHAR: -- some localized corrosion.

15 CHAIRMAN WALLIS: But if there is no water  
16 there, the corrosion rate may be essentially zero.

17 MS. TRAN: Correct.

18 CHAIRMAN WALLIS: And so establishing a  
19 zero thing is very difficult to do.

20 MEMBER SIEBER: Really, what you are  
21 trying to do is to determine how close you are to  
22 min wall.

23 MR. ASHAR: The min wall, right, minimum  
24 wall.

25 MEMBER SIEBER: And by plotting the

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1 reduction in thickness, you can determine when you are  
2 going to hit min wall. At that point you no longer  
3 meet the code for that pressure vessel.

4 VICE CHAIRMAN SHACK: How do I do this?  
5 Do I have to have multiple UT readings from that  
6 inaccessible portion of the shell? Can I demonstrate  
7 that mine is always dry?

8 MEMBER MAYNARD: You could develop a way  
9 that you had data from the --

10 MR. ASHAR: Two in the same location.

11 MEMBER MAYNARD: If an applicant comes in  
12 and they don't have previous data, I'm not sure how  
13 they develop a rate.

14 MS. TRAN: This is what we learned in  
15 putting this together. They will have one point at  
16 the beginning, you know, the design of the fabrication  
17 point. And then as a result of generic letter 87-05,  
18 most applicants, I mean, yes, have another data point.  
19 So when using that, they could develop some kind of --

20 VICE CHAIRMAN SHACK: Again, that is very  
21 specific. How many data points did they take when  
22 they made those UT measurements? How many locations?

23 MS. TRAN: Eighty-seven? Do you know?

24 MR. ASHAR: Yes. Generally in response to  
25 87-05, a number of -- now I have to say licensees, not

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1 applicants -- licensees have taken that kind of  
2 approach that they will look at four points in four  
3 sectors --

4 VICE CHAIRMAN SHACK: Four quadrants.

5 MR. ASHAR: -- because they don't remove  
6 the sand. They just have the sand. It's not like  
7 Oyster Creek. So what they do is they chip out the  
8 concrete in certain areas and then take the  
9 measurements and in response to 87-05.

10 And the second reading they take is two  
11 years or so after. That gives them a closer rate at  
12 the same location. It isn't delicate science that,  
13 hey, something is going on. Then they do more work.

14 VICE CHAIRMAN SHACK: Now, again, from  
15 Monticello, they don't seem to have maintained those  
16 as access ports.

17 MEMBER SIEBER: No.

18 MR. ASHAR: No, they don't. I mean, they  
19 can get to it if they have to, but they don't maintain  
20 them because they --

21 MEMBER SIEBER: That becomes another  
22 pocket for corrosion --

23 MR. ASHAR: Yes, right. It becomes --

24 MEMBER SIEBER: -- because there is  
25 moisture inside the containment.

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1 MR. ASHAR: Right.

2 MEMBER SIEBER: In the sump is actually  
3 that floor there. The sump is built into the floor.  
4 And so every loose water, amount of water, ends up in  
5 that space where the drywell liner and the concrete  
6 meet.

7 So they have to fill it up. They have to  
8 do something. Otherwise you would have a pocket of  
9 water sitting there.

10 CHAIRMAN WALLIS: I am still a little  
11 puzzled. I would think that the corrosion rate is so  
12 low that it's within the uncertainty in the ultrasound  
13 measurements.

14 MR. ASHAR: If it is low, they will report  
15 as low.

16 MS. TRAN: At least we will have --

17 MEMBER SIEBER: Carbon steel water and --

18 CHAIRMAN WALLIS: There's no water there.

19 MR. GILLESPIE: As it happens with real  
20 applicants, we're looking at corrosion rates like 17,  
21 18 ml a year in some cases.

22 CHAIRMAN WALLIS: There is water there.

23 MR. GILLESPIE: Well, yes. And people are  
24 seeing some evidence of corrosion. In another case,  
25 Nine Mile case, they did these measurements. And then

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1 they have a high-corrosion area on mild carbon steel  
2 at the water line in the Torus.

3 And what they did was they took that rate  
4 as a conservative estimate, where they know water is,  
5 and applied it to their liner and say, "Okay. We've  
6 got 38 years to go here."

7 And so people actually have come up with  
8 ways given these points and other representative  
9 carbon steel areas within their area that they do  
10 measure because they're in harsher environments and  
11 applied that as a representation to this in order to  
12 show that they could make it past the renewal period  
13 or at least until the next measurement that they might  
14 commit to take.

15 And so so far each licensee that we have  
16 had an opportunity to both finish our review or  
17 interface with so far has actually been extremely  
18 consistent with this position. And so they have  
19 actually figured out how to do it.

20 And there is other carbon steel in the  
21 Torus, actually in a wet environment, which gives you  
22 a noticeable rate, as it happens, particularly where  
23 some of the liners have blistered and bubbled, which  
24 is a whole other issue, that they can apply to this.

25 It's a conservative application. You

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1 know, if it doesn't work, then they have to do  
2 something else to convince us that the rate is okay.

3 So when we talk the nebulous philosophy,  
4 it gets harder, but I think when you get to specific  
5 plant situations, pardon the pun, but it's concrete.  
6 And so they have kind of come up with ways to use the  
7 generic point, the generic letter issue points.

8 In fact, in Vermont Yankee's case, they  
9 actually had leakage and did extra measurements  
10 consistent with the ISP, which wasn't issued when they  
11 did this some years ago. And so they have preserved  
12 those extra points.

13 And so it just happens that these plants  
14 actually have this information sitting there. They  
15 just haven't used it in this application before. And  
16 this is clarifying. We expect you to use it in this  
17 application.

18 Go ahead, Linh.

19 MS. TRAN: I guess now where degradation  
20 has been identified in accessible area of the drywell,  
21 meaning in the interior area of the drywell, the  
22 applicant should provide an evaluation that would  
23 address the condition of the inaccessible area of a  
24 similar condition or find something in the interior  
25 area. They should have an evaluation for that.

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1 Now, to assure --

2 MEMBER APOSTOLAKIS: How does one do that?

3 MR. ASHAR: Let me. The actual, this is  
4 just what we have seen.

5 MEMBER APOSTOLAKIS: That's okay. You  
6 don't have to show it.

7 MR. ASHAR: Okay. This is the requirement  
8 we set in after when we endorsed IWE, IWL into  
9 50.55(a) in the rule, that if they find something in  
10 the accessible area, they ought to go and look in the  
11 surrounding inaccessible area to see if there is  
12 anything going on.

13 A lot of PWR licensees, for example, have  
14 found that at the junction of the steel liner of the  
15 concrete containment and the concrete floor, they have  
16 moisture barriers generally. And their moisture  
17 barrier gets damaged. The borated water many times go  
18 in. And it starts corroding the inside area. It  
19 shows up a little bit on the upper side.

20 So they would do examination and find out  
21 what is going on. And they find the moisture barrier  
22 could be the culprit. They have to change the  
23 culprit. They ought to go inside. They ought to take  
24 out the corrosion.

25 So that's the reason this problem has been

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1 in about the inaccessible. In accessible area you  
2 have corrosion. You would look into the joining  
3 inaccessible area to find every --

4 MEMBER APOSTOLAKIS: You will look into  
5 the inaccessible area. That helps make it accessible  
6 or not?

7 MR. ASHAR: No. If you see some rusting  
8 or something on the --

9 MEMBER APOSTOLAKIS: You can look at it.  
10 Why isn't it accessible?

11 MR. ASHAR: No, no. The whole area is  
12 that you see something in an accessible area. And  
13 they investigate as to what is going on underneath  
14 that particular area. The basic focus in the room was  
15 the PWR containments. That is where it was found in  
16 so many of them. And still we are finding it.

17 MEMBER ARMIJO: But it is possible you  
18 could have damage occurring in an inaccessible area  
19 and have nothing in the accessible.

20 MR. ASHAR: That's quite right.

21 MEMBER SIEBER: Possible.

22 MR. ASHAR: That is why this type of --

23 MEMBER ARMIJO: Very possible. I mean,  
24 it's --

25 MS. TRAN: That is why we use accessible

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1 area as the indication for the accessible area for the  
2 augmented inspection. They have to do visual in the  
3 surface. And then if the surface area is accessible  
4 only from one side and they have to protect the wall  
5 thing by using ultrasonic --

6 MEMBER ARMIJO: I don't worry about the  
7 accessible. I just worry about the inaccessible and  
8 having no way of knowing just by looking at the  
9 accessible area. It's not a good --

10 MR. ASHAR: That is where this ISG kicks  
11 in because this ISG is focused on inaccessible area.  
12 This is one of the pointers, that if there is  
13 something going on in the accessible area, which you  
14 can see right away, then there is something going on  
15 and you will look at it.

16 MEMBER ARMIJO: That is the easy part.

17 MR. ASHAR: The ISG concentration, focus  
18 of this ISG, is the inaccessible areas.

19 MEMBER APOSTOLAKIS: But how does one  
20 suspect?

21 CHAIRMAN WALLIS: Yes, that's right. How  
22 does one suspect?

23 MEMBER APOSTOLAKIS: How do you suspect?

24 MS. TRAN: You find water or leakage on  
25 your --

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1 MEMBER APOSTOLAKIS: That is getting back  
2 to what Dr. Armijo is saying. That's not our worry.  
3 What if you don't find water? You still make some  
4 problem in the inaccessible area. Is that correct?

5 MEMBER ARMIJO: Yes, you could.

6 MEMBER APOSTOLAKIS: So how does one  
7 suspect that something is going on in the inaccessible  
8 area?

9 MEMBER BONACA: No. She says water.

10 MS. TRAN: Water is one. If you find  
11 water in the drain lines, water in the drain line, in  
12 the --

13 MEMBER BONACA: For example, if the seals  
14 -- I guess you are focusing on the seals and on the  
15 bellows, right?

16 MR. ASHAR: Right.

17 MEMBER SIEBER: The only way you can get  
18 water into the inaccessible area is to have it flow  
19 through the accessible area. So if you make a  
20 measurement in the accessible area --

21 MEMBER APOSTOLAKIS: Okay. That is a  
22 different --

23 MEMBER SIEBER: -- that gives you some  
24 kind of justification to extrapolate to the area you  
25 get.

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1 MEMBER APOSTOLAKIS: But that doesn't help  
2 much because it could have run down --

3 VICE CHAIRMAN SHACK: The water runs down  
4 and collects at the --

5 MEMBER SIEBER: Right.

6 VICE CHAIRMAN SHACK: It doesn't stay on  
7 the side of the --

8 MEMBER BONACA: That is why the real focus  
9 is the last bullet. And that's what they attempted to  
10 do, you know, to put in the seals and the bellows in  
11 the scope of license renewal. And this has been kind  
12 of debated with the industry.

13 CHAIRMAN WALLIS: This is a very weak  
14 statement, "if moisture is suspected." That's a very  
15 subjective --

16 MS. TRAN: Or detected.

17 CHAIRMAN WALLIS: If you have a suspicious  
18 nature, you would suspect it all the time.

19 MR. ASHAR: Subsection IWE in its  
20 IWE-1240, there's a number of items. This is the  
21 abbreviated form. A number of places where this could  
22 occur is very vividly described in there, IWE-1240 in  
23 the ASME code. And that is what we are invoking, but  
24 we did not write everything that is written in the  
25 IWE-1240.

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1 MEMBER APOSTOLAKIS: Now, you are really  
2 including SSCs that are identified as source of  
3 moisture and scope, source of moisture?

4 MR. ASHAR: Yes. For example, cracking of  
5 bellows.

6 MEMBER SIEBER: The refueling seal.

7 MR. ASHAR: I explained to you earlier.

8 MEMBER APOSTOLAKIS: Okay. That's what --

9 MS. TRAN: The refueling seal is not.

10 MR. ASHAR: Refueling seal.

11 MS. TRAN: So they have to put that in the  
12 scope of license renewal.

13 MR. ASHAR: This is what we are --

14 MEMBER APOSTOLAKIS: Okay.

15 CHAIRMAN WALLIS: Why don't they just  
16 require that they check the bellows for cracks  
17 routinely?

18 MR. ASHAR: It is not very easy to get to  
19 it. They can do tests. That's what they do most --

20 MEMBER SIEBER: It not the only place it  
21 can leak.

22 MR. ASHAR: Yes. And I say --

23 MEMBER SIEBER: They can leak along the  
24 edge.

25 MR. ASHAR: Yes. And this is what we want

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1 to have them in the scope of license renewal, so they  
2 maintain them in a condition where it is not leaking.

3 MEMBER MAYNARD: Well, by "suspected"  
4 here, don't you really mean if there has been some  
5 previous evidence that moisture has been there? You  
6 know, I suspect. I have a hard time dealing with what  
7 I might suspect, but I can deal with whether I have  
8 had any indications or evidence.

9 MS. TRAN: Yes. This is "suspect" or  
10 "detected" through your drain lines.

11 CHAIRMAN WALLIS: Well, if moisture is  
12 detected, now, that makes sense.

13 MEMBER MAYNARD: Yes.

14 MS. TRAN: It should be "detected,"  
15 instead of "suspected."

16 VICE CHAIRMAN SHACK: So if moisture has  
17 been detected any time in the life of this plant up  
18 until license renewal included? Is that what it says?

19 MEMBER APOSTOLAKIS: It is not really  
20 detected. Go ahead. You answered my question.

21 CHAIRMAN WALLIS: Well, just take out the  
22 "if" clause and say, "include."

23 VICE CHAIRMAN SHACK: Yes. Why not just  
24 include them?

25 MEMBER APOSTOLAKIS: I think "suspected"

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1 is broader because would that include a situation  
2 where you have seen moisture or water in a similar  
3 facility and you suspect it may happen in yours, even  
4 though you hadn't seen it? "Suspected" is broader.

5 MEMBER MAYNARD: Well, yes, but I think  
6 from a regulatory standpoint and from dealing with  
7 licensees, I think you need a little bit better  
8 definition rather than it just being somebody's  
9 opinion sitting there saying, "Well, I suspect there  
10 might be something there."

11 CHAIRMAN WALLIS: Suspected by whom?  
12 Inspector or is it --

13 MEMBER MAYNARD: Well, I like the  
14 "detected" or --

15 MS. TRAN: Detected. I think --

16 MEMBER BONACA: We had a discussion  
17 yesterday at Monticello that shows how difficult the  
18 issue is. I mean, we rely very much on subjective  
19 judgments and say, "Well, we don't think we ever had  
20 water."

21 CHAIRMAN WALLIS: You could simply say  
22 that "The ACRS suspects that there may always be water  
23 there. Therefore."

24 MEMBER APOSTOLAKIS: You guys must have  
25 had a hell of a meeting yesterday.

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1 VICE CHAIRMAN SHACK: In Monticello's  
2 case, they see no evidence of corrosion in '87, which  
3 was a fairly substantial operating period for them.

4 MEMBER APOSTOLAKIS: That's right.

5 MS. TRAN: Identified.

6 MEMBER ARMIJO: If they have good records,  
7 they have a good sound --

8 VICE CHAIRMAN SHACK: One data point.

9 MR. ASHAR: We have to draw things --

10 MEMBER ARMIJO: They don't have to do it.

11 MS. TRAN: So just to get back on --

12 CHAIRMAN WALLIS: You really fixed this  
13 up.

14 VICE CHAIRMAN SHACK: Why not just put  
15 these seals in scope and be done with it?

16 MR. ASHAR: This is what we tried to do  
17 earlier. And there is so much resistance from a  
18 number of applicants. I mean, I had to go to three or  
19 four RAIs over and above a lot of teleconferences to  
20 convince them to put this in the scope of license  
21 renewal. And so many people denied.

22 CHAIRMAN WALLIS: So now you have to  
23 convince them to suspect something?

24 MR. ASHAR: No. Now, with this ISG, if  
25 they have suspected sites, areas, then --

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1 CHAIRMAN WALLIS: But they don't want to  
2 do it anyway. They'll never suspect anything.

3 MEMBER APOSTOLAKIS: No. Presumably there  
4 will be some guidance what suspicion means.

5 MR. ASHAR: There is a guidance.

6 MEMBER APOSTOLAKIS: Yes.

7 MR. ASHAR: There is.

8 CHAIRMAN WALLIS: There must be.

9 MEMBER APOSTOLAKIS: It just doesn't say  
10 it in bullets.

11 MS. TRAN: Yes.

12 MR. ASHAR: I was looking for IWE-1240  
13 here. I don't have one.

14 CHAIRMAN WALLIS: Okay.

15 MR. ASHAR: But that is where it is fully  
16 described as to -- this is what we are invoking here  
17 basically.

18 CHAIRMAN WALLIS: You want to say  
19 something, "if there are indications of moisture" or  
20 something like that.

21 MR. KUO: If I may, Part 54 rule in the  
22 rule language in the SOC discussed this, saying if a  
23 component is in an environment that could have aging  
24 effect, say in the operating experience, anywhere in  
25 the industry or your specific plant, that there is

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1 such a degradation mechanism, degradation mechanism  
2 that could cause an aging effect, then an aging  
3 management program should be provided. That's what  
4 the Part 54 rule requires.

5 In other words, if this is a possible  
6 aging effect from the operating experience, then that  
7 is suspected. You would use the word "suspect." That  
8 happened before. We should not talk about the  
9 hypothetical aging effect, but it is an aging effect  
10 that we have seen before.

11 VICE CHAIRMAN SHACK: Right. That is why  
12 I can't understand why you can't just put the seals in  
13 scope. I mean, it's not a hypothetical event.

14 MR. KUO: Like Hans said, some people  
15 don't want to include the seal in the scope.

16 CHAIRMAN WALLIS: There are often people  
17 who don't want to do things, but you can say, "Do it."

18 MEMBER BONACA: What you want and what you  
19 get are two different things.

20 MR. GILLESPIE: I think you will find as  
21 a result of this ISG, fundamentally seals are in  
22 scope. Remember, seals and the refueling stuff are  
23 not safety basically. And so what we're doing is  
24 because of the effect of non-safety components on a  
25 safety component, we're bringing them into scope. So

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1 it's a bit indirect.

2 And so it shouldn't be a surprise that  
3 utilities don't want extra requirement on things that  
4 don't have any requirements on them now.

5 MEMBER BONACA: But, you know, one thing  
6 that we are learning from this license renewal process  
7 as we converge, it seems to me that the central issues  
8 are becoming the inaccessible or buried components  
9 that you can't look at, that you cannot measure. And  
10 that's natural because, I mean, these plants are going  
11 beyond some original design in certain components of  
12 the -- and I think that it is important that we focus  
13 on these inaccessible components and ask our  
14 questions, you know, how long can this live and what  
15 is the source of the problem. And here -- anyway --

16 MS. TRAN: Hans wanted me to read the  
17 IWE-1241, the examination surfaces, "Surface area for  
18 the typical location," "Typical location of such areas  
19 of those exposed to stand-in water, repeated wetting  
20 and drying, persistent leakage, and those with  
21 geometries that permit water accumulations,  
22 condensation, and biologicals attack." I mean, it is  
23 in the -- it tells the applicant the area.

24 Now, let's say if moisture is detected as  
25 suspected or identified --

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1 (Laughter.)

2 MS. TRAN: Now, we will agree that they  
3 found water. Okay? So they should include the  
4 component, the source of it, in the scope of license  
5 renewal. In addition, we need to identify the surface  
6 area.

7 Next slide. By implementing and  
8 augmenting inspection for the period of extended  
9 operation in accordance with the ASME section 11,  
10 subsection IWE and also for the examination shall be  
11 in accordance with section 11, subsection IWE-2500.  
12 And I did go over that a little bit earlier.

13 That means that surface area accessible  
14 from both sides should be visually examined and  
15 surface area that is only accessible from one side  
16 should be examined for wall thinning and using sonic  
17 thickness measurement method.

18 Now, after all of that, after all of the  
19 augmented inspection, the applicant should demonstrate  
20 that either corrosion is not occurring by performing  
21 those examinations or analysis to do analysis on the  
22 result or that corrosion is progressing so slowly that  
23 the age-related degradation will not jeopardize the  
24 intended function of the drywell to the period of  
25 extended operation.

1 VICE CHAIRMAN SHACK: Just how thick is  
2 this light bulb again?

3 MR. ASHAR: The light bulb? It varies.  
4 From the top, it is thinner, very thin, right around  
5 half-inch to three-quarter-inch. As you go down near  
6 the knuckle area between the sphere and the upper  
7 part, it is spherical area. It is close to about .7,  
8 .6 inches. Then it again goes down up to six inches.  
9 And then at the bottom area is about one to one and a  
10 half inches in between the sand pocket area --

11 VICE CHAIRMAN SHACK: No. But, I mean,  
12 it's 17 ml a year.

13 MR. ASHAR: Oh, yes.

14 VICE CHAIRMAN SHACK: You're going to chew  
15 that at a pretty good clip.

16 MEMBER BONACA: If you find a hole in the  
17 liner, I mean, would you suspect some moisture there?  
18 I mean, what is --

19 CHAIRMAN WALLIS: Even my chassis of my  
20 car, which is soaked in salt, doesn't corrode at 17 ml  
21 per year, does it? It's really bad conditions if  
22 you've got --

23 MR. GILLESPIE: Yes. That actually is the  
24 two worst points that a particular --

25 CHAIRMAN WALLIS: Yes, very bad --

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1 MR. GILLESPIE: -- that they reported to  
2 us. What it does do, though, is say there is  
3 operating history out there in this utility  
4 environment, that we cannot take for granted that it  
5 can't happen.

6 CHAIRMAN WALLIS: Right.

7 MR. GILLESPIE: And that's the reason for  
8 the ISG. We are not going to make the assumption  
9 because we have operating history that says it's not  
10 necessarily a valid assumption in all cases that it's  
11 going to go slow. There has been evidence of this  
12 going faster than people would have originally  
13 anticipated in the designs.

14 MEMBER BONACA: But in some cases where we  
15 have questioned the bellows, particularly the seals,  
16 if you're in seals, then the answer is always, well,  
17 we have good drainage. So you are in a quandary. I  
18 mean, what leads you --

19 MR. ASHAR: There are a number of things  
20 that tells us. The first thing, the drains are not  
21 clogged any time in the past. The second thing,  
22 visual examinations performed in the areas, it was  
23 shown there are no telltale signs of water for a  
24 number of inspections there performed. Then they had  
25 to show us at the bottom in the drain line there was

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1 no water coming out anywhere.

2 So there are so many things that they  
3 would tell us before they convince us that there is  
4 nothing going on.

5 MR. GILLESPIE: Mario, I would also say  
6 that I think this came up in Monticello's case  
7 yesterday, --

8 MR. ASHAR: Right.

9 MR. GILLESPIE: -- where they didn't take  
10 credit for it, but they actually had a primer sprayed  
11 on the outside of the inaccessible area. And other  
12 licensees have different applications of codings on it  
13 also.

14 And so it's not one thing.

15 MEMBER BONACA: Yes, I know, but --

16 MR. GILLESPIE: Aging management is  
17 accumulation of codings, time of exposure, amount of  
18 water.

19 MEMBER BONACA: And the spray on the  
20 surface was 65 or 40 years ago practically, 1965. So,  
21 you know, right. I understand.

22 MR. GILLESPIE: But the environment is not  
23 such that there is anything in there to actually cause  
24 the paint to peel off either. So there's no one issue  
25 here.

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1 MEMBER BONACA: Yes. I understand.

2 MR. GILLESPIE: It's different pieces to  
3 try to give you reasonable assurance.

4 MEMBER BONACA: In fact, yesterday at the  
5 end of the conversation, it was the lady who was  
6 performing the inspections felt confident with that.  
7 I'm sure that if you go physically and look at it and  
8 get information, you know, you can build a credible  
9 case that there is no concern with moisture. So I  
10 accepted that yesterday.

11 MEMBER ARMIJO: But a case has to be made  
12 --

13 MEMBER BONACA: Yes, it does.

14 MEMBER ARMIJO: -- with documented data,  
15 not just --

16 MEMBER BONACA: Right.

17 MEMBER MAYNARD: Is there something that  
18 is done periodically to ensure that these drains are  
19 really open, like particularly the sand point drains  
20 and stuff, that they're not plugged in some way?

21 MR. ASHAR: Now they are committing to  
22 those things. They have ensured those things, yes.

23 VICE CHAIRMAN SHACK: You'll find out when  
24 you have a leak.

25 MEMBER SIEBER: A sand pocket drain is a

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1 four-inch pipe. So they're hard to plug.

2 VICE CHAIRMAN SHACK: Yes.

3 MEMBER BONACA: I believe we have also  
4 some comments from the industry.

5 MS. TRAN: Right. Yes.

6 MEMBER BONACA: So shortly we'll get to  
7 those.

8 MS. TRAN: I am almost done. Now, if the  
9 intended function of the drywell cannot be met, the  
10 applicant can identify actions that will be taken as  
11 part of the aging management program to ensure that  
12 the integrity of the drywell would be maintained  
13 through the period of extended operation.

14 Last slide. Now, the drywell shell  
15 concern has already been addressed for the reactor's  
16 initial 40 years' licenses and relevant plants that  
17 have received a renewal license, as indicated in the  
18 left column there.

19 Now, the staff is in the process of  
20 reviewing the plants in the middle column. And the  
21 third column represented the remainder of the plants  
22 with the Mark I steel containment design.

23 Not all the plants in the third column,  
24 however, have announced their intention to renew their  
25 license, but the future review that's listed on the

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1 right side.

2 This concludes my presentation. So we can  
3 entertain any additional questions that you might  
4 have.

5 MEMBER BONACA: You don't have to request  
6 questions.

7 CHAIRMAN WALLIS: Ell, I suspect there  
8 might be some more questions.

9 (Laughter.)

10 MEMBER SIEBER: I don't know what they  
11 would be that we haven't already asked.

12 MEMBER BONACA: Any additional questions?

13 (No response.)

14 MEMBER BONACA: None. So we thank you for  
15 a very good presentation.

16 MS. TRAN: Thank you.

17 CHAIRMAN WALLIS: You have been here all  
18 day, Alex.

19 MR. MARRION: I know. Can I get one of  
20 those little name tag things? I'll just put it on.

21 (Laughter.)

22 MR. MARRION: Good afternoon. My name is  
23 Alex Marrion. I'm Senior Director of Engineering with  
24 NEI. And with me I have James Ross, who is the senior  
25 project manager with lead responsibility for license

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1 renewal. He's here to keep me out of trouble. He  
2 should have been here earlier.

3 I just want to make a couple of general  
4 comments. Based upon comments that the NRC made about  
5 the uniqueness of the specific plant designs, we feel  
6 that this is not really a generic issue, but it's  
7 appropriate to address it on a plant-specific basis in  
8 accordance with the uniqueness of the designs. And I  
9 think Frank Gillespie brought that up.

10 This is not a new issue. It's been  
11 addressed by the licensees in the past. There was a  
12 generic letter, 8705. And inspection requirements  
13 were incorporated into NRC regulations when NRC  
14 endorsed the ASME code subsection IWE as part of an  
15 update of 10 CFR 50.55(a).

16 Because that was already regulatory  
17 requirements, utilities were resisting the idea of  
18 imposing an additional regulatory requirement given  
19 that there wasn't sufficient evidence to indicate that  
20 the current requirement was not adequate if that makes  
21 sense.

22 The particular interim staff guidance is  
23 out for comment. Right now comments are due the 8th  
24 of June. We intend to submit comments on behalf of  
25 the industry.

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1           Most of the comments will be of a  
2 clarifying nature to make sure we understand the  
3 language, et cetera, which brings me to a more generic  
4 communication process issue. You know how I feel  
5 about generic communications based upon comments I  
6 made earlier.

7           The one thing that is not clear to us as  
8 an industry is why there is a need for an ISG process  
9 to begin with given that the NRC already has a  
10 well-established generic communication process that  
11 could be used as a vehicle for communicating staff  
12 guidance going forward.

13           So now we have generic communications.  
14 And we also have interim staff guidance, two separate  
15 processes that basically overlap. So we're going to  
16 continue making that point with every opportunity we  
17 have.

18           Lastly, I understand some question has  
19 been raised about the idea of continuing or the idea  
20 of imposing ultrasonic testing requirements. I want  
21 to make it clear that the current requirements that we  
22 currently have are for a graded approach to a visual  
23 examination.

24           And depending upon what you find, you do  
25 a more comprehensive examination, but the first step

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1 is a visual. And that's basic --

2 CHAIRMAN WALLIS: How do you visually  
3 inspect these inaccessible areas?

4 MR. MARRION: Well, as you heard from the  
5 staff, you do an examination of the inaccessible areas  
6 based upon what you find of the accessible areas if I  
7 have characterized it properly in what the staff was  
8 proposing.

9 And for the Mark I's, we intend to  
10 continue that process going forward. And we will be  
11 commenting accordingly on the ISG comments.

12 CHAIRMAN WALLIS: You have to be able to  
13 access some place which is relatively typical of the  
14 inaccessible places in order to do that.

15 MR. MARRION: Yes. I'm not familiar with  
16 the details of what that is, yes.

17 That's all I have, sir.

18 MEMBER ARMIJO: I just think that is  
19 fundamentally unsound because you have, really, a  
20 crevice condition in that sand pocket area. It's not  
21 at all represented by the accessible area.

22 And so looking at a safe location to make  
23 a judgment of a susceptible location seems to me a  
24 waste of time. I mean, if the accessible area is  
25 highly corroded, you can be sure that the inaccessible

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1 is in bad shape.

2 MR. MARRION: Right.

3 MEMBER ARMIJO: But the converse isn't  
4 true.

5 MEMBER APOSTOLAKIS: But didn't Jack say  
6 that for the water to get to the inaccessible area, it  
7 has to go through the accessible areas?

8 MEMBER ARMIJO: Yes, but it doesn't stay  
9 there.

10 VICE CHAIRMAN SHACK: It doesn't stay  
11 there.

12 MEMBER ARMIJO: It flows.

13 VICE CHAIRMAN SHACK: You have got a drain  
14 right at that thing. I mean, there is no way for  
15 water to really accumulate --

16 MEMBER APOSTOLAKIS: It is not  
17 accumulating.

18 VICE CHAIRMAN SHACK: -- in that  
19 accessible area.

20 CHAIRMAN WALLIS: But it gets to the sound  
21 --

22 MEMBER APOSTOLAKIS: But you are going to  
23 see some moisture or something.

24 MEMBER ARMIJO: You can make a case that  
25 if it's always been dry, that's your best case. You

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1 have good data.

2 MEMBER MAYNARD: I thought part of that,  
3 it would depend on what you include as a visual area  
4 for what you base -- if you're including the drains  
5 and if there is any moisture coming out of the sand  
6 drains or anything like that, well, that might be  
7 appropriate. But if you're saying that all you have  
8 to do is just visually look at the inside of the  
9 container there, that you don't have to do anything  
10 else.

11 But if you include as part of what you  
12 find visually results of drains and other things --

13 MR. MARRION: That is a comprehensive  
14 examination requirement that's in 50.55(a) right now.

15 Thank you. And I appreciate the time I  
16 spent with this illustrious body today.

17 (Laughter.)

18 MEMBER KRESS: We are honored to have you.

19 MEMBER BONACA: If there are no further  
20 questions, first of all, I want to thank the staff for  
21 their presentations and for the information. And then  
22 I'll turn the meeting back to you, Chairman.

23 CHAIRMAN WALLIS: Thank you very much.

24 We are finished with our formal  
25 presentations for the day.

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1 MEMBER KRESS: We don't have a letter on  
2 this particular issue?

3 MEMBER BONACA: No.

4 MEMBER KRESS: This was just a briefing?

5 CHAIRMAN WALLIS: Just a briefing. It was  
6 just a briefing.

7 MEMBER BONACA: There is no impact  
8 because, I mean, it was helpful because, again,  
9 yesterday we had a --

10 CHAIRMAN WALLIS: We don't need that --

11 MEMBER KRESS: Are we going to give some  
12 feedback now or anything on what we've heard or do you  
13 think the questions are sufficient?

14 VICE CHAIRMAN SHACK: The questions were  
15 sufficient.

16 CHAIRMAN WALLIS: Unless you have another  
17 point you want to make. Do you want to make some  
18 point?

19 MEMBER KRESS: Well, my point was that I  
20 just don't like this round-about way of doing things  
21 in the sense that I think there's a fatal flaw in  
22 trying to use the accessible areas to determine  
23 whether or not there is a problem in the inaccessible  
24 areas.

25 I would do what Bill Shack just said. Why

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1 not just include those sources of moisture within the  
2 scope?

3 VICE CHAIRMAN SHACK: Well, I think --

4 MEMBER KRESS: I know it has been resisted  
5 by the industry, but it doesn't seem like that big of  
6 a burden to me. I think that's the real solution.  
7 And that's what they're after, but they're trying to  
8 do it in a round-about way.

9 VICE CHAIRMAN SHACK: I also think a  
10 techie could come up with a way to measure those  
11 thicknesses.

12 MEMBER KRESS: Show me that way, and that  
13 may be okay. That's possible.

14 MEMBER SIEBER: Well, when you put the  
15 refueling seal in the scope, all you're doing is  
16 establishing an aging management program for that.  
17 That doesn't prevent leakage necessarily because there  
18 may be something other than the aging that causes the  
19 leaking.

20 MEMBER KRESS: Okay. Maybe. Maybe I am  
21 flawed.

22 MEMBER SIEBER: You could twist it, and  
23 now it leaks.

24 CHAIRMAN WALLIS: You should probably  
25 inspect a more susceptible area, which is a sand

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1 pocket.

2 MEMBER SIEBER: I think you have to deal  
3 with the --

4 MEMBER BONACA: In the past we left it to  
5 the --

6 MEMBER SIEBER: -- rather than deal with  
7 something that is removed from it.

8 MEMBER BONACA: In the past we left it to  
9 a licensee to have a choice. For example, in Browns  
10 Ferry, the staff was asking for inspection of the  
11 seals. They fought that. We left them open, either  
12 that or UT the liner in the vulnerable locations. And  
13 they chose to UT the liners.

14 The burden is inaccessibility because  
15 there is going to be that every ten years. And when  
16 they do the ISR, they are in containment. And they  
17 physically can then perform most of the utilities in  
18 those locations. So we left open those possibilities.

19 I take your point, and I think the  
20 Committee should decide. Should we have a comment on  
21 this or -- the intent wasn't one of providing a  
22 letter. This was an informational presentation, but  
23 --

24 CHAIRMAN WALLIS: I think the staff has  
25 heard our comments. It was a preliminary sort of

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1 thing. And that is probably good enough for now.

2 MR. GILLESPIE: We appreciate the comments  
3 because, as Mario said, underground cabling, piping,  
4 and this kind of large passive component are really  
5 becoming kind of the end point. Everything else we  
6 know how to deal with for the most part.

7 But I will say in this case -- and let me  
8 take Browns Ferry. You might say, well, why did  
9 Browns Ferry choose UT versus the seals. Browns Ferry  
10 actually had unidentified sources of leakage. And he  
11 said versus trying to identify every source of leakage  
12 because they didn't know where it was that their  
13 cheapest way out was actually to do the UT.

14 But they got the idea that we wanted to  
15 wait. And you had to assure us this thing was going  
16 to be okay relative to thickness.

17 VICE CHAIRMAN SHACK: That sand pocket is  
18 pretty big. I mean, you can have a fair amount of  
19 moisture in there that you're never going to see  
20 coming out of those drains. And, yet, you could have  
21 attack over a reasonable fraction of that.

22 MEMBER SIEBER: There are oodles of  
23 surface in there for the moisture to collect on.

24 MR. GILLESPIE: But, again, the locations  
25 of the drains are plant-specific. Some plants have

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1 seals, as Monticello had over it. Some places have a  
2 liner or coding on the other side of the surface.

3 VICE CHAIRMAN SHACK: Well, a bottom drain  
4 would give me a whole lot more comfort than that top  
5 drain would.

6 MR. GILLESPIE: Yes. The other thing is  
7 the sand is very compacted.

8 MEMBER KRESS: Have you ever tried to  
9 drain moisture out of the sand from the bottom? It  
10 doesn't come out.

11 MR. GILLESPIE: I don't want to pooh-pooh  
12 it, but the idea that this is a 130-degree area also  
13 --

14 VICE CHAIRMAN SHACK: You drive it out  
15 with --

16 MR. GILLESPIE: And so you're going to  
17 drive it out. And so you've actually got the occasion  
18 to get water in there about 20 days every 18 months or  
19 24 months depending on the fuel cycle someone is on  
20 and how long it's flooded. And that's why we've  
21 started to key into visual. You might say, visual  
22 leakage from someplace kicks you into needing to do a  
23 UT.

24 Now, what this inter-staff guidance  
25 position does do is says the identification of

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1 moisture, basically leakage, is equivalent to the  
2 visual recognition of accelerated corrosion on the  
3 inside. And that's an important distinction, which  
4 never existed before.

5 So for the inaccessible areas, we're using  
6 the indirect indication of seeing water as kind of an  
7 assumption that you have to do the same thing as if  
8 you saw accelerated corrosion on the inside. That  
9 gets us a measurement on an event basis.

10 And so someone who is sworn to keeping  
11 this thing dry, if they have an event during a  
12 refueling where they get leakage in there, now they're  
13 obligated to do something which is a bit more onerous  
14 and reestablish their rate.

15 It's not perfect. By the way, there are  
16 two inaccessible areas. We should be clear on that.  
17 There is the inaccessible area in the air gap. And  
18 then there's this inaccessible area that's layered on  
19 the bottom between the two concrete layers, which is  
20 really probably the most difficult area, but it was  
21 designed to last 40 years. It is totally lined with  
22 concrete. And then you've got this temperature  
23 gradient.

24 CHAIRMAN WALLIS: Is 40 years good enough  
25 with license renewal, though?

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1 MR. GILLESPIE: Now, it was originally  
2 designed for 40 years, but that was kind of an  
3 assignment. But now if you have no evidence of in  
4 leakage or water in there, I mean, again, it's  
5 indirect stuff. It's almost like a circumstantial  
6 case we're acting --

7 CHAIRMAN WALLIS: Concrete is not dry all  
8 the time.

9 MR. GILLESPIE: Concrete is porous  
10 material, and it is not dry all the time. And so then  
11 you could ask questions. A fair question in the aging  
12 management program is, what are you doing about  
13 groundwater? And do we have any evidence of  
14 groundwater?

15 We asked that from Nine Mile. And I think  
16 we're coming. I signed up the draft SE this morning.  
17 So I think next month we're probably coming on Nine  
18 Mile. They have actually got alarms on their drains  
19 if moisture is detected.

20 So every plant is doing some unique  
21 things.

22 CHAIRMAN WALLIS: Moisture can come out of  
23 the concrete. There is a lot of concrete. There is  
24 a late curing of the concrete which goes on for a long  
25 time. Then it can be damp. It doesn't have to be

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1 very damp --

2 MR. GILLESPIE: Right.

3 CHAIRMAN WALLIS: -- to produce some  
4 chemical reaction.

5 MR. GILLESPIE: What is the impact? This  
6 is what I don't know, is what is the impact of this  
7 temperature gradient.

8 CHAIRMAN WALLIS: You don't have oxygen.  
9 So that is probably what protects you.

10 MR. GILLESPIE: And so there is a number  
11 of things that -- we're doing our best, appreciate the  
12 Committee's comments, and more than happy. If anyone  
13 else has any better ideas, we would love to have them,  
14 but this ISG was an effort to send a benchmark for  
15 basically the best-performing plant on liners.

16 It has no moisture. What if you get  
17 moisture? How do you establish your rate? This is  
18 kind of putting out, in essence, that they now know we  
19 do expect a rate to even be established. We didn't  
20 have that in writing before.

21 CHAIRMAN WALLIS: We won't comment on it,  
22 and we hope it works out.

23 MR. GILLESPIE: Well, feel free to comment  
24 on it. We're happy to have comments. NEI is going to  
25 feel free to comment on it.

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1 CHAIRMAN WALLIS: We won't.

2 MEMBER BONACA: Certainly we will comment  
3 on individual applications.

4 MR. GILLESPIE: Yes. I do think this is  
5 middle ground we are wrestling with here because I do  
6 agree with Alex that the individual designs that we're  
7 applying this concept to are significantly different.  
8 In critical questions, like locations of drains, some  
9 are going to be more susceptible than others.

10 As I said, Browns Ferry said we have  
11 unidentified leakage. We know we have leakage. It's  
12 not a lot. UT is our answer. It's the only way that  
13 could give us positive confirmation.

14 CHAIRMAN WALLIS: Have they been having  
15 leakage on their reactor which has been shut down for  
16 all that period of time, unidentified leakage?

17 MR. GILLESPIE: Well, remember, we license  
18 units I, II, and III. The floor wasn't flooded on 1.  
19 So they haven't had any leakage on I for a long time.

20 CHAIRMAN WALLIS: They think they haven't.  
21 They could have an unidentified leakage.

22 MR. GILLESPIE: They had some unidentified  
23 leakage from refuelings in the other units, and they  
24 chose UT.

25 MEMBER SIEBER: They have them for fuel

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1 for --

2 MR. GILLESPIE: By the way, this is a very  
3 high-dose area, too. And so the question here isn't  
4 money.

5 MEMBER BONACA: Not only they. I mean --

6 MR. GILLESPIE: It's going to be dose.

7 MEMBER BONACA: Where the seals are, it's  
8 a very high red area.

9 MR. GILLESPIE: Yes.

10 MEMBER BONACA: Not down in the sand  
11 pocket.

12 MR. GILLESPIE: It depends on where you're  
13 at. You're directly under the vessel.

14 CHAIRMAN WALLIS: No one is going to go  
15 down there.

16 MR. GILLESPIE: My understanding from the  
17 licensees is from a radiological perspective, this is  
18 not an area you want to take lightly doing extra  
19 measurements over and above what you really need to  
20 confirm your --

21 CHAIRMAN WALLIS: BSBWR has hatches that  
22 you go in into the reactor pedestal area.

23 MEMBER BONACA: We were told by TVA that  
24 it is not a high red area because it is well below the  
25 --

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1                   MEMBER KRESS:  Graham, I was wondering if  
2                   the staff is considering a user need letter to  
3                   Research to try to develop a way to do this more  
4                   definitively, maybe strong on ultrasonics or  
5                   something.  Is there such a user need letter or any --

6                   VICE CHAIRMAN SHACK:  Well, there is  
7                   something from Oak Ridge now.

8                   MR. GILLESPIE:  Actually, there is a  
9                   letter report that just recently got put in ADAM from  
10                  Oak Ridge, from a project that Research sponsored, but  
11                  it is not commercially available yet.  And, as best I  
12                  understand it, it is a technique to calibrate for this  
13                  concrete steel concrete sandwich.

14                  I think, as I understand it, there are  
15                  three different alternative approaches to doing it.  
16                  And so the information is starting to be developed and  
17                  published.  But we're probably years away from actual  
18                  commercial application to go from the research bench  
19                  to the --

20                  MEMBER KRESS:  Yes, but you have got years  
21                  to go to do it in.  I mean, the corrosion rate is low  
22                  enough that --

23                  MR. GILLESPIE:  I am not disagreeing.  If  
24                  the Committee would like to -- we think we're actually  
25                  pretty close right now on a plant-by-plant basis.  But

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1 if the Committee would like to write a letter  
2 recommending a research project, it's okay. I don't  
3 mind. It's your Committee.

4 MEMBER SIEBER: The question is what do  
5 you want to cut out to pay for it.

6 MEMBER MAYNARD: I would like to just add  
7 on to Tom's previous comment just a little bit. It  
8 doesn't surprise me. And I would expect the industry  
9 to resist new requirements, new changes to things. I  
10 think it better to get the fight over, have it once,  
11 rather than a lot of times.

12 So, rather than dealing with a lot of  
13 things through staff guidance, generic letters, a lot  
14 of times it would be better if this is going to be a  
15 new expectation, new requirement, let's follow the  
16 process and make that -- you know, get the fight over  
17 with once, make it happen, rather than continually  
18 trying to go around these systems just generically.

19 MEMBER SIEBER: The requirement has always  
20 been there. And it stems from the code requirement.  
21 The question is, what do you do and how do you do it  
22 to give yourself a reasonable assurance that you're  
23 okay.

24 MR. GILLESPIE: The new aspect now is  
25 people having to articulate in an aging management

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1 program what they're going to do to ensure that their  
2 monitoring and measurement process for this liner will  
3 detect its approach to minimum wall thickness prior to  
4 it getting there.

5 I mean, that's really what plant license  
6 renewal is, to ensure that you have the additional  
7 monitoring programs in place that you will detect and  
8 correct prior to exceeding that minimum wall  
9 thickness.

10 The discussion of this ISG between us and  
11 the industry is evoked. I think it has now gotten us  
12 to a point where we have some actual cases under our  
13 belt that have now, you might say, set the standard  
14 for the next ones to come in.

15 And now we've got each plant evaluating  
16 itself against the plants we have already looked at  
17 and saying, "Am I like them? Am I different? If I'm  
18 different, then is it a positive difference or  
19 negative difference?"

20 And now we're starting to get those kind  
21 of aging management considerations into this piece of  
22 equipment, which we did not have, quite honestly,  
23 going in until we hit Browns Ferry.

24 The Committee wants -- Mario will remember  
25 this. I forget which BWR they were in. It was on the

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1 steam dryers. And I used the Committee. I quoted the  
2 Committee to the staff on the liner. And it was on  
3 the dryers.

4 And, Mario, I forget. You might have been  
5 the one who said it. You said it's large, it's  
6 passive, and you just wrote a generic letter saying  
7 it's safety. It wasn't in scope before that statement  
8 was made. It's now in scope. And, you know, the  
9 staff said it's large, it's passive, it has corrosion,  
10 and it's safety. And so now we're trying to take it  
11 on head on. I think with some success, you're seeing  
12 the applications getting it addressed at some level of  
13 credibility now.

14 MR. THADANI: Graham, I have one quick  
15 question.

16 Frank, you noted this is a high-dose area.  
17 This issue is one important in many ways, has I think  
18 rather minimal risk to public. How is that sort of  
19 balanced in terms of the actions called for and its  
20 relative importance?

21 MR. GILLESPIE: I think how we are trying  
22 to deal with that -- and we have got a meeting with  
23 one applicant day after tomorrow, Oyster Creek, on  
24 this, on our residual concerns after their RAIs. And,  
25 really, what we started talking about was the

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1       uncertainties involved in the decision.

2                   And so the question really is, how much  
3       should you pay for certainty in a decision? Because  
4       the significant measurement uncertainty and doing  
5       these UT exams, they're actually fairly coarse.

6                   There is uncertainty in primers and  
7       liners, which have exceeded, basically, the  
8       manufacturer-recommended lives of 10 to 15 years.  
9       Yet, they're still there. And they're still being  
10      inspected doing what they're doing.

11                  There is uncertainty in have you picked  
12      enough selected locations because we are looking for  
13      a general area degradation. We're not looking for  
14      just pitting.

15                  The Committee didn't mention it, but there  
16      are really two concerns. One is pressure retention  
17      and accident. And the other is buckling, the sheer  
18      collapsing of this thing under its own weight. And so  
19      you've got two reasons to inspect two different areas.

20                  And so I would suggest that in this ISG  
21      and what we're seeing from these utilities, we're  
22      actually accepting, you might say, a fair level of  
23      uncertainty in it to keep it rational.

24                  And so the safety consideration is in how  
25      much do we want to press people to make it more and

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1 more certain. And so that's really how we're  
2 factoring in the safety significance of it.

3 When I talk about dose and how many  
4 measurements need to be taken, we need reasonable  
5 assurance. And in many cases, there's not positive  
6 evidence on either side because this is a large  
7 passive thing that was put in there. It's expected to  
8 last forever fundamentally from the designer's point  
9 of view. We're confirming that assertion.

10 CHAIRMAN WALLIS: It probably will in most  
11 plants last.

12 MR. GILLESPIE: In most plants, I think it  
13 will. And so it's a confirmation. And so we're not  
14 designing the plant, which is very vigorous. We're  
15 confirming that the expected performance will be  
16 sustained. And we probably can be slightly less  
17 rigorous in the uncertainty we accept on that.

18 CHAIRMAN WALLIS: That is all the agency  
19 ever does. It doesn't design plants.

20 MR. GILLESPIE: Right.

21 CHAIRMAN WALLIS: It confirms performance.

22 MR. GILLESPIE: But you learn how much,  
23 what you're going to do in that confirmation.

24 MEMBER BONACA: Yes.

25 CHAIRMAN WALLIS: I think we may have gone

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1 over. We have gone over 15 minutes. I think it's  
2 about time we --

3 MEMBER BONACA: One last comment I had was  
4 that, you know, so many of the -- however the  
5 inspection processes we still depend on, for example,  
6 the visual inspection of this, we are still at the  
7 pace that really was conceived at the moment these  
8 plants are put in renewal. Okay? So every ten years  
9 they go in and look at it. Okay?

10 To me, you know, as these plants get older  
11 and older, these inaccessible areas, et cetera, you  
12 know, then maybe the frequency with which we're  
13 looking at it becomes more questionable because, you  
14 know, every ten years, a lot of things can happen.

15 CHAIRMAN WALLIS: Especially when you  
16 start to find things.

17 MR. GILLESPIE: We have occasions in  
18 several licensees where because they were sticking to  
19 a more extended inspection period, even when they had  
20 evidence of water, they did not consider evidence of  
21 water equivalent to accelerated corrosion visually.

22 So this ISG actually tries to take the  
23 principle you just espoused and says, "You can no  
24 longer in our expectation, staff's expectation, you  
25 can no longer ignore the presence of water. You have

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1 to now give us positive confirmation that the rate of  
2 degradation is still being minimized.

3 CHAIRMAN WALLIS: It is not boric acid.

4 MR. GILLESPIE: Yes, yes. At least we're  
5 dealing with a general moisture.

6 CHAIRMAN WALLIS: Right.

7 MR. GILLESPIE: And so this actually does  
8 go for that extended period to some incidents in which  
9 we actually have evidence from various licensees.  
10 They had evidence of water and basically did an  
11 engineering evaluation and did not obtain positive  
12 information if the thickness was okay.

13 MEMBER BONACA: What are you going to do  
14 when one of the already approved license renewals is  
15 going to come in for another license renewal?

16 MR. GILLESPIE: They have talked to us  
17 about that.

18 MEMBER BONACA: Well.

19 MR. GILLESPIE: I'm hoping to be retired  
20 by that point.

21 MEMBER BONACA: Anyway, I think we will  
22 see how this works.

23 MR. GILLESPIE: I started with the draft  
24 of the renewal rule in 1989 and have been doing this  
25 now for the last five years. At some point, someone

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1 else should do it.

2 MEMBER BONACA: All right.

3 MR. GILLESPIE: Thank you.

4 MEMBER BONACA: I give you back the  
5 meeting, Mr. Chairman.

6 CHAIRMAN WALLIS: We are ready to come off  
7 the record. Thank you very much for recording the  
8 meeting today, and we will take a break until a  
9 quarter to 5:00.

10 And when we come back, we will finish  
11 Mario's letter, which seems to be fairly  
12 straightforward. And then we will know where we are  
13 going with the other letter, hopefully know well  
14 enough that we can see our way to the end of it  
15 tomorrow.

16 (Whereupon, the foregoing matter was  
17 concluded at 4:34 p.m.)

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# Official Transcript of Proceedings

## NUCLEAR REGULATORY COMMISSION

Title: Advisory Committee on Reactor Safeguards  
533rd Meeting

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS (ACRS)

533rd MEETING

+ + + + +

WEDNESDAY, MAY 31, 2006

+ + + + +

ROCKVILLE, MARYLAND

+ + + + +

The Subcommittee met in Room T2B1 at Two White Flint North, 11555 Rockville Pike, Rockville, Maryland, at 8:30 a.m., Graham B. Wallis, Subcommittee Chair, presiding.

MEMBERS PRESENT:

- GRAHAM B. WALLIS Chairman
- WILLIAM J. SHACK Vice Chairman
- GEORGE E. APOSTOLAKIS Member
- J. SAM ARMIJO Member
- MARIO V. BONACA Member
- RICHARD S. DENNING Member
- THOMAS S. KRESS Member
- OTTO L. MAYNARD Member
- JOHN D. SIEBER ACRS Member-At-Large
- JOHN LARKINS Designated Federal Official

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1       ACRS STAFF PRESENT:

2       HANS ASHAR                    NRR

3       DANIEL FRUMKIN                NRR

4       ALEX KLEIN                    NRR

5       THOMAS KOSHY                 EEEEB/DE/NRR

6       MICHAEL MAYFIELD             DE/NRR

7       GEORGE MORRIS                EEBE/DE/NRR

8       LINH TRANS                    NRR

9       GEORGE WILSON                NRR

10      ROBERT WOLFGANG             NRR

11      ROY WOODS                     RES

12

13      ALSO PRESENT:

14      HAROLD BARRETT               Duke Power Company

15      MIKE FALLON                  Constellation Energy

16      ALEX MARRION                 NEI

17      DAVID MISKIEWICZ            Progress Energy

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AGENDA ITEMS

PAGE

Opening Remarks, Chairman Graham B. Wallis . . . 4

Draft Final Generic Letter, "Post-Fire  
Safe-Shutdown Circuit Analysis  
Spurious Actuations" . . . . . 5

Draft Final Generic Letter 2006-XX,  
"Inaccessible or Underground Cable  
Failures that Disable Accident  
Mitigation Systems" . . . . . 149

Interim Staff Guidance on Aging Management  
Program for Inaccessible Areas of Boiling  
Water Reactor (BWR) Mark I Containment  
Drywall Shell . . . . . 195

Adjournment

## P R O C E E D I N G S

(8:31 a.m.)

CHAIRMAN WALLIS: The meeting will now come to order.

This is the first day of the 533rd meeting of the Advisory Committee on Reactor Safeguards. During today's meeting, the Committee will consider the following:

Draft Final Generic Letter, Post-Fire Safe-Shutdown Circuit Analysis Spurious Actuations, Draft Final General Letter, Inaccessible or Underground Cable Failures that Disable Accident Mitigation Systems, Interim Staff Guidance on Aging Management Program for Inaccessible Areas of Boiling Water Reactor Mark I Containment Drywell Shell, and Preparation of ACRS reports.

This meeting is being conducted in accordance with the provisions of the Federal Advisory Committee Act. Dr. John T. Larkins is the Designated Federal Official for the initial portion of the meeting.

We have received no written comments from members of the public regarding today's sessions. We have received a request from Alex Marrion, NEI, for time to make oral statements regarding the Generic

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1 Letter on Post-Fire Safe-Shutdown Circuit Analysis and  
2 the Generic Letter on Inaccessible or Underground  
3 Cable Failures that Disable Accident Mitigation  
4 Systems.

5 A transcript of portions of the meeting is  
6 being kept and it is requested that the speakers use  
7 one of the microphones, identify themselves, and speak  
8 with sufficient clarity and volume so that they can be  
9 readily heard.

10 I will begin with some items of current  
11 interest. In the items handed out to you, I notice  
12 that there is a speech by Commissioner Yatzko at the  
13 beginning. And at the end, there is an interesting  
14 article on various matters which complicate PWR sump  
15 evaluations.

16 Now in the middle of the day, we are going  
17 to have ethics training which is why the lunch break  
18 is so long today. And the ethics training is  
19 scheduled for between 12:15 and 1:30 so you should be  
20 here at 12:15 and ready to be trained in ethics.

21 That is the end of my prepared remarks.  
22 And I'd like to proceed with the meeting. Call on  
23 Rich Denning to get us started on the first item.

24 MEMBER DENNING: Thank you. We will be  
25 hearing from the staff regarding the draft final

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1 generic letter 2006-XX, Post-Fire Safety-Shutdown  
2 Circuit Analysis Spurious Actuations. The Committee  
3 will hear presentations by and hold discussion with  
4 representatives of the staff.

5 Additionally, Mr. Alex Marrion with NEI,  
6 has requested ten minutes to share NEI's perspective  
7 after the staff's presentation.

8 The Committee had requested to review the  
9 generic letter regarding Post-Fire Safe-Shutdown  
10 Circuit Analysis Spurious Actuations after the public  
11 comment period. We did not have a prior subcommittee  
12 meeting on this letter which may have been a mistake.

13 I have serious reservations about the  
14 balance between regulatory burden and approved safety  
15 associated with this letter. The letter leaves open  
16 options for risk informing this process but they are  
17 not easy activities to perform. So we are anxious to  
18 hear what the staff has to say on this. And to have  
19 a healthy discussion, I believe.

20 We have a considerable period of time  
21 actually to do this, three hours. But I think that we  
22 will want to look into this letter very carefully  
23 before giving our blessing.

24 I think we are now ready to hear from  
25 staff. And I'll turn it over to Alex Klein of the

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1 Office of Nuclear Reactor Regulation.

2 MR. KLEIN: Thank you very much. My name  
3 is Alex Klein. You see on the cover slide here my  
4 branch chief's name, Sunil Weekakkody. He extends his  
5 regrets for not being able to attend today's meeting  
6 in that he had a prior commitment for jury duty today.  
7 With that, I'm acting in his place so I will give the  
8 opening presentation.

9 The purpose of today's meeting and the  
10 presentation to the Committee is to present the final  
11 draft of Generic Letter 2006-XX, Post-Fire Safe-  
12 Shutdown Circuit Analysis Spurious Actuations. We are  
13 also here to obtain ACRS endorsement to issue the  
14 proposed generic letter.

15 I'd like to introduce the two primary  
16 staff members who will present today for NRR. To my  
17 left is Robert Wolfgang who is the primary author of  
18 the generic letter. And to my right is Daniel  
19 Frumkin, fire protection engineer, from the Office of  
20 NRR, who will speak to you about some of the NEI and  
21 EPRI fire testing.

22 We also have in the audience with us  
23 supporting staff members from NRR who were also  
24 instrumental in the development of this generic  
25 letter.

1           As an overview, I wanted to advise the  
2           Committee that there is a lot of history leading up to  
3           this generic letter. And you will hear some of this  
4           today. We did a bounding analysis, full of risk. We  
5           also did a regulatory analysis of the generic letter.  
6           But at this time, those slides are not in our  
7           presentation. But we are certainly prepared to  
8           discuss those aspects.

9           MEMBER DENNING: We absolutely would like  
10          to see those slides.

11          MR. KLEIN: Very good.

12          So the probability of spurious actuations  
13          due to fires will be presented by Dan Frumkin after I  
14          speak. And then after Dan speaks, we will receive a  
15          summary of the objectives of the generic letter by Bob  
16          Wolfgang.

17          Again, based upon the long history of this  
18          generic letter and so forth, there has been differing  
19          views between the industry and the NRC on the  
20          credibility of multiple spurious actuations. You will  
21          hear about the NEI/EPRI cable fire test results from  
22          Dan Frumkin, as I indicated.

23          I also wanted to indicate to the Committee  
24          that we are continuing with our inspections using  
25          risk-informed aspects. For example, RIS 2004-03,

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1 certainly one of the goals of issuing this generic  
2 letter is to reestablish compliance with the  
3 regulations.

4 That concludes my introductory remarks.  
5 And I'll hand over the presentation to Dan Frumkin.

6 CHAIRMAN WALLIS: When you present, could  
7 you make it clear to me just what it is you are asking  
8 industry to do because I had a lot of trouble figuring  
9 that out. There is a lot of sort of rather vague  
10 requirements it seems to me. And perhaps you can in  
11 your presentation make it clear just what it is they  
12 have to do.

13 MR. KLEIN: Yes.

14 MR. FRUMKIN: Good morning. My name is  
15 Dan Frumkin from the Office of NRR. I work for Sunil.  
16 And today I'm going to present some of the background  
17 from the NEI/EPRI testing that is discussed in the  
18 generic letter.

19 I see some new faces around the ACRS table  
20 so I'm going to pass around some tables from some  
21 testing that occurred. At the end of the cables that  
22 are fused together, you will be able to see two  
23 failure modes or examples of two failure modes. One  
24 is an inter-cable which is two cables -- or actually  
25 one is an intra-cable, which we use these terms intra

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1 within a single cable and inter between two separate  
2 cables. And this provides an example of both.

3 The highlighted portions within a cable  
4 are very close together that have failed together.  
5 And then we also have intruding cable that has  
6 penetrated the outer jacket and apparently the inner  
7 cable protection and come at least into very close  
8 contact which you can see.

9 We will talk also about the different  
10 types of cable. This is a thermal plastic cable,  
11 which is the more vulnerable cable, but as you can  
12 see, that it is subject to both failures from internal  
13 and external cables when put under the suitable heat  
14 or fire exposure.

15 So I'll be providing some background on  
16 the testing that provided the insight into the failure  
17 likelihoods, the objectives of that testing, some  
18 details of the testing, some of the test results, and  
19 a few conclusions based on the testing.

20 And then Mr. Wolfgang will be talking  
21 about the generic letter more specifically.

22 The NEI/EPRI testing was intended to  
23 address fire-induced circuit failure issues of concern  
24 to the NRC staff, principally the potential for  
25 spurious operations of equipment.

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1           This was intended to basically bring to  
2 close the question that the staff kept on bringing up  
3 that Browns Ferry had these and the industry said that  
4 well, it is very unlikely to occur. So this was  
5 intended to bring that to a close.

6           NRC witnessed the testing and also did  
7 some insulation resistant testing using Sandia  
8 National Laboratory resources.

9           And there are four documents that either  
10 in whole or in part document the results of some of  
11 the testing. The characterization of fire-induced  
12 circuit failures results is the big report from EPRI.

13           The circuit analysis failure modes and  
14 likelihood analysis is the Sandia Report of their  
15 insulation resistant testing.

16           These results were pulled into the NUREG  
17 6850, which is the fire protection re-quantification  
18 or the fire PRA methodology for nuclear power  
19 facilities. This is the state-of-the-art document  
20 that Research has developed to -- it is a handbook on  
21 how to do fire PRA.

22           And then there was the spurious actuation  
23 expert elicitation which was experts reviewing the  
24 testing and coming up with results.

25           The objectives, as I said, was to research

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1 the characteristics of fire-induced circuit failures  
2 to better understand these plants' responses to cable  
3 failures. And, as I said, the NRC also was involved  
4 in the testing and reviewed -- witnessed the testing  
5 and did their own insulation resistant testing.

6 So the details of the test, there were 18  
7 fire tests that were conducted between January 9th,  
8 2001 and June 1st, 2001 at the Omega Point  
9 Laboratories in San Antonio. And the three types of  
10 fire exposures were tested during the test. The hot  
11 gas layer region which is up at the ceiling level, the  
12 fire creates a buoyant plume and it fills the  
13 enclosure from the top down. And that is the hot gas  
14 layer.

15 Then below -- between the fire -- the  
16 actual fire and the hot gas layer is what we call the  
17 plume region where there is no flaming but that is a  
18 very hot part of the -- that is the hottest part of  
19 the smoke region of the fire.

20 And they also tested a radiant exposure  
21 where you get close to the fire itself or sometimes  
22 worst case could be up next to the plume region  
23 depending on emissivity of the smoke and the radiant  
24 energy coming off. If it is a clean burning flame, it  
25 may not have a high radiant energy but the smoke may

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1 be higher. So -- but they just used, I believe, a  
2 fixed radiant number but that is a little discussion  
3 of the radiant energy.

4 One thing that they didn't do that I will  
5 add is they did not put cables in the flaming region.  
6 That is why I have this highlighted. We, the staff,  
7 hear a lot from the licensees about how long it takes  
8 to have these cables fail. And that there is plenty  
9 of time in all situations for mitigation.

10 And based on the testing, yes, in a lot of  
11 the testing there was a lot of time before there was  
12 failure in, you know, 30, 40 minutes for some of the  
13 tests. But none of the tests tested this flaming  
14 region.

15 So this leaves the staff a very strong  
16 question of how fast -- well, first we don't know what  
17 failures will occur in that region. They could occur.  
18 They may not occur. We don't have the information.

19 It is very clear that if they do occur,  
20 they will occur much more quickly. The temperatures  
21 are over, you know, much -- a thousand degrees hotter  
22 in the flaming region. And there is also an ignition  
23 source. So it is a very different phenomenon. And  
24 cables could be exposed to a flaming region in the  
25 plant.

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1           So this test is not a complete picture of  
2           -- or let me just say that the timing factors that  
3           came out of the testing that was done are not a  
4           complete picture of the possible scenarios that could  
5           occur.

6           MEMBER APOSTOLAKIS: It appears that you  
7           were participating in the conduct of these tests. Did  
8           you express these concerns to EPRI when they were  
9           designing the tests?

10          MR. FRUMKIN: Well, I wasn't specifically  
11          involved in that. I don't believe that the test was  
12          intended to develop timing. And as such, it wouldn't  
13          have been an issue. The licensees or the industry has  
14          brought this timing issue and perhaps inappropriately  
15          based on the testing.

16          It is useful to heat this cable slowly  
17          because then the hot shorts would probably exist for  
18          a longer period of time. But whether this -- but my  
19          only point is that I don't believe that this testing  
20          provides a basis to say that hot shorts -- this test  
21          I don't think was intended or can provide a basis for  
22          timing. But I believe it is being applied or some  
23          intend to use it to show that there is a timing issue.

24          MEMBER APOSTOLAKIS: I would be such an  
25          obvious thing to do. I mean there must be a reason

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1 why they didn't do it. Do you know that? Or should  
2 we ask Mr. Marrion when he comes?

3 MR. FRUMKIN: Why they didn't do the  
4 flaming region? Yes, that is a fair question. But I  
5 believe the answer -- like I said, I do think that  
6 that was not -- if there hadn't been any failures  
7 outside of flaming region, I think there would have  
8 been a strong feeling that failures in the flaming  
9 region would have been maybe less likely. But it is  
10 a fair question.

11 MEMBER APOSTOLAKIS: Okay.

12 CHAIRMAN WALLIS: Does the material from  
13 which the insulation is made, does that actually burn  
14 at some temperature?

15 MR. FRUMKIN: Yes.

16 CHAIRMAN WALLIS: But if you stuck it in  
17 a flame, you would expect the insulation itself to  
18 catch fire.

19 MR. FRUMKIN: Yes. The ASTM -- or, I'm  
20 sorry, the IEEE 383 fire test that has been the  
21 standard fire test is actually a burning test. And it  
22 ignites the flames from the bottom in a vertical cable  
23 tray. And all the cables do catch on fire when  
24 exposed to flame. But some of them propagate more or  
25 less slowly.

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1           There are some specialized cables that  
2 don't catch on fire but those were not tested. Those  
3 aren't what we are talking about here.

4           So the results of the tests showed with  
5 some confidence that failures within multi-conductor  
6 cables are likely and when they do occur, they occur  
7 in multiple conductors within the same multiple  
8 conductor cable. So as you can see from that cable  
9 bundle, there may actually be more than one cable  
10 conductor within the cable further down the jacket  
11 that you can't see.

12           And then the way they are spiraled  
13 together in there so that various cables could come in  
14 contact with other cables within the same cable.  
15 Various conductors could come into contact with other  
16 conductors within the same cable.

17           In addition, multiple devices were shown  
18 -- the spurious actuation data showed that a single  
19 hot short within a multi-conductor cable usually  
20 effected actuation devices simultaneously. If there  
21 were two devices -- I believe the way they set this  
22 test up is they wanted a very practical approach.

23           So they actually put -- rather than doing  
24 similar to the Sandia testing where they used an  
25 insulation-resistance device, they used actual plant

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1 equipment, which they just plugged it in as they would  
2 in the plant and if it would actuate or not actuate.  
3 So it was a real pragmatic thing and they did actuate.  
4 And as the testing showed, some actuated  
5 simultaneously.

6 MEMBER MAYNARD: Did they also measure how  
7 long the signal stayed there? Or how long it  
8 actuated?

9 MR. FRUMKIN: Yes. And most of the hot  
10 shorts were of a short duration. And some were in the  
11 order of minutes, I believe.

12 This is a table of results of the best  
13 estimates given cable damage of a spurious actuation  
14 probability. And the purpose of this table is not to  
15 -- the purpose of this table is just to show that the  
16 NRC and the industry -- or at least the results from  
17 the EPRI report which was developed by industry, are  
18 very consistent.

19 The staff and the risk people in industry  
20 really are on the same page with the likelihood of  
21 spurious actuations. There are some factors of two  
22 here, differences, but in probabilistic and  
23 likelihoods, in that world it is a small difference.

24 CHAIRMAN WALLIS: This is strange to me.  
25 It must depend on the extent of the damage. I mean if

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1 you just burn a cable for a short time, nothing  
2 happens. If you burn it for long enough, you are  
3 going to get shorts. So you can't just have a  
4 probability. It is going to depend on the extent of  
5 the damage to the cable.

6 MR. FRUMKIN: Yes. In all these, cables  
7 were exposed to damage. So this is given that these  
8 cables were damaged.

9 CHAIRMAN WALLIS: But to what extent?

10 MEMBER APOSTOLAKIS: It is a critical  
11 probability. I mean -- or, as you said earlier --

12 PARTICIPANT: At some point the  
13 probability is one, right?

14 MEMBER APOSTOLAKIS: I mean there is a 0.6  
15 conditional probability that you will have a spurious  
16 actuation. This is conditional on the probability  
17 that the cable is damaged.

18 MR. FRUMKIN: Correct.

19 MEMBER APOSTOLAKIS: And what is that?

20 MR. FRUMKIN: That depends on the  
21 scenario. For example, if a cable is a foot above a  
22 piece of switch gear or let's say -- and this is not  
23 an unlikely situation -- a foot above 20 or 30 feet of  
24 switchgear. It runs across the cable tray, across the  
25 top of a number of pieces of switchgear, what is the

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1 probability?

2 Well, that could be calculated typically,  
3 I think, a single piece of switchgear is five times E  
4 to the minus five. Or, you know, in that range. But  
5 then it certainly would be damaged if there was even  
6 a small fire in that piece of switchgear.

7 So there is -- you could have cable -- and  
8 then that same cable does go through different areas  
9 where it could be exposed to different other fires.  
10 A single cable could go through three, four, five  
11 different areas and be exposed to a dozen different  
12 fire scenarios.

13 MEMBER DENNING: I think we have to  
14 recognize the context within which this is done,  
15 George. And I think it is important when we try to  
16 get into the question of risk informing this and that  
17 is basically we are doing a deterministic safe  
18 shutdown analysis in which you assume there is a fire  
19 in a zone -- in a fire area. And it can burn there  
20 for three hours. You know even though there are other  
21 mitigating things that would clear that, we assume it  
22 can burn for three hours.

23 So then the question is well, with this  
24 massive potential exposure, then you have got a cable  
25 running through there. What's the potential that it

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1 could then be heated up to a point at which you get  
2 this kind of interaction? You know it doesn't get at  
3 all into the questions of you have a fire in a room,  
4 what is the possibility that any cables are exposed,  
5 you know, before it is controlled.

6 MEMBER APOSTOLAKIS: But if we are doing  
7 a deterministic analysis, why are we calculated  
8 spurious actuation probabilities?

9 MEMBER DENNING: Well, let me give my view  
10 but I'd certainly like to hear your view, and that is  
11 that the question is not so much whether you can have  
12 spurious actuations but how many can you have? How  
13 many combinations of things can you deal with?

14 The industry has always agreed to looking  
15 at a spurious actuation on a one-at-a-time basis, you  
16 know. And so I think that what the staff is trying to  
17 do is to give the feeling that -- or their impression  
18 that this isn't the really rare event -- the extremely  
19 rare event that actually would have some kind of  
20 spurious actuation occurring.

21 And then I think by implication then maybe  
22 there is the potential for multiple spurious  
23 activations.

24 MEMBER APOSTOLAKIS: Well, the second  
25 bullet of the previous slide, I guess, is then the

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1 key, right? Is that what -- of devices?

2 MEMBER DENNING: Well, I would be curious.  
3 What is your -- if you were answering that question,  
4 how would you have answered George's question? Why  
5 are we looking at probabilities here now?

6 MR. FRUMKIN: Well, okay, maybe this slide  
7 was poorly planned. But the point of the slide is  
8 twofold. One is to say that with regard to  
9 probabilities, the staff and the industry people who  
10 do this work are on the same page.

11 And the second reason, I guess, is to show  
12 that these probabilities are very high in  
13 probabilistic space, that some of them are close --  
14 you know, 0.6, and then if you have a 0.6 scenario and  
15 you have two 0.6 scenarios, you've got a 0.36  
16 scenario. So that even multiple can be a fairly high  
17 probable.

18 MEMBER DENNING: Now help us though -- you  
19 can't say that without giving some conditionality of  
20 --

21 MR. FRUMKIN: Right.

22 MEMBER DENNING: -- 0.6 conditions on  
23 what?

24 MR. FRUMKIN: Cable damage.

25 MEMBER DENNING: Cable damage.

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1                   MEMBER ARMIJO: I have a problem with  
2 cable damage. Is this severe? Moderate? I have no  
3 feeling of -- I can see where all the insulation is  
4 burnt to a crisp and I would call that severe.  
5 Wouldn't these probabilities all be one?

6                   MR. FRUMKIN: No. Well, okay, so what  
7 this is talking about is the spurious actuation  
8 probability, not shorting situation. This is the  
9 likelihood of a hot short occurring within a cable  
10 without that cable shorting to its conduit or cable  
11 tray because generally once the hot conductors fail to  
12 the conduit or cable tray or the nearest ground, then  
13 they would certainly -- that would clear the spurious  
14 actuation.

15                  MEMBER MAYNARD: Okay. But I think there  
16 is a high probability if you make all the assumptions  
17 to get to this point. But you also have to factor in  
18 the probability of actually having a fire, for the  
19 fire going that long, for the operators not taking any  
20 action. There are a lot of other things getting up to  
21 that point that when you put it all in context --

22                  MEMBER APOSTOLAKIS: That is why I'm  
23 confused. We are either doing deterministic analysis  
24 or we are doing risk analysis. If we do risk  
25 analysis, then, of course, we have to do all this. If

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1 we do what Rich said, then it seems to me they are  
2 gone.

3 I mean you have three hours. Everybody is  
4 burning, right? I think as I recall from the early  
5 studies on this the real question is whether you will  
6 have a short -- a hot short first before an open  
7 circuit.

8 MR. FRUMKIN: Right. Before the short  
9 ground.

10 MEMBER APOSTOLAKIS: That is the critical  
11 thing.

12 MR. FRUMKIN: Yes.

13 MEMBER APOSTOLAKIS: And this is not  
14 answering that, is it?

15 MR. FRUMKIN: Yes, it is.

16 MEMBER APOSTOLAKIS: It is?

17 MR. FRUMKIN: This is the likelihood of  
18 that spurious actuation probability, not a short to  
19 ground.

20 MEMBER APOSTOLAKIS: Okay.

21 CHAIRMAN WALLIS: This is one spurious  
22 actuation.

23 MR. FRUMKIN: This is a single.

24 CHAIRMAN WALLIS: A single one although  
25 there are multiple wires in the cable?

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1 MR. FRUMKIN: Right. Well, this is a  
2 spurious actuation getting cable to damage within a  
3 cable or between -- there is an inter-cable factors  
4 here -- between two cables. So the point -- let's  
5 just say the 0.6 here is for within a single thermoset  
6 cable, the 0.2 or the 0.4, as the 6850 has it, is  
7 between -- or generally it is 0.3 is what has been  
8 used a lot -- is between two separate thermoset cables  
9 within the same tray.

10 And what the previous slide was trying to  
11 say is that within a single thermoset -- within a  
12 single multi-conductor cable, that more than one of  
13 the conductors are going to fail together with an 80  
14 percent likelihood. So it almost for sure that if  
15 let's say you have one hot conductor and four control  
16 conductors that could actuate four different pieces of  
17 equipment, that hot conductor will come into contact  
18 probably with all of them with the same likelihood,  
19 with this same 0.6.

20 CHAIRMAN WALLIS: Oh, with the same  
21 likelihood?

22 MR. FRUMKIN: Yes. It's not a 0.6 times  
23 0.6 times 0.6 in the same cable. Within that cable it  
24 is 0.6 times 0.8, if you will.

25 CHAIRMAN WALLIS: Okay.

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1 MR. FRUMKIN: So it is still -- it is  
2 almost 0.6.

3 MEMBER DENNING: Why are the inter-cable  
4 probabilities the same for thermal plastic and  
5 thermoset?

6 MR. FRUMKIN: Because -- oh, you mean this  
7 and this?

8 MEMBER DENNING: Yes.

9 MR. FRUMKIN: Inter-cable -- yes, I'm not  
10 -- that's just a -- well, intra-cable is very likely  
11 --

12 MEMBER DENNING: Intra-cable, I understand  
13 that.

14 MR. FRUMKIN: Yes, I don't -- I don't have  
15 --

16 CHAIRMAN WALLIS: What is the question,  
17 Rich?

18 MEMBER DENNING: It's thermoset is less  
19 likely -- one would think thermoset would be less  
20 likely to have inter-cable and perhaps they are the  
21 same here because there just haven't been any  
22 experiments done on a thermoset.

23 MR. FRUMKIN: I think that is it because  
24 you can see that that is one of the big differences,  
25 a factor of two here, and again the same factor of two

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1 for intra-cable -- inter-cable -- but yes, we're -- as  
2 Roy Woods is here, and we're doing more testing on  
3 this. But this is currently the state-of-the-art data  
4 on this.

5 And I can't explain the -- it's just that  
6 is what the data showed from the limited 18 tests.

7 CHAIRMAN WALLIS: Now we are talking about  
8 whether you are doing probabilistic or deterministic  
9 analysis. When we get to the generic letter, there  
10 are strange terms such as saying the licensee must  
11 assume the possibility of simultaneous multiple  
12 spurious actuation -- well that tells me nothing.

13 I'm assuming the possibility -- it says  
14 nothing about whether it is likely to be one or 0.6 or  
15 whatever.

16 MEMBER DENNING: What they are saying is  
17 one.

18 CHAIRMAN WALLIS: What does it mean?

19 MEMBER DENNING: It means one.

20 CHAIRMAN WALLIS: So possibility means a  
21 probability of one?

22 MEMBER DENNING: That's -- yes.

23 CHAIRMAN WALLIS: That wasn't clear to me  
24 at all. Okay.

25 MEMBER APOSTOLAKIS: We will come to the

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1 letter, I guess.

2 MEMBER DENNING: Yes. Continue.

3 MR. FRUMKIN: These are just some notes on  
4 the previous slide that some of the plants that use  
5 the CPTs, which are the control power transformers,  
6 that reduces the likelihood of spurious actuations.

7 MEMBER APOSTOLAKIS: All of these  
8 probabilities, of course, mean nothing now.

9 MR. FRUMKIN: Right, yes.

10 MEMBER APOSTOLAKIS: They are one.

11 MR. FRUMKIN: Okay. Well --

12 MEMBER DENNING: But we are going to get  
13 to risk informing at some point here.

14 MR. FRUMKIN: Absolutely. Right. So  
15 those were just notes on the previous slide which was  
16 unfortunately put in here.

17 In conclusion, a review of the test data  
18 readily illustrates that hot shorts often involve more  
19 than one conductor. And that concurrent hot shorts  
20 within a cable are probable and should be considered  
21 during circuit analysis.

22 That's the end of this presentation. And  
23 the point of this is just to lay the groundwork that  
24 simultaneous spurious actuations and simultaneous  
25 multiple spurious actuations have been shown by

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1 testing, by industry testing, to occur.

2 MEMBER DENNING: Now there is more testing  
3 that is in progress. It is your feeling that that  
4 testing could then -- will it be done within a time  
5 period where we add value to the licensee when the  
6 licensee is basically responding the generic letter?

7 MR. FRUMKIN: Yes, that testing is planned  
8 to be done by the end of the year. And that pool of  
9 data will be available -- certainly for risk-informed  
10 evaluations for the licensees to use. But the experts  
11 doing the testing don't believe that there is going to  
12 be -- they believe these numbers are going to be  
13 honed.

14 They believe that there are going to be  
15 more cable combinations tested here than in the 18  
16 EPRI tests -- EPRI/NEI tests. But they don't believe  
17 that for the information that was on that table are  
18 going to be changed by an order of magnitude. It's  
19 maybe a 50 percent change or something of that nature.

20 MEMBER DENNING: If we have time later on,  
21 could we have a short presentation by someone about  
22 what is still to happen? And what different  
23 configurations basically have been untested at this  
24 point that will be tested?

25 MR. FRUMKIN: Well, Roy Woods is sitting

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1 behind you. And I'm not sure if he is prepared to  
2 talk about this testing.

3 MEMBER DENNING: Let me say I'm not asking  
4 for you to do it right now. But do you think you  
5 could do it later?

6 MR. WOODS: Sure. Roy Woods, RES. Yes,  
7 certainly we can make a presentation to you whenever  
8 you want on the testing. The plans are well made. We  
9 are about to start within days or a week at most. It  
10 is actually about to happen.

11 MEMBER DENNING: Okay. Well, let's go  
12 ahead --

13 MR. FRUMKIN: I think they want something  
14 later this morning, right?

15 MEMBER DENNING: Yes, later this morning.  
16 Absolutely, yes. Later this morning.

17 MEMBER APOSTOLAKIS: That's what happens  
18 when you have three hours.

19 MEMBER DENNING: Right, yes. Thanks. Can  
20 you run any of those tests by eleven?

21 MR. WOLFGANG: My name is Bob Wolfgang.  
22 I'm a fire protection engineer in NRR. And I'm going  
23 to give you information on the draft generic letter  
24 Post-Fire Safe-Shutdown Circuit Analysis Spurious  
25 Actuations.

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1           A summary of the presentation, I'll go  
2 over the purpose of issuing the generic letter, the  
3 information we are requesting from licensees, the  
4 background on this issue since 1997, the basis for the  
5 generic letter, the issue that is clarified in the  
6 generic letter, public comments, and a summary at the  
7 end.

8           The purpose of issuing the generic letter  
9 is to clarify how the NEI/EPRI cable fire test program  
10 reaffirms long-held regulatory positions and provide  
11 part of a foundation for licensees who are planning to  
12 transition to NFPA 805.

13           Also, to respond to the Agency's need to  
14 provide clarification and closure of outstanding fire  
15 protection issues, respond to --

16           MEMBER APOSTOLAKIS: Excuse me. Are you  
17 going to come back to these? I mean this on slide 16,  
18 the foundation for licensees planning to transition,  
19 will you elaborate on these later? Or can you tell us  
20 a few words now?

21           MR. WOLFGANG: Well, that's --

22           MEMBER APOSTOLAKIS: Why is that relative  
23 to NFPA 805?

24           MR. WOLFGANG: This is just to show that  
25 multiple spurious actuations should be included in

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1 their risk analysis model.

2 MEMBER DENNING: Well, since George has  
3 raised the question, let me ask it now. And that is  
4 NFPA 805 is one of the ways -- transitioning to NFPA  
5 805 is one of the ways that a licensee can respond to  
6 this. Now my question is how long does it take to  
7 transition to NFPA 805?

8 And I don't quite understanding within the  
9 time periods of the 90 days and six months and this  
10 kind of stuff, within the context of a transition to  
11 NFPA 805, when did that transition actually have to  
12 occur for the licensee to be able to use that pathway?

13 MR. WOLFGANG: All they have to do is  
14 respond to us within I believe it is the 90 days.  
15 That they are transiting to NFPA 805. And they will  
16 take care of this situation during that process.

17 MEMBER DENNING: Then how long would they  
18 have to transition to NFPA 805?

19 MR. WOLFGANG: They have -- what is it?  
20 Is it three years?

21 PARTICIPANT: Three years.

22 MEMBER DENNING: Three years?

23 MEMBER APOSTOLAKIS: Yes, it is a long  
24 time.

25 MR. KLEIN: Let me describe briefly. This

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1 is Alex Klein. Let me briefly describe the process a  
2 licensee would use if he wants to transition to NFPA  
3 805. And that is once the licensee had made the  
4 determination that he does want to transition to 805  
5 because that is an option for him, if he submits a  
6 letter of intent to the agency indicating that that is  
7 what he wishes to do.

8 At that point, we review that letter and  
9 make a determination as to whether or not the schedule  
10 that the licensee has laid out is acceptable to the  
11 Agency. And what we have right now in place is a  
12 three-year time frame for licensees to transition with  
13 the option of extending that time frame if the  
14 licensee can provide us with sufficient justifications  
15 beyond the three-year time period.

16 Now within that three-year time period, a  
17 licensee would submit their letter of intend, do the  
18 act of transition into NFPA 805. And then before that  
19 three-year time period is over, we would submit their  
20 license amendment to the staff for our review and  
21 approval prior to them actually receiving the  
22 amendment.

23 MEMBER APOSTOLAKIS: It seems to me that  
24 the -- actually is the first bullet in the previous  
25 slide that is important because the licensee that

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1 wants to transition to NFPA 805 has to convince you,  
2 I think, that they complied with all the regulations,  
3 right? There may be a few exceptions, as I remember  
4 for a period of time, and all that.

5 So the primary reason seems to be to  
6 reaffirm long-held regulatory positions because  
7 somebody who wants to transition has to demonstrate  
8 that they complied with all that.

9 MR. KLEIN: That is correct. Really I  
10 think the primary purpose of the generic letter is  
11 that first bullet on that slide 16.

12 MEMBER APOSTOLAKIS: Right, right.

13 MR. KLEIN: Yes. As an added benefit, it  
14 does provide the foundation for licensees who want to  
15 transition to 805.

16 MEMBER DENNING: Now wait a second. I  
17 definitely did not understand this. I mean clearly  
18 there are a lot of licensees out there that did not --  
19 cannot respond to multiple spurious actuations. And  
20 they are not going to have to bring their plant into  
21 compliance with having to meet all the multiple  
22 spurious actuations before going to NFPA 805 because  
23 then NFPA 805 doesn't help them at all, right?

24 MR. FRUMKIN: Yes, that is correct. And  
25 what Dr. Apostolakis was saying is correct is that we

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1 have an enforcement discretion in place so those  
2 licensees who discover during transitions that they  
3 are not in compliance can do a risk analysis of that  
4 and determine that it is not red, that it is not  
5 wilful, that it is not a severity one violation.

6 And, therefore, they can comp it -- put  
7 compensatory actions in place and move forward towards  
8 transition without necessarily correcting that in  
9 accordance with the old fire protection program.

10 MEMBER DENNING: But one thing that I  
11 think is an issue though and that is suppose there is  
12 a plant out there that would really like to do the  
13 NFPA 805 approach but within the 90-day period, don't  
14 they have to go through the entire analysis and  
15 identify the SSCs that are potentially vulnerable  
16 based upon this detailed multiple spurious actuation  
17 evaluation which seems to me like an extremely  
18 difficult problem to undertake.

19 Is that true that they have to really  
20 analyze the whole system within 90 days according to  
21 this multiple spurious actuations and identify  
22 vulnerable SSCs? Am I correct or not correct?

23 MR. WOLFGANG: Well, they have to -- well,  
24 I'll get to that on a slide here.

25 MEMBER DENNING: Okay, if you will get to

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1 it, you can go ahead.

2 MEMBER MAYNARD: I would like to challenge  
3 that first statement just a little bit though. And I  
4 know that it has been a long-held position by members  
5 of the staff but as far as, you know, NRC position,  
6 there are a number of licenses that were issued and  
7 plants inspected and with their programs were approved  
8 and licensed without making this assumption.

9 And I'm not convinced that it has clearly  
10 been a recognized regulatory requirement. And again,  
11 I know licenses were issued, programs were reviewed  
12 without making -- otherwise, we wouldn't even be here  
13 today if those licenses weren't issued at that time.  
14 So I would challenge that. The first statement.

15 MR. WOLFGANG: We know SERs have been  
16 issued for Byron and Braidwood with a single spurious  
17 actuation per fire event. And we've come to the  
18 conclusion basically that was issued as a mistake.  
19 That was a mistake.

20 MEMBER MAYNARD: But I know that there are  
21 a lot of plants out there a license. Their analysis  
22 were reviewed, their programs were reviewed. I know  
23 I was personally involved with them back in the '80s  
24 when some of these issues were starting to come to a  
25 highlight. And I know that there are a number of

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1 plants out there with licenses that although it may  
2 not be documented as clearly, that it was known that  
3 multiple spurious actuations were not taken in account  
4 in that analysis.

5 I don't think it is clear that this is  
6 just confirming compliance to requirements that were  
7 in place. I think it is a different set of  
8 assumptions.

9 MR. FRUMKIN: Yes, and this may, I agree  
10 that your assumptions apply to probably a number of  
11 plants out there. But for the most part, Appendix R,  
12 10 CFR 50, Appendix R, Section 3(g)(ii) and 3(g)(ii)  
13 which is the alternate and dedicated shutdown are what  
14 is in question.

15 The NRC went in and did an analysis of the  
16 3(g)(iii) alternate shutdown. And for a lot of  
17 3(g)(iii) which is, for lack of a better description,  
18 a control room abandonment, they allowed the  
19 assumption of one spurious actuation. 3(g)(ii) wasn't  
20 across the board inspected in the 80s. It was assumed  
21 that licensees could wrap or protect or would have  
22 adequate separation.

23 And it wasn't evaluated for multiple  
24 spurious because generally the staff didn't believe  
25 that -- well, I'm not sure why they didn't do it. But

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1 the big question was this alternate shutdown.

2 And in the 90s, we had the thermal lag.  
3 And a lot of that wrap was taken out. And a lot of  
4 manual actions or assumptions were put into place.  
5 And I don't mean to say that there was -- well, the  
6 point that I am trying to make is that there was  
7 another change. There was the removal of a lot of  
8 these thermal lag which was relied on to protect  
9 cables and probably would have mitigated many spurious  
10 actuations, many multiple spurious.

11 MEMBER MAYNARD: And I'm not saying at  
12 this point that they shouldn't be considered now. I'm  
13 challenging the regulatory positions that says all  
14 along everybody should have always done this. I think  
15 that, you know, we're now setting, you know, these are  
16 the things that definitely need to be considered.

17 If those were considered 20, 30 years ago,  
18 if that was part of the regulatory position for the  
19 licenses, we wouldn't have gone through a 20-year  
20 period here of trying to figure out what it really  
21 requires the licensee to do. Again, it's a regulatory  
22 -- I believe that this is something that falls within  
23 the backfit.

24 It needs a better analysis overall. And  
25 that doesn't mean that it is a bad thing to do. I'm

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1 just saying that I do not believe that we can take the  
2 position that this is a requirement that has already  
3 been there, that everybody should have already done.  
4 And that is kind of what we are saying in this generic  
5 letter.

6 MR. KLEIN: This is Alex Klein of NRR. I  
7 just wanted to add to the discussion here that -- and  
8 Bob can clarify this also for me -- is that the  
9 generic letter did receive CRGR approval. We did go  
10 to that Committee.

11 There are subsequent slides in Bob's  
12 presentation, I think 23, 24, 25, that does talk  
13 about the background, the regulatory background that  
14 you are speaking of that might clarify some of these  
15 discussion questions.

16 MEMBER MAYNARD: I'd be glad to look at  
17 that.

18 MR. WOLFGANG: Well, and also attend CFR  
19 Part 50, Appendix R, it also talks about you have to  
20 consider hot shorts. It doesn't set a limit on the  
21 number.

22 MEMBER MAYNARD: Well, I understand that.  
23 But there is a number of the regulations that come to  
24 an agreement between the licensee and staff as to what  
25 are -- what do you have to assume in a number of those

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1 things.

2 So anyway, we will get into it maybe aq  
3 little more with the regulatory evaluation. But I do  
4 not agree that --

5 CHAIRMAN WALLIS: Well, could we clarify  
6 this first bullet? I mean it seems to me that if we  
7 did have this long-held regulatory position, which was  
8 being enforced, then you wouldn't need this generic  
9 letter.

10 MEMBER MAYNARD: Right.

11 CHAIRMAN WALLIS: So something has changed  
12 as the result of these tests. So maybe there was a  
13 position which wasn't very well enforced or something  
14 or was not properly interpreted by the industry. Is  
15 that the problem?

16 MEMBER MAYNARD: Or the staff?

17 CHAIRMAN WALLIS: Well, the staff, yes.

18 MR. FRUMKIN: Well, I think we -- well,  
19 Bob, I think I would say that something did change.  
20 And that thing may not have been entirely the tests.  
21 I think that the staff had high confidence that these  
22 fire barriers that were installed were separating  
23 these redundant trains.

24 And they were removed and they were  
25 replaced with non-barrier solutions which were

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1 analysis, manual actions, and those type of things.  
2 And as soon as the NRC started inspecting post-thermal  
3 lag fixes, which was in 1997, well before these tests.  
4 We had numerous -- there was an information notice  
5 97-something which presented numerous hot short and  
6 multiple -- well, numerous alternate associated  
7 circuits and circuit failure type issues.

8 So to hang this entirely on the test is  
9 not -- certainly the staff position goes before -- to  
10 before the tests. And that has been documented in  
11 that generic -- that information notice and there was  
12 a letter sent to NEI which expressed this sentiment  
13 well before -- I believe that was before the test as  
14 well.

15 CHAIRMAN WALLIS: The purpose of the  
16 generic letter is to reinforcement your enforcement  
17 which you were a bit lax about before or something?  
18 Is that what its purpose is?

19 MR. WOLFGANG: There was a lot of  
20 confusion. You were talking about 3(g)(iii) about  
21 alternative and dedicated shutdown systems and the use  
22 of one only -- you had to consider one spurious  
23 actuation there --

24 MR. FRUMKIN: Right, 3(g)(iii) and the  
25 Generic Letter 86-10 talked about spurious actuations

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1 quite a bit but the staff position is that those  
2 didn't apply to 3(g)(ii) and they were erroneously  
3 applied to 3(g)(ii), which is all we're really talking  
4 about right now. We are not talking about these 3(g)  
5 (iii) inspections that occurred in the 80s. We're not  
6 talking about the 3(g)(iii) approvals.

7 Every 3(g)(iii) program should have been  
8 approved with an SER. That was the policy. But we  
9 did not go into the 3(g)(ii) areas because the  
10 barriers and those solutions should have been  
11 sufficient.

12 MEMBER MAYNARD: It just seems to me that  
13 with all the confusion that has gone on for a number  
14 of years on this, a much cleaner way of doing this is  
15 if the NRC believes that this is something that needs  
16 to be done is just to come out with it as a  
17 requirement following the process for rulemaking, for  
18 changes, or whatever rather than trying to handle it  
19 through a generic letter requesting information to  
20 show compliance with a very confusing set of  
21 requirements.

22 MEMBER-AT-LARGE SIEBER: I suspect,  
23 though, that the staff does not believe that  
24 rulemaking is required, that the proper regulations  
25 already exist.

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1 MR. FRUMKIN: That is correct.

2 MEMBER-AT-LARGE SIEBER: In the review  
3 process that the staff has used in the past does not  
4 establish new regulations. The regulations are the  
5 regulations. And how the staff reviews something is  
6 another matter.

7 MEMBER MAYNARD: Well, how they review it  
8 but what it is accepted as to your certain assumptions  
9 and things --

10 MEMBER DENNING: I'm sure we are going to  
11 come back to this issue. So why don't you go ahead --

12 MEMBER-AT-LARGE SIEBER: It won't go away.

13 MR. WOLFGANG: Okay, moving to the next  
14 slide, more purposes of issuing a generic letter,  
15 respond to the Agency's need to provide clarification  
16 and closure of outstanding fire protection issues,  
17 respond to the licensee's request to provide  
18 clarification of regulatory expectations, and respond  
19 to the region's request to provide clarification of  
20 regulatory expectations for circuit inspections. And  
21 circuit inspections were resumed January 2005.

22 Generic letter, what information it is  
23 requesting from the licensees. Within 90 days to  
24 evaluate their licensing basis and information in the  
25 generic letter regarding multiple spurious actuations

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1 in the Post-Fire Safe-Shutdown Circuit Analysis.

2 MEMBER MAYNARD: Is that practical to  
3 expect -- I think we might get into a little bit more  
4 as to what we are really asking here but within 90  
5 days, for the whole industry to do this, I'm sure  
6 there is going to be some resources -- external  
7 resources needed in some cases.

8 With the whole industry trying to use  
9 those, is 90 days really a practical time frame to get  
10 what is really being asked for here?

11 CHAIRMAN WALLIS: Well, we believe that it  
12 is. But, you know, I guess when NEI talks, they have  
13 a consensus from the industry that it is not a  
14 sufficient time, We can always adjust that.

15 MR. WOLFGANG: Yes, I think what is being  
16 asked here is not for the technical evaluation of the  
17 entire circuit analysis. What we are asking for is  
18 for licensees to report whether they have a multiple  
19 spurious licensing basis or they have a single  
20 spurious licensing basis.

21 For those plants that have a multiple  
22 spurious and haven't analyzed for multiple spurious,  
23 then that is going to be a long-term fix. All we are  
24 asking them to do is to report their situation within  
25 90 days, which is a licensing --

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1                   MEMBER DENNING: Wait a second. How do  
2 they submit their functionality assessment of effected  
3 SSCs without doing that total analysis? Am I missing  
4 something here? And this is within 90 days, if  
5 you're not in compliance, you have to submit this  
6 functionality assessment of effected SSCs.

7                   MEMBER APOSTOLAKIS: And compensatory  
8 measures.

9                   MEMBER DENNING: And compensatory  
10 measures. I think that is the whole analysis, isn't  
11 it? I mean you don't necessarily know how you are  
12 going to ultimately correct them but it seems to me  
13 that the analysis has to be done in 90 days.

14                   Incidentally, I should have mentioned that  
15 listening in is EPM, which is a company that does this  
16 kind of stuff. But I should have mentioned that  
17 earlier that we do have an open line here.

18                   I'm sorry, go ahead.

19                   MR. WOLFGANG: Yes, what we are asking --  
20 yes, to submit the functionality assessment of  
21 effected SSCs.

22                   MEMBER DENNING: Yes. How do you  
23 determine what SSCs are effected unless you have  
24 looked at the multiple spurious actuations.

25                   MR. WOLFGANG: Yes, they have to look at

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1 the multiple spurious actuations.

2 MR. FRUMKIN: First, I agree with the  
3 member that doing a full analysis for 104 plants in 90  
4 days is not going to be credible. This is a major  
5 effort to look at that.

6 I believe though that the second bullet of  
7 compensatory measures for these areas where the plants  
8 are capable of putting compensatory measures and then  
9 solving the problems in a long-term program. That is  
10 credible. That is possible.

11 MEMBER APOSTOLAKIS: It seems to me that  
12 the 90 days applies to the first bullet but not the  
13 sub bullets.

14 MEMBER MAYNARD: I think it does a -- it  
15 certainly applies to the first bullet.

16 MEMBER DENNING: But the sub bullets are  
17 there in the generic letter.

18 CHAIRMAN WALLIS: Well, why is there an  
19 assumption that they are not in compliance now? I  
20 mean that they have done various things today to meet  
21 the regulations already. And their position would  
22 probably be we are in compliance now. So what are you  
23 asking us to do?

24 MEMBER DENNING: No, I don't think so.

25 MEMBER-AT-LARGE SIEBER: Well, if you took

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1 the lag out of your plant --

2 CHAIRMAN WALLIS: That's the problem.  
3 They have changed something.

4 MEMBER-AT-LARGE SIEBER: You changed the  
5 configuration.

6 CHAIRMAN WALLIS: That is okay. So they  
7 have changed something. Thank you.

8 MEMBER DENNING: It is not just that,  
9 Graham. They have argued that this has not been the  
10 requirement. That you didn't have to do multiple  
11 spurious actuations. They did one at a time or a  
12 single. So they would argue this is not the  
13 regulatory -- they would argue that it is new  
14 requirement but kind of like Otto has.

15 MEMBER KRESS: But the regulation says  
16 broadly that under these conditions, you have to have  
17 one train of safe shutdown. And that can only be  
18 interpreted as multiple spurious actuation I think.

19 MEMBER MAYNARD: I don't think -- I don't  
20 agree with that. Through the regulatory process, you  
21 don't necessarily have to assume everything that  
22 anybody could ever conceivably come up with. And so  
23 that's why the NRC and the industry -- but you decide  
24 on a set of assumptions. And what you really have to  
25 assume to reasonably meet that requirement.

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1           And then as new information comes along,  
2           if those previous assumptions weren't conservative  
3           enough, you may need to do that. But that really  
4           constitutes a change there. Otherwise why would you  
5           have any guidance documents or any -- what is allowed  
6           to assume or whatever. So I would argue that it is  
7           part of it.

8           MEMBER DENNING: In some respect, this is  
9           an open-ended problem in terms of, you know, and so it  
10          begs for some kind of guidance as to where you end the  
11          search for things that can go wrong.

12          Continue.

13          MR. WOLFGANG: We are asking that within  
14          six months to submit the plan to return all effected  
15          SSCs to compliance with the regulatory requirements.  
16          And that is the plant modifications, license .  
17          Exemption request.

18          And we are also asking that within 30  
19          days, if you cannot meet the 90-day, six month  
20          schedule that we are requesting, you provide us  
21          notification you cannot meet it and your suggested  
22          schedule and completion date.

23          CHAIRMAN WALLIS: What kind of things  
24          would they do to come into compliance? Are they going  
25          to change these offending cables? Are they going to

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1 change the way in which they put out fires? Are they  
2 going to change the actual equipment in the SSC? It  
3 is very open ended what they are expected to do.

4 MR. WOLFGANG: Yes, they can protect  
5 cables. They can reroute cables. They can submit  
6 license amendments based on a risk analysis method --  
7 those type of things.

8 CHAIRMAN WALLIS: Manual actions?

9 MR. WOLFGANG: Well, not in 3(g)(ii)  
10 space. There are a lot of ways.

11 MEMBER DENNING: I don't know how  
12 expensive those ways are. I mean we say there are  
13 lots of ways but those ways may be extremely  
14 expensive.

15 CHAIRMAN WALLIS: Well, I'm also unclear  
16 about what it is they are supposed to assume can go  
17 wrong? When I read these things about they are  
18 supposed to assume the possibility that this can  
19 happen, it goes back to Otto's question here.

20 I mean if you assume the very worst that  
21 could possibly happen, then you could have enormous  
22 changes in the plants in order to avoid this worst  
23 conceivable thing. Is that what you are asking them  
24 to do?

25 MR. WOLFGANG: You have to assume all

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1 multiple spurious actuations.

2 CHAIRMAN WALLIS: Well, but that is a  
3 major thing, isn't it?

4 MEMBER MAYNARD: That is major.

5 CHAIRMAN WALLIS: You have to assume that  
6 it happens with the probability of one?

7 MR. WOLFGANG: Yes.

8 MEMBER-AT-LARGE SIEBER: Yes. On the  
9 other hand --

10 MR. WOLFGANG: 3(g)(ii) in deterministic  
11 space doesn't limit the number of --

12 MEMBER-AT-LARGE SIEBER: On the other  
13 hand, you restrict the fire to a single fire area,  
14 which means that if you have appropriate separation or  
15 fire barriers that you have a train that is free of  
16 fire, that will operate.

17 MR. WOLFGANG: Right.

18 MEMBER-AT-LARGE SIEBER: And that is the  
19 principle. I think it is going to vary dramatically  
20 from plant to plant, especially based on the age of  
21 the plant and the type of plant. I think some are  
22 going to be tremendously impacted. Some others may  
23 not. And again, depending on what assumptions you  
24 really have to make and what credit you can take for  
25 things you already have in place, things that have

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1 already been done, everything from operator actions to  
2 fire loadings, improvement in fire control,  
3 everything.

4 MEMBER DENNING: And, Jack, you talked  
5 about the separating of trains. And that's, you know,  
6 pretty straight forward. But isn't the real open  
7 endedness related to the spurious actuations where  
8 there is some unanticipated valve opens that effective  
9 give you a loss of coolant accident or something like  
10 that, that, you know, introduces a different element  
11 to safe shutdown. Isn't that the open-endedness that  
12 makes it so difficult.

13 And I also don't know whether -- how many  
14 plants really know what cables are in what trays  
15 within a room.

16 Obviously if you are going to do -- yes so  
17 that you basically are assuming anything within the  
18 room -- I mean you know that -- you have concluded  
19 that it has gone through a room up to this point.  
20 But, you know, they could be in totally different  
21 trays in the room. But you don't know where they are  
22 in the room.

23 CHAIRMAN WALLIS: Well, you have to assume  
24 that they are all together and they are all --

25 MEMBER DENNING: Assume that you have to

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1 submit it. But I don't know the answer to that.

2 MEMBER KRESS: Assume that you have to do  
3 it. But I don't know the answer to that.

4 MR. WOLFGANG: Well in a fire area in a  
5 room, if you assume a fire, you have to assume  
6 everything is --

7 MEMBER KRESS: Yes, but can everything  
8 have an inter --

9 CHAIRMAN WALLIS: Everything in that room  
10 can short together?

11 MEMBER KRESS: -- can it short together as  
12 an inter-cable connection even though it may be way  
13 separated?

14 MR. FRUMKIN: No, if it couldn't occur,  
15 then it wouldn't be -- I mean you wouldn't have -- we  
16 wouldn't be expecting energized cables to penetrate  
17 conduits. We wouldn't expect energized cables to jump  
18 from tray to tray.

19 Or, for example, DC current has to have  
20 the same path. If it is not in the same tray or same  
21 conduit you couldn't actuate that from an AC circuit  
22 or something of that nature.

23 MEMBER DENNING: I don't know whether --  
24 what utilities know what cables --

25 MR. FRUMKIN: Right, no, you are correct.

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1                   MEMBER DENNING: -- are in what trays you  
2 were going to run.

3                   MR. FRUMKIN: And that can be a very  
4 significant effort.

5                   One of the aspects is that for the  
6 3(g)(ii) area -- or for the 3(g)(iii) plants, some of  
7 the older plants are 3(g)(iii). And they don't have  
8 very much separation at all. But they have done a  
9 significant analysis that was reviewed in the 80s  
10 which we referred to earlier. And they do have the --  
11 because they have done that detailed analysis, they  
12 have the flexibility to do manual actions.

13                   So in effect, the newer plants with the  
14 good separation should be fairly well off. The older  
15 plants that had very little separation probably have  
16 done a lot of this analysis already and may already be  
17 in compliance.

18                   It is the middle plants that are more  
19 likely than the older plants to have the circuits  
20 traced. But they are kind of in the middle there.  
21 And they are the ones who I think are going to be  
22 having a more difficult time answering this generic  
23 letter.

24                   MEMBER-AT-LARGE SIEBER: That is a pretty  
25 limited number of plants then. This issue is, you

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1 know, I was a young man when this issue came out. The  
2 work has been done. And the plants that were built in  
3 the 80s, to my knowledge they all had pull tickets  
4 associated with cables when they were originally  
5 routed.

6 So you just run your computer and it tells  
7 you whether you've got separation or not. And if you  
8 don't, what circuits are offending circuits.

9 MR. FRUMKIN: Many plants have that. Or  
10 some plants have that.

11 MEMBER-AT-LARGE SIEBER: Some plants have  
12 it. Some plants had to do that all manually, hand  
13 over hand.

14 MR. FRUMKIN: But I just want to add one  
15 thing that the staff has come our with a statement --  
16 or, well, not really a statement but what 3(g)(ii)  
17 says is that when cables of the redundant trays are  
18 within the same fire area and are not protected, so if  
19 you have a area with train A equipment in it and no  
20 train B equipment or the train B is protected in  
21 accordance with 3(g)(iii) protection criteria, we're  
22 not -- so with the train B protected, we're not  
23 limiting the actions that -- the feasible and reliable  
24 actions for failures on train A.

25 So if you have a protected train outside

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1 of a fire area or protected with 3(g)(ii), the  
2 licensees can do feasible and reliable manual actions  
3 on the fire-effected train to let's say close that  
4 valve that opens spuriously or stop that pump that  
5 opens spuriously because there is a full -- typically  
6 from the control room, so there is good annunciation  
7 and indication, there is a full protected train  
8 outside of that fire-effected area.

9 And I'll just point to Alex and see if he  
10 nods at me. Okay, yes.

11 MEMBER-AT-LARGE SIEBER: And there is very  
12 limited amounts of equipment if you had a spurious  
13 actuation, would cause another accident like a LOCA.  
14 Some value opens in the valve is -- like a safety  
15 injection valve, is designed to pump in not pump out.

16 Okay, so there are check valves and things  
17 like that that would prevent that. But there area  
18 few cases -- PRVs for example --

19 MR. FRUMKIN: Yes, PRVs is one I was  
20 thinking of if you --

21 MEMBER-AT-LARGE SIEBER: Yes , that could  
22 open and --

23 CHAIRMAN WALLIS: New plant designs have  
24 this screw valves. And the spurious actuation of them  
25 create a LOCA.

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1 MEMBER-AT-LARGE SIEBER: Yes, but they  
2 have them so you get to a safer condition, right?

3 CHAIRMAN WALLIS: One question I was going  
4 to --

5 MEMBER-AT-LARGE SIEBER: It is just  
6 expensive to do it.

7 MEMBER DENNING: Yes, is there any kind of  
8 assessment as to what fraction of spurious actuations  
9 actually are deleterious as far as effecting safe  
10 shutdown capability? I mean has anybody in a risk  
11 study done that kind of an assessment? Or do you have  
12 any feeling as to the fraction of spurious actuations  
13 that will get you into trouble?

14 MR. FRUMKIN: Well, you asked for that.  
15 We have this bounding analysis that we did and you  
16 actually -- well, you have to look at a lot to find  
17 the ones that are going to give you problems from a  
18 spurious actuation standpoint. But in our bounding  
19 analysis, it took five pairs of spurious actuations in  
20 order to get a significant risk.

21 And it is because these spurious system --  
22 these multiple spurious effect systems that, you know,  
23 are the redundant train. So it effects both -- the  
24 train, the productive train or the unprotected train,  
25 and the redundant train so you really lose all your

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1 protection with these scenarios. And it doesn't --  
2 you have to look at a lot to find the bad players.  
3 And there don't actually have to be a lot of bad  
4 players, at least based on our bounding analysis for  
5 it to be of fairly high risk significance.

6 MEMBER DENNING: Continue please.

7 MR. WOLFGANG: Background since 1997,  
8 multiple LERs brought lack of consensus concerning  
9 circuits to the staff's attention. And this led to a  
10 moratorium on inspection of circuit issues back in  
11 1997.

12 In 2001, NEI/EPRI cable fire test  
13 demonstrated that multiple spurious actuations can  
14 occur. And they can occur in rapid succession or  
15 simultaneously without sufficient time for mitigation  
16 in between.

17 Therefore if a licensee doesn't account  
18 for multiple spurious actuations, and its circuits  
19 analysis, the licensee may not be in compliance with  
20 10 CFR 50.48 and 10 CFR Part 50, Appendix A, General  
21 Design Criteria, and (3) which require that a licensee  
22 provide and maintain free from fire damage, one train  
23 of systems necessary to achieve and maintain the safe  
24 shutdown.

25 Staff has developed the risk-informed

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1 approach to inspections to focus on risk-significant  
2 configurations based on the cable fire test. And this  
3 is RIS 2004-003.

4 MEMBER DENNING: Now let me ask with  
5 regard to that, I understand that that was prepared  
6 for inspection as opposed to compliance.

7 MR. WOLFGANG: Correct.

8 MEMBER DENNING: But is there a real  
9 reason why one couldn't use guidance of that type for  
10 compliance as well? Do you see a regulatory  
11 constraint that would prevent you from -- I mean from  
12 the regulations that exist now, do you think it would  
13 be incompatible for the staff to provide the  
14 equivalent, perhaps a perturbation off of that or  
15 perhaps a revision to NEI's risk-informed guidance?  
16 Why can't we do that?

17 MR. WOLFGANG: I think the thing is we  
18 haven't seen licensee's risk tools, their model that  
19 we would have to approve prior to them using any risk  
20 analysis.

21 MR. KLEIN: Let me take a shot at  
22 answering the question maybe at a higher level. And  
23 that is with respect to licensees who are required to  
24 meet the requirements of Appendix R. Don't today have  
25 the ability to change that regulation or the

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1 commitment to that regulation based upon risk  
2 information.

3 If they want to do that, they would have  
4 to seek an exemption request from us against the  
5 regulation. They may certainly use risk information if  
6 they want to come in and see us with an exemption  
7 request, that is certainly open to them.

8 But what I think Bob is indicating is that  
9 a licensee may not make a change in their plant using  
10 risk information and making the conclusion based upon  
11 their standard license condition that says that, you  
12 know, it doesn't effect their ability to achieve and  
13 maintain safe shutdown.

14 The staff has been telling licensees that  
15 we would like them to come in and see us for such an  
16 exemption request or a license amendment.

17 MEMBER DENNING: Yes, I understand that  
18 that is the way -- that is the process by which they  
19 would use risk information to do that. But this first  
20 bullet is generic. It is generic information as to  
21 how many combinations of things or what are kinds of  
22 situations that are -- could be expected to be risk  
23 significant?

24 Now I realize it is not totally complete  
25 but it, you know, it gave guidance to the inspectors

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1 as to what are the combinations of things that could  
2 risk significant to look at and make sure. And I  
3 don't see any reason why one couldn't effectively rule  
4 out some of this total space of situations that the  
5 applicant has to look at to be compliant.

6 Now, you know, Tom is saying -- and I  
7 think it is kind of the regulatory position that  
8 you've got to look at everything because anything that  
9 can prevent this safe shutdown pathway is a potential  
10 problem. But you used it for the inspector to give  
11 him guidance on what is risk important and not in the  
12 area.

13 Couldn't you have done the same to provide  
14 generic guidance on this is how far you have to go in  
15 this process of looking at multiple spurious  
16 actuations.

17 MR. FRUMKIN: Bob, let me -- I'll be  
18 candid. We tried very hard to read 3(g)(ii) as a --  
19 to be risk informed in the way you describe. And with  
20 help from our lawyers, we were unable to get there for  
21 those pre-`79 plants. And then there is also the  
22 Agency or the Commission has approved a risk-informed  
23 rule.

24 And although it is more comprehensive,  
25 that is out there. And we considered the possibility

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1 of a risk-informed changed to this rule, to the  
2 current 3(g)(ii), and there is currently a rule that  
3 has been promulgated by the Commission. So that did  
4 not seem like a credible approach.

5 CHAIRMAN WALLIS: Well, could I follow up  
6 on that? And I looked at this risk informed approach.  
7 It seems to be just advice on vendors --

8 MR. FRUMKIN: Yes?

9 CHAIRMAN WALLIS: -- to focus on certain  
10 configurations. Well, that's okay. Focus on what  
11 matters. But then how does this inspector decide to  
12 reach some sort of a finding that something is not  
13 adequate? Or is not in compliance. That would get  
14 closer to tying these things together because the  
15 whole question here is what do they have to do in  
16 order to be in compliance.

17 MR. FRUMKIN: That is correct.

18 CHAIRMAN WALLIS: And how does the  
19 inspector know when they are in compliance or not?  
20 Well, he has just chose to focus on these things. How  
21 does he then decide when he is focused whether or not  
22 they are in compliance?

23 MR. FRUMKIN: And the answer to that is  
24 they pull up the licensing basis and if the licensing  
25 basis, if they do not have -- are not licensed for

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1 single spurious, that are considered to be -- required  
2 to look for multiple spurious.

3 CHAIRMAN WALLIS: Well then what are they  
4 supposed to do?

5 MR. FRUMKIN: Then that would be -- that  
6 could be -- that would be a finding would be run  
7 through the risk analysis of this STP. It would be  
8 cited. And the licensee would have to resolve a  
9 finding in the normal manner.

10 MEMBER DENNING: Incidentally, I think  
11 your last statement about their legal interpretation  
12 of pre-`79 is very important as far as our  
13 considerations are concerned because I mean it could  
14 be indeed that we are in a box in terms of whether you  
15 can risk inform the current regulation or whether you  
16 would need to change a rule which is obviously a huge  
17 undertaking.

18 CHAIRMAN WALLIS: Well, I'm really  
19 wondering, you made an initial statement that we  
20 should have had a subcommittee meeting. We seem to be  
21 at the level of behaving like a subcommittee so trying  
22 to determine whether or not you are ready to go to the  
23 full Committee because there seems to be so many  
24 questions here. And yet we are here as a full  
25 Committee.

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1                   MEMBER DENNING: That is why we have three  
2 whole hours.

3                   CHAIRMAN WALLIS: You know subcommittees  
4 sometimes have the option of saying you guys aren't  
5 ready. You shouldn't go to the full Committee. But  
6 they are here.

7                   MEMBER DENNING: The full Committee has  
8 that same option, doesn't it?

9                   MR. WOLFGANG: To continue, in 2004, staff  
10 held a public meeting in Atlanta to discuss the staff  
11 positions and solicit stakeholder feedback. We worked  
12 with NEI to finalize an acceptable industry guidance  
13 document for circuit analysis. And that was NEI 0001.

14                   Staff issued RIS 2005-30 to clarify  
15 regulatory requirements for a circuit analysis. And  
16 that RIS addressed the terms associated circuits, any  
17 and all, and emergency control stations.

18                   And this draft generic letter was issued  
19 for public comment in October 2005. We held a public  
20 meeting in March of this year. And the pertinent  
21 public comments were incorporated into the final draft  
22 of the generic letter. And we also received CRGR  
23 approval to issue the generic letter.

24                   The basis for the generic letter -- the  
25 bulleted review of NRC regulations, generic

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1 communications, correspondence related to this issue.  
2 And we have references identified in the generic  
3 letter. The results of the 2001 NEI EPRI cable fire  
4 test program, prior to the cable fire test, there was  
5 very little information available regarding circuit  
6 failure during a fire which made enforcement of the  
7 regulations in this area difficult. And also input  
8 from inspectors on issues that needed to be addressed.

9 The issue clarified in the generic letter  
10 is multiple spurious actuations. As Dan said earlier,  
11 some licensees claim that only a single spurious  
12 actuation had to be assumed in their circuit analysis.  
13 This was based on a misinterpretation of Generic  
14 Letter 86-10 in response to question 5.3.10.

15 And also some licensees claimed multiple  
16 spurious actuation occur with sufficient time in  
17 between them to take mitigating actions.

18 CHAIRMAN WALLIS: Now this  
19 misinterpretation has been going on for how long?  
20 D.L. 86 is 9/86?

21 MR. WOLFGANG: Yes.

22 CHAIRMAN WALLIS: Over 20 years they have  
23 been under some misapprehension about the regulations?

24 MR. WOLFGANG: That is my understanding.

25 MR. FRUMKIN: In this section of the

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1 generic letter, it refers to the 3(g)(iii) associated  
2 circuits I believe. So it took 3(g)(iii) alternate  
3 shutdown -- I'm sorry -- it took this 3(g)(iii)  
4 assumption and applied it to 3(g)(ii) areas. And that  
5 is what this misinterpretation is describing.

6 MEMBER APOSTOLAKIS: Let me understand it  
7 a little bit the second bullet here. Suppose there is  
8 sufficient time between actuations? Okay, so you have  
9 the first one. You really don't know what the second  
10 one is going to be, right? It could be anything.

11 MR. WOLFGANG: Second.

12 MEMBER APOSTOLAKIS: Oh, let's say there  
13 are two --

14 MR. WOLFGANG: Actuations?

15 MEMBER APOSTOLAKIS: -- spurious -- yes.

16 MR. WOLFGANG: Yes, based on these tests,  
17 they could occur --

18 MEMBER APOSTOLAKIS: No, I understand  
19 that, that it is a very short time.

20 MR. WOLFGANG: Right.

21 MEMBER APOSTOLAKIS: But let's assume for  
22 a moment that there is sufficient time, there is long  
23 time between them.

24 MEMBER DENNING: And there may be, George.  
25 There is a contention that --

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1 MEMBER APOSTOLAKIS: Okay.

2 MEMBER DENNING: Yes, right.

3 MEMBER APOSTOLAKIS: But you still don't  
4 know what the second one is going to be.

5 MEMBER DENNING: Is going to be, right.

6 MEMBER APOSTOLAKIS: So you can really  
7 take mitigations actions without know what the second  
8 will be?

9 MEMBER DENNING: Well, now wait a second.  
10 If you have mitigated the first one --

11 MEMBER APOSTOLAKIS: Yes.

12 MEMBER DENNING: -- then it is as if you  
13 now just have one.

14 MEMBER APOSTOLAKIS: Oh, so now you are  
15 going to get together and wait.

16 MR. WOLFGANG: And when the second one  
17 occurs and you have time to mitigate that one.

18 MEMBER APOSTOLAKIS: And this is doable?  
19 I mean has anybody looked into the details of this?  
20 It comes back to this issue of open endedness. You  
21 really don't know what is going to happen next. So I  
22 don't understand this particular -- I mean have they  
23 submitted details, you know, if you have sufficient  
24 time, you will protect the plant?

25 MEMBER DENNING: You know what I think

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1 would help us is we had some better feeling as to how  
2 do they really mitigate these actuations?

3 MEMBER APOSTOLAKIS: Yes, exactly,  
4 exactly.

5 MEMBER DENNING: What is a typical -- and  
6 I know there are constraints on manual --

7 MR. WOLFGANG: Yes, in 3(g)(ii), they  
8 can't use manual actions.

9 MR. KLEIN: Licensees have commonly used  
10 operator manual actions to mitigate that spurious  
11 actuation. They may send an operator out in a plant  
12 to close a valve or some such action like that. And  
13 then they wait for the next actuation and they say,  
14 okay, I've got plenty of time available to have taken  
15 that first action. And now they wait for the second  
16 action. And when that occurs, they send the operator  
17 out.

18 So I think that second bullet there is to  
19 just simply indicate to the Committee that that is the  
20 claim that some licensees have made. That is not  
21 necessarily a position that the staff agrees with.

22 MEMBER APOSTOLAKIS: No, I understand  
23 that.

24 MR. WOLFGANG: Yes.

25 MEMBER APOSTOLAKIS: But I'm trying to

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1 understand the position.

2 MEMBER DENNING: Now suppose you had --  
3 suppose it takes 30 minutes to have them get out there  
4 and close the valve, now obviously -- more than, you  
5 know, and then something else happens say before he  
6 closes that valve, then the real question is there a  
7 compounding effect?

8 MR. WOLFGANG: And I guess like --

9 MEMBER DENNING: As far as you don't have  
10 enough operators that you can send out to do all these  
11 --

12 MEMBER APOSTOLAKIS: The real question is  
13 is the length of time the critical variable here. And  
14 it doesn't seem to me to be.

15 MR. FRUMKIN: I mean we'll give you an  
16 example, for example if you have a -- you going to  
17 drain two valves in series that would drain the RWST  
18 and you also damage a number of other equipment. They  
19 fail. They short out and become unavailable.

20 Well, if you have -- if you lose the  
21 indication on the RWST and you open up the valve and  
22 you say you have plenty of time to -- you have  
23 indication the valve opened spuriously, you can go  
24 down and close the valve and then when the next valve  
25 opens, it has no effect.

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1 I think that would be an example of where  
2 they feel they would have sufficient time. Let's say  
3 the circuits are in cable trays -- you know, 20, you  
4 know, six cable trays above. There is going to be a  
5 good deal of time before the first cable tray is  
6 damaged and the next -- the first cable is damaged and  
7 then the next cable.

8 So -- and from a risk standpoint, you  
9 might be able to argue yes, we will have adequate  
10 indication that the valve opened and we have adequate  
11 time. And then that could be a risk-informed type  
12 analysis.

13 But if they are in the same cable, then  
14 they both could open simultaneously.

15 MEMBER MAYNARD: If there is time and  
16 there are a number of things they can do, when you  
17 have a fire in an area, you typically know what cables  
18 and what other things could be potentially effected in  
19 that and the manual actions going out either manually  
20 isolating valves, pulling breakers, a number of things  
21 you can do. But it is based on what is in that area  
22 or what could be effected with those in that area.

23 MEMBER APOSTOLAKIS: I remember when I was  
24 reading the analysis of the Browns Ferry fire a long  
25 time ago. They did have spurious actuations there did

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1 they not?

2 MR. WOLFGANG: Yes.

3 MEMBER APOSTOLAKIS: Within 20 minutes I  
4 believe they had all sorts of signals and so on. And  
5 then things started going dead. How does that  
6 experience fit into this?

7 MR. FRUMKIN: I think that experience is  
8 "the long-held staff position" that multiple  
9 simultaneous spurious actuations occur. I think when  
10 you want to point your finger to where we come up with  
11 that, it comes from 1975. It comes from the very  
12 beginning of fire protection regulation is that these  
13 spurious actuations occur.

14 And I think that -- unfortunately the  
15 statements of consideration for Appendix R are short.  
16 You know we have, you know, dozens of pages for a  
17 short NFPA-805 and there may be a dozen pages and a  
18 page maximum for 3(g)(iii) -- for 3(g) of Appendix R.  
19 So we really can't go back in time and pull out the  
20 basis for that. But we have Mark Sallies here, he  
21 might be able to shed some light on that.

22 But I believe that that is the long-held  
23 staff position is the Appendix R fire and these  
24 multiple spurious and rapid succession starting pumps  
25 giving incorrect indication, doing all sorts of

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1 unpleasant things to the plant.

2 CHAIRMAN WALLIS: The incorrect indication  
3 is a big problem. Something has happened and yet you  
4 don't know quite what has happened. That is another  
5 variable altogether from the time. I mean it is the  
6 uncertainty of knowing what is going on which might  
7 lead the operator to do the wrong thing.

8 MEMBER-AT-LARGE SIEBER: Yes, on the other  
9 hand, indications usually either go full scale or to  
10 zero.

11 MEMBER MAYNARD: A lot of times you've got  
12 multiple indications. And that is something they are  
13 trained on quite a bit is on instrument failures.  
14 That said, it is not uncommon to have an instrument  
15 failure without a fire. So they are trained on how to  
16 handle that.

17 MR. FRUMKIN: Right. One of the failure  
18 though they can also get -- and, again, there's  
19 multiple indications, but they could get an indication  
20 of a pump starting when it didn't start. Or a pump in  
21 a start and stop position and then that's going to  
22 take time for them to troubleshoot and whether it was  
23 started or stopped could it be adversely effecting  
24 overfilling the plant or not.

25 There are a number of timing issues that

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1 I'm sure they are trained on. But they can be  
2 potentially challenging.

3 MEMBER DENNING: Continue.

4 MR. WOLFGANG: The NRC letter from Sam  
5 Collins to NEI in 1997 stated that multiple spurious  
6 actuations caused by fire-induced hot shorts must be  
7 considered and evaluated. As I stated earlier, Byron  
8 and Braidwood have SCRs approving the assumption of a  
9 single spurious actuation for a fire event. So if the  
10 staff position is applied to them, it would be  
11 considered compliance backfit.

12 The generic letter --

13 MEMBER-AT-LARGE SIEBER: That's a unique  
14 case, those two plants.

15 MR. WOLFGANG: Yes, correct. The generic  
16 --

17 MEMBER APOSTOLAKIS: But what does that  
18 mean now?

19 MR. WOLFGANG: They are in compliance by  
20 definition.

21 MEMBER APOSTOLAKIS: You would say the SCR  
22 was not correct or what?

23 MR. WOLFGANG: They are in compliance by  
24 definition, right.

25 MEMBER APOSTOLAKIS: But I don't

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1 understand this compliance backfit.

2 CHAIRMAN WALLIS: Compliance by mistake is  
3 what I heard earlier.

4 MR. WOLFGANG: Well, by regulatory  
5 approval.

6 MEMBER APOSTOLAKIS: Can you explain the  
7 parenthesis? If stop position is applied to them, it  
8 would be a compliance backfit. You mean the current  
9 position?

10 MR. WOLFGANG: If they comply with their  
11 SER, the SER is approved even though it was a mistake,  
12 it would be a compliance backfit if we made them  
13 change.

14 MEMBER APOSTOLAKIS: So you would have to  
15 admit then that the SER was not correct?

16 MR. WOLFGANG: We have already admitted  
17 that.

18 MEMBER APOSTOLAKIS: Okay.

19 MEMBER MAYNARD: It is a matter of what  
20 regulatory process is used to actually do it. A lot  
21 fo people think backfit is a bad thing. I think it is  
22 a process that should be used a little bit more rather  
23 than trying to go around a lot of these things. Just  
24 say hey look, we've changed or this is a new  
25 requirement. Here's the regulatory burden. Here is

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1 the increased safety benefit. We are imposing this as  
2 the new requirement for you. It's not necessarily a  
3 bad thing. Just what regulatory burden --

4 MEMBER APOSTOLAKIS: But this doesn't  
5 happen too often, right? I mean --

6 MEMBER DENNING: What? Regulatory  
7 mistakes?

8 MEMBER APOSTOLAKIS: Yes.

9 MEMBER DENNING: Right.

10 CHAIRMAN WALLIS: Well, this last bullet,  
11 I have a lot of problem with. And they must be  
12 considered and evaluated. But it seemed to be very  
13 unclear about to what depth and by what methods these  
14 things must be considered and evaluated. That seems  
15 to be so open-ended that the licensee must be  
16 uncertain what he has to do.

17 MEMBER DENNING: RIS provides more detail  
18 than the generic letter does, right. The 2005 RIS.

19 MR. WOLFGANG: 2005-30?

20 MEMBER DENNING: Yes.

21 MR. WOLFGANG: Not on multiple spurious  
22 actuations, no.

23 MEMBER DENNING: No?

24 MR. WOLFGANG: It doesn't address that.

25 We didn't put that in there because we thought

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1 multiple spurious actuations because of this Byron and  
2 Braidwood SCR could be considered possibly a change in  
3 staff position. So that's why we didn't want to put  
4 it in a RIS.

5 CHAIRMAN WALLIS: There is no regulatory  
6 guide that says how to evaluate multiple spurious  
7 actuations?

8 MR. KLEIN: I think if I could respond to  
9 that question, I'll ask Dan also to pipe in. Is on  
10 page 7 of the generic letter where we do talk about,  
11 you know, ways that licensees can bring themselves  
12 into compliance, there is a discussion in there about  
13 the deterministic methodology or NEI-0001.

14 We do talk about the guidance in there in  
15 Chapter 3. We do say that for post-fire safe-shutdown  
16 circuits in conjunction with the guidance provided in  
17 this generic letter that NEI-0001 is one of the  
18 acceptable approaches to achieve regulatory compliance  
19 with the fire protection requirements for multiple  
20 spurious actuations.

21 So that's one example. And Dan can  
22 correct me if I've overstated this.

23 MR. WOLFGANG: And we say in conjunction  
24 with the guidance provided in this generic letter to  
25 mean consider multiple spurious actuation. I believe

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1 NEI-0001 says to consider two spurious actuations.

2 CHAIRMAN WALLIS: That doesn't mean  
3 anything to me. It could simply mean to say well I  
4 considered it and I think it is irrelevant or  
5 something. I mean what does consider mean? But what  
6 depth? By what methods?

7 MEMBER APOSTOLAKIS: To the depth required  
8 to convince the staff.

9 MEMBER BONACA: That is called open ended.  
10 We could fix it here but it seems to me that, you  
11 know, we do have a problem. And we are trying to  
12 figure out what is the best regulatory process to  
13 solve it. But the problem is there.

14 CHAIRMAN WALLIS: Well, I think we agree  
15 there is a problem. It is just whether or not there  
16 is a mature enough process in place to make something  
17 that is workable happen.

18 MEMBER BONACA: I understand.

19 MEMBER-AT-LARGE SIEBER: Well, this work  
20 has already been done once. The only thing that  
21 changed is the disqualification of certain fire  
22 barriers. All the licensees have done this. And it  
23 should be part of their licensing basis. There should  
24 be plant records as to how they did it the first time.

25 MEMBER DENNING: Really, Jack? I mean

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1 isn't there an issue here of the number of licensees  
2 who thought that they were really dealing with one  
3 spurious actuation requirement? Or one at a time?

4 MEMBER-AT-LARGE SIEBER: I can only speak  
5 to one licensee or about one licensee. And that was  
6 not the assumption.

7 MEMBER DENNING: That was not your  
8 assumption.

9 MEMBER-AT-LARGE SIEBER: No.

10 MEMBER DENNING: No. But there are  
11 licensees out there --

12 MEMBER-AT-LARGE SIEBER: Otto, was that  
13 yours? It is sort of obvious from Browns Ferry that  
14 you get more than one.

15 MEMBER MAYNARD: I'm trying to recall  
16 because the only place where we had different trains  
17 mixing was in the control room so it was primarily a  
18 control room-related issue.

19 MEMBER KRESS: But that is one purpose of  
20 the generic letter to find out the status.

21 MEMBER-AT-LARGE SIEBER: The only time the  
22 number of faults becomes an issue is when you are  
23 trying to solve the problem with operator manual  
24 actions. So now you've got too many things for too  
25 few people to do.

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1           But if you have train separation and the  
2 train separation is effective, you are going to get  
3 some spurious actuations which are going to be  
4 upsetting but not fatal. And you are still going to  
5 maintain a full set of safety equipment that  
6 functions. And that is the object of the fire  
7 protection regulation.

8           MR. KLEIN: I would strongly agree with  
9 what Dr. Sieber just indicated in that the focus here  
10 is on 3(g)(ii) compliance and that is where you've got  
11 the redundant trains in the same fire area as Dan had  
12 indicated. And Dan had indicated some of the history  
13 that, you know, led us up to this.

14           And that had to do with the resolution  
15 that some licensees used to address the thermal lag  
16 issue where they removed some of these fire barriers  
17 and in lieu of meeting the separation requirements of  
18 3(g)(ii), elected to put in place the use of operator  
19 manual actions.

20           And I think that is a very important thing  
21 to kind of keep in mind.

22           MEMBER-AT-LARGE SIEBER: But other  
23 licensees pulled no cable.

24           MR. KLEIN: That is correct. I'm not --

25           MEMBER-AT-LARGE SIEBER: They moved

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1 circuits out of the same fire area.

2 MR. KLEIN: Yes, I'm not suggesting that  
3 all licensees implemented unapproved operator manual  
4 actions in lieu of the requirements of 3(g)(ii).

5 There are other licensees who did plant modifications,  
6 did re-analysis, did re-wraps, pulled cables, what  
7 have you to bring themselves back into compliance with  
8 3(g)(ii).

9 MEMBER-AT-LARGE SIEBER: And some of them  
10 didn't use thermal lag to begin with.

11 MR. KLEIN: That is correct.

12 CHAIRMAN WALLIS: Well, I don't really  
13 have a good understanding of what kind of spurious  
14 actions we are talking about, what kind of operator  
15 actions in response we're talking about, and whether  
16 redundant trains solve the spurious action problem.

17 If I have a fire scenario and it switches  
18 on my high pressure injection, I've got a pump that  
19 runs and it is pouring water into the system, right?  
20 For one thing, I have to know -- I have to diagnose  
21 what is happening. Do I have to send somebody  
22 somewhere to shut a valve? And does that factor have  
23 some redundant train help me at all when something has  
24 been activated spuriously? I mean it is not clear to  
25 me what the range of kind of scenarios is that you are

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1 talking about here.

2 And whether redundant trains always help  
3 you or don't. Maybe they don't help you at all  
4 sometimes. And maybe the operator action sometimes is  
5 so severe that it is very difficult to take.

6 MEMBER MAYNARD: I think in most cases,  
7 there are things they can do. But there are some --  
8 and I think the power operator relief valve is one  
9 that if you have a system where you can't operate the  
10 block valve or the PRE, if it opens you basically have  
11 given yourself a small break.

12 CHAIRMAN WALLIS: That's what I think.  
13 When you think about TMR, they had a false indication  
14 because there was a light which said it was closed  
15 when it was open.

16 MEMBER MAYNARD: But most times you are  
17 still covered by -- I mean you are still analyzed for  
18 a small break LOCA or for the other events. A pump  
19 coming on, there are multiple ways to turn pumps off.  
20 And you are not going to be injecting water at such a  
21 rate that you have, you know -- I'm kind of talking  
22 more PWR than I am BWN here so I --

23 MEMBER DENNING: But it is those things  
24 though -- it is the multiplicity of those things that  
25 boggles my mind. You know rather than train

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1 separation and train protection which you talked  
2 about, it just seems like there is such a multiplicity  
3 of potential things and trying to analyze all those  
4 things seems almost open ended.

5 MEMBER-AT-LARGE SIEBER: There aren't --  
6 in sheer numbers, there aren't all that many safety  
7 circuits. And if you go underneath the control room  
8 into the faucet rafter, you'll find loads of jumpers  
9 and knife switches and things like that where you can  
10 de-energize control circuits.

11 Now one of the problems is that it  
12 actually, in a lot of circuit breakers, it takes power  
13 to trip it, you know. The trip coil requires  
14 energization so pulling a knife switch doesn't  
15 guarantee that it will run forever. And so the  
16 operator really has to understand how the control  
17 system is set up to be able to do that.

18 But there are ways to overcome these  
19 problems that don't require excursions all over the  
20 plant. And on the other hand, the plant is designed  
21 to be safe provided that you have a functional safety  
22 train. Separation criteria, if rigidly applied,  
23 provides that independent safety train.

24 MEMBER DENNING: We are going to now take  
25 our break until 20 after 10. And then we will have to

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1 move surprisingly quickly after that.

2 CHAIRMAN WALLIS: Okay. So we're going to  
3 take a break until 20 past 10.

4 (Whereupon, the foregoing matter went off  
5 the record at 10:09 a.m. and went back on the record  
6 at 10:23 a.m.)

7 CHAIRMAN WALLIS: Rich, would you resume  
8 the management of the meeting, please?

9 MEMBER DENNING: Please proceed.

10 MR. WOLFGANG: Okay. The last issue,  
11 clarifying the generic letter, the point we have here  
12 is the staff position on multiple spurious actuations  
13 presented in the generic letter is consistent with  
14 section 9.5.1 of the standard review plan.

15 Public comments. The significant public  
16 comment was that the generic letter constituted a  
17 backfit to licensees. And we addressed this comment.  
18 We obtained CRGR approval to issue this generic  
19 letter. And, as I said earlier, only for Byron and  
20 Braidwood, who have approved SERs that we know of,  
21 would this constitute a backfit.

22 Basically, this generic letter is just a  
23 request for information.

24 MEMBER MAYNARD: I would challenge that.

25 MR. WOLFGANG: Yes. I think --

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1                   MEMBER MAYNARD: That's all right. We'll  
2 comment on that.

3                   CHAIRMAN WALLIS: It isn't just a request  
4 for information. It asks them to do a lot of things.

5                   MEMBER MAYNARD: Yes. That is what I  
6 challenge, that statement. Yes. We've talked about  
7 it.

8                   CHAIRMAN WALLIS: That was what I was  
9 uncertain about.

10                  MEMBER DENNING: Why don't you go ahead  
11 and summarize, even though we're going to have a  
12 couple of other things? Why don't you go ahead and  
13 summarize? Then there are a couple of other things we  
14 would like you to -- we have more than started. We're  
15 almost done.

16                  MR. WOLFGANG: A summary. The generic  
17 letter, as I said before, is a request for information  
18 from licensees. The industry cable fire test program  
19 reaffirmed the staff interpretation of the regulatory  
20 requirements concerning multiple spurious actuations  
21 must be considered in the circuits analysis. The  
22 generic letter is necessary to ensure that all  
23 risk-significant circuit situations are identified and  
24 addressed.

25                  CHAIRMAN WALLIS: Could you go back a bit

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1 and say something about why this came about? I mean,  
2 wasn't this something to do with this thermal lag  
3 business? All of these installations, like Hemmicks  
4 and Eastern, every time we look at them --

5 MR. WOLFGANG: Yes.

6 CHAIRMAN WALLIS: Well, isn't that the  
7 solution would be to have a proper barrier around  
8 these things?

9 MR. WOLFGANG: That's one solution, yes.

10 MEMBER DENNING: I don't see that as a  
11 total solution. I don't --

12 MR. WOLFGANG: That is one solution.  
13 Another solution is a separation, 20-foot separation.

14 CHAIRMAN WALLIS: But in the past, when we  
15 believed that this thermal lag worked, there wasn't a  
16 problem. Is that right?

17 MEMBER MAYNARD: No. I think the problem  
18 was still there then. This has been bounced around  
19 since I know at least the early '80s as an issue. I  
20 think the thermal lag, it helped in some cases where  
21 you could show separation in the trains, but it  
22 doesn't necessarily take care of you if you've got  
23 cables in the same area that are --

24 MEMBER DENNING: Right. They can still  
25 give you spurious actuation, regardless.

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1 MEMBER MAYNARD: Right.

2 MEMBER DENNING: Now, it may be -- do you  
3 have any comments on that?

4 MR. FRUMKIN: Yes. If you have the  
5 separation, you can still get spurious actuations.  
6 And that's a box that we're not in with the rule. The  
7 rule does not require that those be protected. So all  
8 plants have the flexibility for the unprotected train  
9 to mitigate through feasible and reliable manual  
10 actions those types of spurious actuations.

11 Now, if you were to get a spurious  
12 actuation that were to give you all incorrect  
13 indication and was not recoverable, then that would  
14 still have to be resolved because it would be a  
15 potential safety issue. But for the minor ones that  
16 we have been talking about that would be fairly easy  
17 to resolve through a manual operator action or there  
18 are procedural controls or something of that nature,  
19 that would not be a compliance issue per se.

20 MEMBER DENNING: Help me with that because  
21 I still don't quite understand it. So if you have a  
22 protected train and you get a spurious actuation from  
23 an unprotected train, then you have to analyze all  
24 combinations of spurious actuations still, don't you,  
25 that are possible in that unprotected train?

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1 MR. FRUMKIN: Alex, do you want to?

2 MR. KLEIN: Yes, I believe you do because  
3 the over-arching requirement of appendix R is to be  
4 able to safely bring your plant to safe shutdown. And  
5 if you don't know what's occurring in your plant, then  
6 you can't meet that over-arching high-level goal of  
7 achieving and maintaining safe shutdown of your plant.

8 MR. FRUMKIN: And I will just say that  
9 once you have your protective train, your protected  
10 train, your unprotected train has a very limited set  
11 of things that could hurt you.

12 Now, we're talking we have plenty of  
13 water. We have plenty of indication. We have plenty  
14 of everything. But now we might open, we might cause  
15 a drain letdown path to open or we might cause a pump  
16 to start, but we should be getting clear indication of  
17 that in the control room. And in the normal  
18 procedure, process, you'll be getting indication of  
19 these things happening. And they should be able to  
20 mitigate them fairly effectively.

21 Now, there may be some things that would  
22 be difficult to mitigate. And, as Alex says, they  
23 have to find those and find a way to mitigate them.

24 MEMBER DENNING: So you have lots of  
25 things you have to analyze, but the mitigation of it

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1 is probably not too severe for the plant, and the  
2 plant is allowed to do manual action on it.

3 Now, there is another set here. So what  
4 is the other set? Aren't you always required to have  
5 a protected train?

6 MR. FRUMKIN: Yes. And these plants don't  
7 have that protected train. In effect, all circuit and  
8 manual action findings or potential violations are  
9 lack of protection, lack of circuit protection.

10 MEMBER DENNING: Circuit separation.

11 MR. FRUMKIN: So when --

12 MEMBER DENNING: Separation of the --

13 MR. FRUMKIN: Right. So when a finding  
14 comes in, let's say we have that hypothetical finding,  
15 which opens up and drains down the RWST. The citation  
16 is going to be against 3G2, lack of separation and  
17 lack of protection.

18 Now, we don't require one protection  
19 method over another, but they didn't put a protection  
20 method in there to protect the -- well, RWST is a bad  
21 example because it is not a necessarily one-train  
22 system.

23 But let's say you have both trains being  
24 affected by a fire. And here this is probably what is  
25 the more likely scenario. One train is just going to

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1 be damaged by the fire and not work, and then the  
2 other train is going to have the spurious actuation.

3 We don't necessarily need both trains to  
4 have spurious actuations. So that's the situation.  
5 It doesn't have to be multiple spurious on multiple  
6 trains.

7 MEMBER APOSTOLAKIS: Have we agreed that  
8 the first bullet is not quite correct? We're asking  
9 for more than just information?

10 MR. FRUMKIN: It's clear.

11 MEMBER APOSTOLAKIS: Yes.

12 MEMBER DENNING: It just takes them a lot  
13 of work to do it. I think we all recognize that it's  
14 a request for information, but in order to produce  
15 that information, you have to do a lot of work.

16 MEMBER APOSTOLAKIS: Right. It sounds to  
17 me like the priest saying, you know, "I know you're a  
18 sinner, George. Now, you go away and think of all the  
19 ways in which you could be a sinner and come back and  
20 tell me what they are." I have thought about it.

21 CHAIRMAN WALLIS: It's already been  
22 analyzed.

23 MEMBER APOSTOLAKIS: I protected myself.

24 MEMBER DENNING: Let's go on. And I would  
25 like to hear the conservative risk analysis. And so

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1 would you give us a little presentation on the  
2 conservative risk analysis?

3 MR. FRUMKIN: Are you done with all of  
4 your slides?

5 MEMBER DENNING: Yes.

6 MR. WOLFGANG: Yes. I just want to say  
7 one thing. If we don't issue a generic letter, we'll  
8 have to use the inspection process behind these  
9 problems.

10 It will take longer. We estimate three  
11 triennials, nine years. And some risk-significant  
12 items may be missed. We don't know because the burden  
13 is put on us, instead of the licensee. I just want to  
14 bring it up.

15 MEMBER DENNING: Thank you.

16 MEMBER BONACA: Is it with regard to the  
17 90 days with the responses? I mean, how did you come  
18 up with the 90 days, recognizing that you have to go  
19 to award to provide these responses? Was there an  
20 evaluation that you performed?

21 MR. WOLFGANG: No.

22 MEMBER BONACA: I mean, can it be changed?

23 MR. WOLFGANG: It can be changed. It was  
24 an arbitrary period that we thought was --

25 MEMBER APOSTOLAKIS: Or you can reduce the

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1 requirement.

2 MR. WOLFGANG: Yes, or we can --

3 MEMBER APOSTOLAKIS: So we don't have  
4 these?

5 MR. FRUMKIN: No, you don't have these  
6 slides. We will be making them available.

7 MR. KLEIN: Just as a reminder, if I can  
8 just follow up on the 90-day issue and the comments in  
9 regard to that, we do have a bullet in there that, for  
10 licensees who can't meet that 90-day requirement, that  
11 within the 30 days, they come in and request an  
12 extension.

13 MEMBER MAYNARD: Yes. And I saw that in  
14 the generic letter. If it's a situation where you  
15 know 90 percent of the industry is not going to be  
16 able to do it, you might as well be able to pick a  
17 date where everybody is not having to do it. I'll be  
18 interested in hearing from the industry as to whether  
19 they think that is a burden or not. I think I am  
20 assuming it is, but it may not be. So I don't know.

21 MR. FRUMKIN: This is a bounding risk  
22 analysis for multiple spurious actuations. It was  
23 developed for this meeting by Ray Gallucci, Dr. Ray  
24 Gallucci, who is in the Fire Protection Section. And  
25 it's been presented as a paper for the American

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1 Nuclear Society presentation. I think this winter  
2 they're having a meeting.

3 I am the third string presenter of this  
4 document. Ray is the first string. Dr. Weerakkody is  
5 the second string. And I'm presenting out of  
6 necessity.

7 MEMBER DENNING: Is Ray here to get beaten  
8 upon if he --

9 MR. FRUMKIN: No. Ray is on inspection at  
10 Browns Ferry. So we have --

11 MEMBER APOSTOLAKIS: Last time he was here  
12 he --

13 MEMBER DENNING: No wonder he's at Browns  
14 Ferry.

15 MR. KLEIN: Let me clarify. He's on a  
16 program review at Browns Ferry. He's not on an  
17 inspection.

18 MR. FRUMKIN: Okay. I'm sorry. These  
19 slides will be made available. My understanding of  
20 this analysis is using an older plant PRA that Ray was  
21 involved in, he pulled out some of the important  
22 measures for some hot shorts. And he recombined them  
23 into multiple hot shots and, using a simplification  
24 process, determined a bounding risk analysis for those  
25 based on those important measures for one plant's PSA.

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1           So this is the typical older nuclear power  
2 plant, has a fire CDF of  $3.3^{-5}$ . And they used a hot  
3 short probability of .1. They had modeled 24 of the  
4 basic events. And that contributed about 5 percent to  
5 the fire CDF or  $1.8D^{-6}$ .

6           And then there were some systematically  
7 symmetric redundant train components that were chosen  
8 because I think they had more of a larger impact on  
9 the plant risk if they were to fail together. And  
10 that was a contribution of .03 to the fire CDF, those  
11 10 items.

12           MEMBER DENNING: Let's go slowly so we --

13           MEMBER APOSTOLAKIS: Yes.

14           MEMBER DENNING: -- understand what we  
15 have here.

16           MR. FRUMKIN: Okay.

17           MEMBER APOSTOLAKIS: Twenty-four hot short  
18 basic events above truncation. What does that mean?

19           MR. FRUMKIN: That in the model, the ones  
20 that had remained as important remained having  
21 importance measures in the model, that there were only  
22 24 hot shorts that remained there.

23           MEMBER APOSTOLAKIS: The core damage  
24 frequency due to hot shorts is  $1.8 \cdot 10^{-6}$  per year, it  
25 says.

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1 MR. FRUMKIN: Correct, assuming a hot  
2 short probability of .1.

3 MEMBER APOSTOLAKIS: Which was low.

4 MR. FRUMKIN: Which is low based on  
5 current data.

6 MEMBER KRESS: Okay. So one, it would be  
7 1.8 times  $10^{-5}$ .

8 MR. FRUMKIN: If you said 1.0, correct.

9 MEMBER DENNING: Now, you said that that's  
10 low, but don't forget here that now we're talking  
11 supposedly real nuclear power plants with fires where  
12 you would take into account the fact that the fire may  
13 not damage any cables, you know.

14 MR. FRUMKIN: Right. Well, this is from  
15 an --

16 MEMBER DENNING: Oh, this is --

17 MR. FRUMKIN: -- old fire PSA. So this  
18 does consider --

19 MEMBER DENNING: Yes, it does.

20 MR. FRUMKIN: -- many of those factors.

21 MEMBER DENNING: But saying that the  
22 probability of your hot short is .1 and saying, "Well,  
23 that is low," I think because we saw those other  
24 things where people say, "Well, it could be .6 or .2  
25 or something like that," --

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1 MR. FRUMKIN: Right.

2 MEMBER DENNING: -- and, therefore, this  
3 is low, that doesn't necessarily follow.

4 MR. FRUMKIN: I think this is the  
5 conditional hot short probability based on cable  
6 damage.

7 CHAIRMAN WALLIS: How about multiple  
8 shorts come into this?

9 MR. FRUMKIN: That is what we are going to  
10 be talking about.

11 CHAIRMAN WALLIS: This doesn't address  
12 that?

13 MR. FRUMKIN: No, no. Right. This is  
14 what this analysis is. So assuming that the  
15 components within each pair -- these are those ten  
16 items that have been paired -- have similar failure  
17 characteristics and locations, including their cable  
18 runs, again, this is a conservative assumption and  
19 that these comprise the full set of candidates for  
20 multiple spurious actuations that are not specifically  
21 modeled in the traditional IPEEEs as --

22 MEMBER APOSTOLAKIS: The number you showed  
23 us earlier assumes that these happen independently?

24 MR. FRUMKIN: Yes.

25 MEMBER DENNING: You know, I still don't

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1 understand the pairing. What is going on here? Is it  
2 ten corresponding to --

3 MEMBER APOSTOLAKIS: Ten of these?

4 MEMBER DENNING: Five paired components.  
5 That means that there is a --

6 MEMBER APOSTOLAKIS: Redundant elements.

7 MEMBER DENNING: They're redundant  
8 elements.

9 MEMBER APOSTOLAKIS: Yes.

10 MR. FRUMKIN: I believe what they did is  
11 of these 24, they took out 10 of them that could when  
12 combined have an issue.

13 MEMBER APOSTOLAKIS: They are still  
14 located in the --

15 MEMBER DENNING: It could lead to  
16 problems.

17 MR. FRUMKIN: On this slide, they're  
18 independent.

19 MEMBER APOSTOLAKIS: Yes.

20 MR. FRUMKIN: But I think what we're going  
21 to do is we're going to try to take out that and look  
22 at them as pairs. So this is what we're going to do,  
23 form a bounding analysis to estimate the potential  
24 maximum CDF due to multiple spurious actuations for  
25 this typical older MPP, which I think is what the

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1 target, the goal is here.

2 And now we start getting into some  
3 formulas. Per pair, one hot short corresponds to  
4 train A and the other to train B. So that's how they  
5 were paired. And they appear in symmetrically paired  
6 cut sets.

7 So one cut set, the CDF of A -- and  
8 there's the formula for that -- and the CDF of B,  
9 which is the fire initiator, and then the hot short or  
10 random failure of one of the paired components and  
11 then the summation of the B. Okay?

12 CHAIRMAN WALLIS: And where do the  
13 multiple shorts come in?

14 MR. FRUMKIN: This is the formula for --

15 CHAIRMAN WALLIS: It's between two trains,  
16 but it's not multiple shorts in the same cable.

17 MR. FRUMKIN: That's correct, not in the  
18 same cable.

19 CHAIRMAN WALLIS: It's still independent.  
20 And this formula that you have here, the cut sets, are  
21 still assuming that the --

22 MR. FRUMKIN: I think so. They're not  
23 going to be independent of the same fire and the same  
24 damage time, but they're going to be independent  
25 failures affected by the same fire.

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1 MEMBER APOSTOLAKIS: Conditional on the  
2 fire.

3 MR. FRUMKIN: Conditional on the fire.

4 MEMBER SIEBER: Which assumes the fire  
5 covers both things.

6 MR. FRUMKIN: Right, which is a  
7 conservative assumption in this analysis.

8 MEMBER SIEBER: Truly conservative.

9 MR. FRUMKIN: Yes.

10 MEMBER SIEBER: Improbable.

11 MR. FRUMKIN: Well, it depends on the  
12 design of the plant, but yes, it's --

13 MEMBER APOSTOLAKIS: So if I want to  
14 couple them, then, I will assume that Fa and Fb are  
15 just F, one fire. Is that correct? And then I will  
16 have --

17 MEMBER DENNING: A is --

18 MEMBER APOSTOLAKIS: Otherwise they are  
19 still independent. I mean, the fire initiator must be  
20 the same.

21 MR. FRUMKIN: Well, let's just hope that  
22 your answer --

23 MEMBER APOSTOLAKIS: We assume two  
24 different fires.

25 MEMBER DENNING: We'll go to the next

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1 slide. And maybe it will become clear.

2 MEMBER SIEBER: It's a lot clearer in  
3 here.

4 MR. FRUMKIN: Okay. So, again, we have --

5 MEMBER APOSTOLAKIS: This .1 comes from?

6 MR. FRUMKIN: The .1 was the  
7 state-of-the-art when they did this PSA of --

8 MEMBER APOSTOLAKIS: I'll tell you where  
9 it comes from.

10 MR. FRUMKIN: Okay.

11 MEMBER APOSTOLAKIS: That's 20 years or so  
12 ago.

13 MEMBER DENNING: You're responsible for  
14 .1?

15 MEMBER APOSTOLAKIS: I saw it, and I said,  
16 "Well, gee. How did you come up with that?"

17 So they said, "Well, call this guy"  
18 somewhere in California.

19 I called this guy. He says, "Well, you  
20 know Sandia told us that."

21 "What Sandia?"

22 "This person."

23 So I called this person in Sandia. He  
24 says, "Well, I really don't know. It's this other  
25 guy."

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1           So I called this other guy. And he says,  
2 "You told us that."

3           (Laughter.)

4           MEMBER DENNING: So we're going to accept  
5 the .1.

6           MEMBER APOSTOLAKIS: It wasn't followed up  
7 at all. I mean, that was the funniest thing.

8           MR. FRUMKIN: The IPEEE assumed this hot  
9 short probability of .1. And then I believe we're  
10 doing a simplification of these factors here. And it  
11 actually gets very simple on the next slide, but if  
12 anyone really wants me to read through this, I can  
13 try.

14           MEMBER DENNING: You know what we'll do?  
15 Let's go to the bottom line.

16           MR. FRUMKIN: The bottom line.

17           MEMBER DENNING: And we'll have copies of  
18 this.

19           MR. FRUMKIN: Okay. Yes.

20           MEMBER DENNING: And we'll --

21           MR. FRUMKIN: Okay. This is, I believe --  
22 well, let's see.

23           MEMBER APOSTOLAKIS: No. This is --

24           MR. FRUMKIN: This is the bottom line  
25 here.

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1 MEMBER APOSTOLAKIS: Go back a little bit.

2 MR. FRUMKIN: I think --

3 MEMBER APOSTOLAKIS: This Fa plus Fb I  
4 don't understand. I thought it was going to be 1.5.

5 CHAIRMAN WALLIS: That's two fires, isn't  
6 it?

7 MEMBER APOSTOLAKIS: This is one or the  
8 other, yes, one or the other.

9 MR. FRUMKIN: Yes.

10 MEMBER APOSTOLAKIS: It doesn't really --  
11 I mean, he should have assumed one fire as far as I  
12 can tell. But, again, the --

13 MEMBER DENNING: We will look at it  
14 carefully.

15 MEMBER APOSTOLAKIS: -- connection is  
16 nothing, I mean, right?

17 MEMBER DENNING: We will look at it  
18 carefully later.

19 MR. FRUMKIN: Right. That would be a  
20 small difference.

21 MEMBER DENNING: And Ray's bottom line  
22 again is?

23 MR. FRUMKIN: Okay. Well, what he does  
24 here is he's taking out the  $1.1E^{-6}$ . And he's putting  
25 in this value or coming up with this value of .011,

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1 which is his surrogate simplification for all of the  
2 fires and his X factor, which is his fire and his  
3 failure factor.

4 MEMBER APOSTOLAKIS: He's bounding the  
5 random failures, right, by assuming a  $10^{-3}$ , right?

6 MR. FRUMKIN: I believe so.

7 MEMBER APOSTOLAKIS: Yes.

8 MR. FRUMKIN: Typical, right.

9 MEMBER APOSTOLAKIS: But he doesn't know  
10 how many -- oh, this is a bound on all random failures  
11 that are required.

12 MR. FRUMKIN: Yes.

13 MEMBER DENNING: Continue. Let's see.

14 MR. FRUMKIN: Okay. And now he's talking  
15 about the dual failures. Any of the ten paired hot  
16 shorts would appear in the cut sets. And Fa is the S,  
17 which is your severity factor, which going to reduce  
18 your likelihood of more hot shorts, which is the  
19 likelihood of having a big fire that's going to cause  
20 this damage.

21 CHAIRMAN WALLIS: Which affects both  
22 trains?

23 MR. FRUMKIN: Right. And then your  
24 various factors, A hot, B hot short, and then your  
25 random factors.

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1 MEMBER APOSTOLAKIS: Why square? Why A  
2 hot times A hot? It still assumes that they're  
3 independent events, right?

4 CHAIRMAN WALLIS: Well, that is the A hot  
5 times B hot --

6 MEMBER DENNING: It is going to take us  
7 some time to really work through this. Rather than do  
8 this here, --

9 MR. FRUMKIN: Okay.

10 MEMBER DENNING: -- let's go see Ray's  
11 bottom line.

12 MR. FRUMKIN: Okay. The bottom line is  
13 here.

14 MEMBER APOSTOLAKIS: All right.

15 MR. FRUMKIN: So for his choice of fires,  
16 for severity factor, I think he used a .1 for this  
17 extreme fire, which is an S.

18 CHAIRMAN WALLIS: Why is .1 extreme? It  
19 could be .5.

20 MR. FRUMKIN: Oh, no, no, no. This is for  
21 the likelihood of a large fire.

22 CHAIRMAN WALLIS: Yes. But just asking  
23 George Apostolakis by telephone tag --

24 MR. FRUMKIN: Oh, no. This is not his .1.

25 CHAIRMAN WALLIS: I thought it was his .1.

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1 MR. FRUMKIN: It's somebody else's .1.

2 MEMBER APOSTOLAKIS: This is from one of  
3 my students.

4 MR. FRUMKIN: That's right. Right. This  
5 .1 is from very likely the fire protection STP, which  
6 says that severe fires happen or ten percent of all  
7 fires that happen are severe, which is, again, a  
8 conservative number based on the state-of-the-art,  
9 which is the 6850 analysis.

10 But that's what we're doing with -- I  
11 mean, this is no question about it. This is a  
12 bounding analysis.

13 CHAIRMAN WALLIS: The ones that cause hot  
14 shorts?

15 MR. FRUMKIN: No. Instead of using a  
16 severity factor of one, assuming that all fires will  
17 cause the damage, we're only assuming that ten percent  
18 of the fires will cause the damage to cause hot short.  
19 So there are many different ways of severity --

20 MEMBER APOSTOLAKIS: So this .011, .011,  
21 is the frequency of fire or, no, this is from the  
22 random failure?

23 MR. FRUMKIN: Right.

24 MEMBER APOSTOLAKIS: According to one is  
25 one?

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1 MR. FRUMKIN: That's the severity factor.

2 MEMBER APOSTOLAKIS: What is the frequency  
3 of fire?

4 MR. FRUMKIN: What I believe he has done  
5 is I believe he has back-calculated through his  
6 simplification that .1 that he used. And he's turned  
7 that, the whole -- all of his important measures into  
8 this .011.

9 MEMBER APOSTOLAKIS: So that includes the  
10 frequency of fire?

11 MR. FRUMKIN: I believe so.

12 MEMBER APOSTOLAKIS: That's a pretty high  
13 number.

14 MR. FRUMKIN: Yes.

15 MEMBER DENNING: We are going to look at  
16 this carefully, but his bottom line is saying, well,  
17 what this could do in this particular case is it could  
18 have increased by a factor of three the fire damage  
19 frequency.

20 MR. FRUMKIN: I think what he's trying to  
21 say here is that when he back-calculates from his  
22 importance measures and then he combines these pairs,  
23 that -- and this is the bottom line here -- he can  
24 have a maximum of  $10^{-4}$  per year due to these pairs of  
25 hot shorts.

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1 MEMBER DENNING: And without it, they had  
2 3 times  $10^{-5}$  is what this plant did.

3 MR. FRUMKIN: Yes. That's the whole fire  
4 risk for the plant, is 3 times  $10^{-5}$ . So this could be  
5 dominating.

6 MEMBER APOSTOLAKIS: But why couldn't you  
7 go to an actual PRA and fix, instead of whatever they  
8 had, and see what happens, rather than doing this  
9 undue analysis? I mean, there are detailed fire PRAs  
10 out there.

11 MR. FRUMKIN: We don't actually have one  
12 in the office. He did have this information available  
13 to him.

14 MEMBER DENNING: What I would like to do  
15 is we would definitely like copies. Don't go  
16 anywhere.

17 MR. FRUMKIN: Okay.

18 MEMBER DENNING: And I don't think you  
19 have to read that. What we would like -- I mean, you  
20 can actually --

21 MR. FRUMKIN: Well, here his last slide is  
22 at least for a typical older nuclear power plant, one  
23 cannot a priori dismiss multiple hot shorts of being  
24 of lower significance.

25 MEMBER DENNING: Okay.

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1 MEMBER APOSTOLAKIS: Well, I would like to  
2 see the paper, please. No, no. Give me a copy.

3 MEMBER DENNING: Right. Yes, if we may.  
4 What we would like to do now is we would like to hear  
5 now from NEI, if we could. Don't run away, Research.

6 MEMBER APOSTOLAKIS: Don't anybody go  
7 away.

8 MEMBER DENNING: Don't anybody leave town  
9 other than me, but I would definitely like to make  
10 sure we have plenty of time to hear from NEI.

11 MEMBER APOSTOLAKIS: That's what I call  
12 running and meeting with --

13 MEMBER DENNING: The policeman is asked to  
14 lock the doors.

15 MEMBER APOSTOLAKIS: We have a cop  
16 outside?

17 MEMBER DENNING: And, Alex, you don't have  
18 handouts, but we can make them. Is that a true  
19 statement?

20 MR. MARRION: No, I do not have handouts.  
21 I do have a couple of comments.

22 MEMBER DENNING: You have comments?

23 MR. MARRION: Yes.

24 MEMBER DENNING: But you don't have any  
25 papers?

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1 MR. MARRION: No.

2 MEMBER DENNING: Okay. Please proceed.

3 MR. MARRION: Good morning. My name is  
4 Alex Marrion. I am a Senior Director of Engineering  
5 at NEI, and I appreciate the opportunity to offer a  
6 couple of comments on our perspectives on what we  
7 heard this morning.

8 Before I begin, I want to point out that  
9 we have two utility representatives, one from Progress  
10 Energy and one from Duke Power, who represent the two  
11 pilot plants for the application of NFPA 805.

12 And if the Committee so desires, I think  
13 it may be useful for you to understand the  
14 implications of this generic letter on the NFPA 805  
15 risk-informed application process. And I'll defer to  
16 you to --

17 MEMBER DENNING: We so desire.

18 MR. MARRION: Okay. Very good. Now I'll  
19 ask them to step up when I finish my comments.

20 To get back to Dr. Apostolakis' --  
21 George's comment, --

22 (Laughter.)

23 MR. MARRION: -- the test protocol and the  
24 issue of having cables exposed in the flaming region,  
25 I don't have any direct knowledge of that discussion

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1 with the NRC staff at the time we developed the test  
2 protocol. This was the first I heard of it, but I'll  
3 look into it. And we'll try to get an answer to you  
4 at the end of the week.

5 I do want to make it clear that we believe  
6 the multiple spurious actuation is a new regulatory  
7 position that results in significant impact on utility  
8 licensees, not only on the Appendix R, the NUREG 0800  
9 plants but also on the NFPA 805 plants.

10 The impact is significant in that it  
11 changes the methodologies that the utilities have  
12 credited in their licensing basis over the last 20  
13 years. So the licensing basis has to change.

14 Now, with that, it's perfectly appropriate  
15 for the NRC to say, "There's new information that has  
16 been brought to bear on this topic. And we have a new  
17 position." That's fine. But the NRC must bear the  
18 burden of demonstrating the safety impact of that new  
19 position and do a regulatory analysis to substantiate  
20 it because of the significant implications on the  
21 utility licensee design basis.

22 That's straightforward, but one thing that  
23 this position does not take into account is the  
24 fundamental elements of defense-in-depth relative to  
25 fire protection. What I'm talking about is the

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1 actions that are taken by licensees in preventing  
2 fires from occurring and detecting a fire when it does  
3 occur, having systems and personnel to respond to the  
4 fire to mitigate the consequences of the fire,  
5 suppression and detection systems, and then ultimately  
6 recovering the plant to assure that you can get into  
7 a safe condition.

8 We understand there is value to looking at  
9 risk-informed approaches and changes and assumptions  
10 and evaluating them accordingly, but I would recommend  
11 that we not lose sight of the defense-in-depth  
12 concepts as we go through this process going forward.

13 This generic letter is another example of  
14 what is fundamentally flawed with fire protection  
15 regulations and has been a problem with fire  
16 protection regulations and the associated regulatory  
17 process over the last 25 or 35 years.

18 And by that, I mean we have a continuous  
19 evolution of NRC positions and expectations that are  
20 addressed in a somewhat informal manner. And by that,  
21 I mean use of generic communications to articulate  
22 regulatory positions is, quite frankly, inappropriate.

23 New regulatory positions should be  
24 evaluated in terms of safety impact or clearly  
25 demonstrating the compliance issue associated with

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1 that new position. Then that has to be made publicly  
2 available so that the licensees can understand what  
3 these new positions are and what the basis for the  
4 positions are.

5 Historically in fire protection, it's been  
6 a plant-specific fire protection engineer from the  
7 licensee to an NRC inspector agreement of what the  
8 understanding is relative to an interpretation. And  
9 that is the problem that we're trying to fix. That's  
10 why we are so firm in our comments going forward,  
11 because fundamentally, gentlemen, if we don't address  
12 or we don't identify resolution to the spurious  
13 actuation issue today, it will be an issue for the  
14 NFPA 805 plants.

15 Going to 805 does not provide a resolution  
16 to this issue today because there is no understood  
17 methodology that can address the staff's position. I  
18 want to make that very clear.

19 MEMBER APOSTOLAKIS: Is this the  
20 open-ended issue that we discussed earlier?

21 MR. MARRION: Yes, yes. The comments made  
22 about CRGR approval of this generic letter, as an  
23 external stakeholder, that essentially is meaningless  
24 to us, reason being we are not privy to any kind of  
25 disciplined process that is used by CRGR or anyone

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1 within the NRC that clearly demonstrates this is the  
2 basis for the safety concern or this is the basis for  
3 the compliance concern.

4 What we have seen over the years -- and  
5 this is another example -- where the preferred route  
6 appears to be, well, let's make it a compliance  
7 concern because we as a regulatory agency, the NRC,  
8 can interpret the regulations. We have the right to  
9 interpret the regulations, et cetera, which is fine,  
10 but let's put the interpretation on paper. Let's  
11 identify resolution path so we have a common  
12 understanding going forward. We don't have that today  
13 on this particular issue.

14 Lastly, I would like to say that there  
15 isn't a generic letter that is simply a request for  
16 information. It should be clear from the discussion  
17 this morning that this generic letter basically  
18 imposes a new regulatory requirement that has  
19 significant impact on the licensing basis of current  
20 plants. That is not a request for information.

21 Those are the comments that I wanted to  
22 make this morning. I don't know if you have any  
23 questions on anything I said.

24 MEMBER DENNING: Yes, we do have some.  
25 One of them has to do with the timing, the 90 days,

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1 and the timing required to do the kind of analysis  
2 that's being requested there. Do you have a feeling  
3 as to what an appropriate time would be?

4 I mean, there's a timing that says, are  
5 you in compliance with this, which, regardless of this  
6 question, whether it's a new regulation or an old,  
7 there's no question the plant can determine that  
8 fairly quickly. But doing the entire analysis and  
9 determining what affected SSCs are, do you have any  
10 indication from the plants as to how much time that  
11 might take and what an appropriate time frame would be  
12 for a response like --

13 MR. MARRION: I don't have the information  
14 to answer the question, but I would submit that the  
15 next two individuals may be able --

16 MEMBER DENNING: May be of help on it?

17 MR. MARRION: -- to give you their  
18 perspectives.

19 MEMBER DENNING: Okay. Good.

20 MEMBER MAYNARD: Could I just --

21 MEMBER DENNING: Yes?

22 MEMBER MAYNARD: Your perspective comment  
23 was made that if the generic letter is not issued,  
24 then it would just have to be dealt with in inspection  
25 space. Do you have any comment on that?

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1 MR. MARRION: It is being dealt with in  
2 inspection space. Now, what we don't have is an  
3 external stakeholder. When I mention "we," I'm  
4 speaking of NEI and the industry. What is the safety  
5 case or what is the compliance case? And we haven't  
6 seen evidence of that clearly demonstrated that NRC  
7 action in this particular area is necessary in an  
8 expedited manner.

9 VICE CHAIRMAN SHACK: Just to address your  
10 methodology question, apparently you can deal with  
11 multiple actions if they come sequentially. So you  
12 have a methodology for that. And you're arguing that  
13 there isn't a methodology.

14 So it isn't necessarily the open-endedness  
15 of it that's the problem?

16 MR. MARRION: There isn't a methodology  
17 for addressing all spurious actuations in a given  
18 fire. Utilities had --

19 VICE CHAIRMAN SHACK: You can address them  
20 one at a time.

21 MR. MARRION: You can address them one at  
22 a time. And I would ask that the two utility  
23 representatives explain their methodology for circuit  
24 analysis. I think we would find that very insightful.

25 MEMBER DENNING: Good.

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1 MR. MARRION: But it's changed. And then  
2 what I would like to do is ask Dave Miskiewicz from  
3 Progress Energy and Harry Barrett from Duke Power.

4 CHAIRMAN WALLIS: I would bring up the  
5 point before you leave --

6 MR. MARRION: Yes?

7 CHAIRMAN WALLIS: You talked about the  
8 role of a generic letter and whether it just requests  
9 information. We have another generic letter on sumps,  
10 which you may be aware of, right?

11 MR. MARRION: I am generally aware of that  
12 one.

13 CHAIRMAN WALLIS: It not only requested  
14 information. It requested analysis, and it requested  
15 plans. And, in fact, it's resulted in large changes  
16 in the plant by a result of a generic letter.

17 MR. MARRION: Yes.

18 CHAIRMAN WALLIS: So it's not as if this  
19 is a unique generic letter, which is actually asking  
20 plants to do much more than just supply information.

21 MR. MARRION: My only point is a request  
22 for information as this generic letter is  
23 characterized as a mischaracterization of what its  
24 impact is.

25 CHAIRMAN WALLIS: Well, it clearly isn't

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1 that. I mean, it says a request for information and  
2 taking additional actions. I mean, the sentence asks  
3 for more than just information.

4 MR. MARRION: Okay?

5 MEMBER DENNING: Okay. Let's have our  
6 visitors come up.

7 MR. FRUMKIN: If I could add? This is Dan  
8 Frumkin. Just one point. The inspections started  
9 again in January of 2005, but there is still currently  
10 enforcement discretion for all circuit findings. And  
11 so there may be a perception that this has not turned  
12 into an issue yet because of a lack of enforcement in  
13 this area.

14 So starting in September 2006, enforcement  
15 will proceed for plants that do not have enforcement  
16 discretion under NFPA 805. So I just want to put that  
17 out there that currently there are no enforcement  
18 actions in this area for plants that take compensatory  
19 measures and have correction action plans.

20 MEMBER DENNING: Introduce yourselves,  
21 please.

22 MR. BARRETT: Good morning. My name is  
23 Harry Barrett. I work at Duke Power. I'm the  
24 three-site lead for NFPA 805 transition for all three  
25 of these sites in Duke Power's nuclear fleets. I just

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1 wanted to say a few words about the multiple spurious  
2 issue as it affects 805.

3           Although 805 is a risk-informed,  
4 performance-based rule, it is based on your current  
5 licensing basis going forward. And if that is  
6 questionable, then your regulatory foundation that  
7 you're billing it on would be questionable in 805,  
8 which ends up leading to a lot more effort and a lot  
9 more analysis required for that.

10           So this multiple spurious issue is adding  
11 a significant amount of paperwork and analysis to 805  
12 transition. The original concept was you would take  
13 your fire protection licensing basis, map it over to  
14 the 805 requirements, and it was pretty much just a  
15 paper transition.

16           With this new multiple spurious and the  
17 complications that that adds to the fire PRA, we're  
18 looking at a significant amount of engineering effort  
19 that goes into that.

20           It's going to take us over two years to do  
21 the transition for Oconee, which is the first plant.  
22 And a lot of that, most of that, is the PRA in the  
23 multiple spurious issue.

24           MEMBER APOSTOLAKIS: Do you agree that it  
25 is an issue?

1 MR. BARRETT: I agree that it needs to be  
2 looked at. I have not seen a multiple spurious  
3 scenario that is risk-significant yet.

4 MEMBER APOSTOLAKIS: Do any of your plant  
5 have a detailed fire PRA?

6 MR. BARRETT: We have a fire PRA. We have  
7 --

8 MEMBER APOSTOLAKIS: Not IPEEE, though?

9 MR. BARRETT: We had an early '80s vintage  
10 fire PRA, but we are putting together a NUREG 6850,  
11 the new version of it.

12 MEMBER APOSTOLAKIS: Okay. So --

13 MR. BARRETT: We're doing that now.

14 MEMBER APOSTOLAKIS: It would be, then,  
15 possible for you to go back to that PRA and see what  
16 happens if you assume multiple --

17 MR. BARRETT: It assumed multiple in the  
18 original analysis. To use the core melt, we needed to  
19 use multiples for that particular analysis. So it  
20 included --

21 MEMBER APOSTOLAKIS: The number came out  
22 okay?

23 MR. BARRETT: It came out relatively high.  
24 I don't remember the exact number, but fire was a  
25 fairly significant contributor to risk in the --

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1 MEMBER APOSTOLAKIS: Not fire overall,  
2 but, I mean, this particular mode with --

3 MR. BARRETT: Spurious?

4 MEMBER APOSTOLAKIS: Yes.

5 MR. BARRETT: If I remember right, many of  
6 the combinations that we analyzed were within the  
7 bounds of the Appendix R analysis originally for  
8 control room evacuation. The main fire area that we  
9 got into trouble with the IPEEE or the fire PRA, the  
10 original one, was in our cable shaft going up to the  
11 control room, where we had just about every cable in  
12 the plant going through one area. And so --

13 MEMBER APOSTOLAKIS: It seems to me that  
14 --

15 CHAIRMAN WALLIS: Did you assume multiple  
16 spurious actuations, simultaneous, and all of this?

17 MR. BARRETT: In that particular PRA, we  
18 ended up having to go to multiple spurious actuations  
19 in order to get the core damage.

20 CHAIRMAN WALLIS: Okay. Including  
21 simultaneous actuations.

22 MEMBER APOSTOLAKIS: So it would be  
23 interesting, then, to compare your numbers and  
24 analysis with the bounding analysis that the NRC staff  
25 has done to see which one makes sense.

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1 I mean, it seems that we do have a body of  
2 knowledge there that at least I as a member of this  
3 Committee don't seem to have access to. I don't know  
4 whether the rest of the members are familiar with it,  
5 but I doubt it.

6 So, I mean, it would be nice to see that,  
7 especially since you have done it already, I mean.

8 MR. BARRETT: Yes. The original analysis  
9 was nowhere the rigor that 6850 requires now.

10 MEMBER APOSTOLAKIS: I understand that.  
11 I mean, you --

12 MEMBER SIEBER: It is just one plant. So  
13 it's not clear to me how you can extend that to some  
14 --

15 MEMBER APOSTOLAKIS: Yes. But it provides  
16 a basis for judging what Ray Gallucci did.

17 MEMBER SIEBER: It gives you an idea.

18 MEMBER APOSTOLAKIS: Yes. And also what  
19 kind of effort it takes to do it because under NFPA  
20 805, it seems to me that if you find -- as I recall.  
21 Maybe I'm wrong. As I recall, you're right. You're  
22 supposed to meet the regulations, but if you don't  
23 meet some of them, then you can argue in risk space.

24 MR. BARRETT: Right.

25 MEMBER APOSTOLAKIS: Right?

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1 MR. BARRETT: Right.

2 MEMBER SIEBER: You don't need to.

3 MEMBER APOSTOLAKIS: But you don't need to  
4 go back and comply. So, I mean, there is a way out of  
5 it depending on the quality of the risk assessment.

6 MEMBER SIEBER: That would be a basis for  
7 an exemption, but you can't just sit there and do  
8 nothing.

9 MEMBER APOSTOLAKIS: But is that  
10 consistent with a statement that it does a lot of  
11 work, paperwork? I mean, if you already have the PRA,  
12 why does it add a lot of work? But you just said  
13 that, right?

14 I'm sorry. I don't remember your name.

15 MR. BARRETT: Harry.

16 MEMBER SIEBER: The PRA is not  
17 state-of-the-art.

18 MR. BARRETT: Right. The original PRA is  
19 not state-of-the-art.

20 MEMBER SIEBER: They have to do the work.

21 MR. BARRETT: The one that they are doing  
22 now is state-of-the-art. They're using 6850 and --

23 MEMBER APOSTOLAKIS: When do you expect it  
24 to be completed?

25 MR. BARRETT: It should be complete by

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1 probably June of next year.

2 VICE CHAIRMAN SHACK: When you do your  
3 state-of-the-art PRA, you're going to consider  
4 multiple actuations, right?

5 MR. BARRETT: Yes.

6 MEMBER APOSTOLAKIS: Yes. So, I mean, is  
7 it clear to everyone? I mean --

8 MR. BARRETT: We are taking significant  
9 efforts to make sure we get our best chance at finding  
10 those multiple spurious risk --

11 VICE CHAIRMAN SHACK: But it seems to me  
12 that anybody doing a fire PRA is going to have to  
13 consider multiple --

14 MEMBER DENNING: Do they have to consider  
15 them as comprehensively as here? Because they will  
16 have screening criteria. And I guess can you tell me  
17 if you weren't -- you know, suppose you were not  
18 heading towards that.

19 If you are sitting there and you had to do  
20 this analysis, how long would it take you to do this  
21 analysis? And how difficult would it be to -- would  
22 you have to modify the plant to be able to accommodate  
23 it?

24 MR. BARRETT: I am not sure about that.  
25 What we would probably end up doing is using the

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1 guidance in NEI-0001, chapter 4, which is the risk  
2 analysis piece of that, which is, in essence, doing a  
3 mini PRA for the --

4 MEMBER DENNING: But you're not allowed to  
5 use that. I mean, by this generic letter, you're only  
6 allowed to do that if you're then going to look for  
7 exemptions.

8 MR. BARRETT: Right, yes. You're not  
9 doing 805. That's your only other --

10 MEMBER DENNING: Yes.

11 MR. BARRETT: I mean, you need to modify  
12 the plant or you --

13 MEMBER DENNING: Modify the plant. How  
14 long would it take you to do that analysis in --

15 MR. BARRETT: Guessing, I would say  
16 probably a year.

17 MEMBER DENNING: Probably a year. I mean,  
18 what is in here says 90 days.

19 MR. BARRETT: No way.

20 MEMBER DENNING: There's no way?

21 MR. BARRETT: No way.

22 MEMBER DENNING: You would think that --

23 MEMBER SIEBER: Well, you can tell in 90  
24 days roughly how long you think it's going to take you  
25 to do it.

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1 MEMBER DENNING: Absolutely.

2 MEMBER SIEBER: But that's not what  
3 they're asking.

4 MEMBER DENNING: But that's not what  
5 they're asking.

6 MR. BARRETT: I mean, your choices are to  
7 take your safe shutdown analysis and just say that  
8 everything in a given fire areas fails immediately.

9 MEMBER SIEBER: That is the way you used  
10 to do it.

11 MR. BARRETT: And you can't do it.

12 MEMBER SIEBER: No.

13 MR. BARRETT: I mean, with the acceptance  
14 criteria you have in Appendix R, having water level go  
15 out of the pressurizer, you can do that with just a  
16 couple of spurious actuations. If you do all of them,  
17 you're never going to make it. So I don't know how  
18 you do that in 90 days.

19 MR. WOLFGANG: This is Bob Wolfgang with  
20 again --

21 MEMBER DENNING: Go ahead, Bob.

22 MR. WOLFGANG: The 90 days, what we have  
23 currently in the generic letter is for functionality  
24 assessment. To submit any exemption requests,  
25 amendment requests, that's the six-month period.

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1 MEMBER DENNING: Yes, but what I am  
2 missing is to do the functionality assessment, don't  
3 you have to do basically the analysis?

4 MR. BARRETT: Yes. That is essentially an  
5 operability assessment. Are components operable? In  
6 order to know that, you have to do the analysis to  
7 know what gets damaged and when. There's no way  
8 you're going to do that in a short time, no way.

9 MEMBER DENNING: Dave, did you want to  
10 make some comments?

11 MEMBER SIEBER: Before we switch, one  
12 thing that you said that I think is important is you  
13 really can't get the core damage unless you have  
14 multiple spurious actuations.

15 MR. BARRETT: We have some singles that  
16 get us in trouble, and we're going to have to fix  
17 those. But as far as getting into the core damage,  
18 I'm not even sure --

19 MEMBER SIEBER: This would be opposing  
20 trains, too, right?

21 MR. BARRETT: Well --

22 MEMBER SIEBER: Train A, train B pairs.

23 MR. BARRETT: By the fire PRA methodology,  
24 you're really not even worrying about 3G2 or 3G3  
25 anymore. You're looking at fires anywhere and damage

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1 to all of the circuits.

2 MEMBER SIEBER: Right.

3 MR. BARRETT: So you're really looking at  
4 controlling fires and cable room fires and all of  
5 that. And, you know --

6 MEMBER SIEBER: But if you were to make  
7 the assumption that you only have one spurious  
8 actuation, you wouldn't get the core damage. And you  
9 could just say, "I don't need to do anything," right?

10 MEMBER APOSTOLAKIS: Well, it depends on  
11 what else fails.

12 MR. BARRETT: Yes. I think it depends  
13 largely on --

14 MEMBER SIEBER: It would be an on-fire --

15 MR. BARRETT: -- what other failures --

16 MEMBER SIEBER: -- a non-fire-induced  
17 failure, right?

18 MEMBER DENNING: There has to be a core  
19 damage frequency, though. I mean, when you said you  
20 wouldn't get core damage frequency with a single  
21 failure, you have to because you have other unrelated,  
22 but it's just very low.

23 MR. BARRETT: Also we are talking hot  
24 shorts here, but you also have fire-related damage,  
25 which takes the component out of service, which is not

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1 included in that spurious operation probability.

2 So it's a much more complicated things to  
3 get your arms around as far as loss of all electrical  
4 power, loss of indication, and all of that. It's more  
5 than that.

6 MEMBER DENNING: Yes?

7 MEMBER SIEBER: Thanks.

8 MEMBER DENNING: Dave?

9 MR. WOLFGANG: Excuse me.

10 MEMBER DENNING: Yes?

11 MR. WOLFGANG: This is Bob Wolfgang again.

12 So Duke's response to this generic letter  
13 would be we're addressing it. We're transition to  
14 NFPA 805. And we're going to address multiple  
15 spurious actuations in that transition.

16 MR. BARRETT: Yes, sir.

17 MR. WOLFGANG: And that is the total  
18 response we're looking for from --

19 MR. BARRETT: We will give you a schedule  
20 of when we think that will be done, yes.

21 MEMBER DENNING: Okay. If that is what  
22 you are asking for, you're going to have to change the  
23 generic letter.

24 MR. BARRETT: No.

25 MEMBER DENNING: My interpretation. Well,

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1 we'll look at that.

2 Dave, why don't you go ahead and say a few  
3 words?

4 MR. MISKIEWICZ: Okay. My name is Dave  
5 Miskiewicz. I'm from Progress Energy. I'm the lead  
6 PRA supporting the transition to 805 at all of our  
7 units.

8 MEMBER APOSTOLAKIS: PRA?

9 MR. MISKIEWICZ: I'm the lead PRA engineer  
10 supporting our transition.

11 MEMBER APOSTOLAKIS: I thought you said  
12 "elite."

13 (Laughter.)

14 MR. MISKIEWICZ: That does sound good.

15 A lot of the discussion I'm hearing, my  
16 perspective is probably a little bit different than  
17 the normal compliance.

18 MEMBER APOSTOLAKIS: That's why we want  
19 it.

20 MR. MISKIEWICZ: You know, there is  
21 uncertainty. And I am used to dealing with the  
22 uncertainty as how much probability I can assign to  
23 something, can I take credit for these actions and all  
24 the various things on there.

25 One of the things that strikes me is when

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1 I look at the bounding analysis and it seems like  
2 we're trying to get the best of both worlds. We want  
3 to address everything in totality and also assure that  
4 we don't have that risk.

5 You know, when I deal with traditional  
6 design basis, we are allowed one single failure. And  
7 we assume no off-site power. And we give an  
8 initiating event that happens, and that is a given.

9 PRA, we will look at multiple failures.  
10 And we may find things that are more vulnerable that  
11 weren't even addressed under compliance. And I see  
12 kind of a similar thing here except for instead of  
13 saying, "Address a single failure," we're looking at  
14 "You've got to find them all."

15 And that just seems like an impossible  
16 task. Even in the PRA world, we can model a lot of  
17 stuff, but we're still not going to get them all. But  
18 we try to find the significant things. We're trying  
19 to gear down to get the significant issues.

20 As far as the workload goes that I see on  
21 the generic letter, I think it would be significant.  
22 I'm not the circuit analysis person but when I start  
23 throwing in non-currently credited equipment into that  
24 list that I want circuits routed for and cables routed  
25 for, it is a big workload for the electrical guys who

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1 are going to be doing that work. And I would see that  
2 as a resource drain on the overall transition effort  
3 for me.

4 In fact, if I saw them, you know, all of  
5 a sudden, focusing on one area and not another area,  
6 I'm not even sure how they would be able to get all of  
7 them without doing the PRA perspective.

8 MEMBER APOSTOLAKIS: I am a little bit --  
9 I don't know what the right word is, but we keep  
10 talking about the workload. It seems to me we should  
11 be talking about the real issue.

12 Is there a real issue here? Is there a  
13 contributor to risk that we have not handled in the  
14 past or managed well? I mean, the workload I'm sure  
15 you will agree, too, it's a major contributor to risk.  
16 We have to do something about it.

17 MR. MISKIEWICZ: I agree.

18 MEMBER APOSTOLAKIS: And, you know, the  
19 thing that made me happy with Duke is that they are  
20 doing the PRA. They will consider the multiple hot  
21 shorts or spurious situations. Is your company doing  
22 something similar or --

23 MR. MISKIEWICZ: We are doing the PRA.  
24 And we're going to in the PRA model the hot shorts,  
25 the spurious actuations.

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1 MEMBER APOSTOLAKIS: According to the  
2 latest information we have and everything?

3 MR. MISKIEWICZ: When we say important,  
4 too, it's almost, you know --

5 MEMBER APOSTOLAKIS: You're not going to  
6 use .1? You're going to use .6, for example?

7 MR. MISKIEWICZ: We'll use whatever the  
8 methodology recommends.

9 MEMBER BONACA: You can go to Professor  
10 Apostolakis if you remember.

11 MEMBER APOSTOLAKIS: Give me a call. I'll  
12 tell you.

13 (Laughter.)

14 MR. MISKIEWICZ: It's .1. And we're  
15 working through those issues, but even doing that is  
16 going to be limited somewhat. You know, there are  
17 screening techniques and things used that we're going  
18 to work our way through as to which circuits really  
19 need to be evaluated.

20 MEMBER DENNING: Do you think the approach  
21 is clearly defined as to how you come up with a  
22 probability for these actuations?

23 MR. MISKIEWICZ: Right.

24 MEMBER DENNING: There is some randomness  
25 that one assumes in terms of which circuits can

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1 connect with which other circuits to --

2 MR. MISKIEWICZ: I think what we know now  
3 is better than what we knew ten years ago when we were  
4 dealing with this.

5 MEMBER DENNING: Yes. But it isn't  
6 obvious to me even what the best approach is to doing  
7 that within the fire PRA, let alone deterministically.

8 MEMBER APOSTOLAKIS: So the position,  
9 then, of at least you two gentlemen and maybe the  
10 industry is that this generic letter is unnecessary,  
11 that you are handling the issue of multiple spurious  
12 actuations via the PRA and as you transition to it --  
13 are you transitioning to 805?

14 MR. MISKIEWICZ: Yes, we are.

15 MEMBER APOSTOLAKIS: As you transition to  
16 805, you may have to come back to the NRC and, using  
17 risk arguments, request an exemption of some sort. Is  
18 that your position?

19 MEMBER BONACA: Well, I heard it  
20 differently.

21 MEMBER APOSTOLAKIS: What?

22 MEMBER BONACA: I heard it differently.  
23 I heard simply that the burden should be on the NRC to  
24 perform. Okay.

25 MEMBER APOSTOLAKIS: But they are handling

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1 it already.

2 MEMBER BONACA: Yes.

3 MR. BARRETT: We are handling multiple  
4 spurious in the PRA as part of the 805 transition.

5 MEMBER APOSTOLAKIS: And then what?

6 MR. BARRETT: And then we're going to  
7 follow the industry guidance and the regulatory  
8 guidance provided by the NRC. And depending upon  
9 where the thresholds fall in relation to the  
10 self-approval thresholds, if it's less than the  
11 self-approval threshold, then we'll end up  
12 self-approving an exemption in accordance with the NRC  
13 rules for 805 implementation.

14 MEMBER APOSTOLAKIS: Right, right.

15 MR. BARRETT: If it's over that threshold,  
16 then we'll end up having to --

17 MEMBER APOSTOLAKIS: Come back.

18 MR. BARRETT: -- contact the staff and  
19 work out whether we have to modify or whether we can  
20 leave the situation as is.

21 MEMBER APOSTOLAKIS: The conclusion one  
22 can draw from this is that you believe that this  
23 generic letter is unnecessary because there is already  
24 a process in place. Is that correct?

25 MR. BARRETT: For 805, for their plants.

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1 Not everyone is --

2 MEMBER APOSTOLAKIS: Why wouldn't another  
3 plant apply the same thing?

4 MEMBER SIEBER: It is an optional process.  
5 Some plants --

6 MEMBER APOSTOLAKIS: Oh, they don't --

7 MEMBER SIEBER: -- may decide not to do  
8 anything at all.

9 MEMBER APOSTOLAKIS: If they don't  
10 transition to 805, you mean?

11 MEMBER SIEBER: Yes.

12 MR. MARRION: If I may, Dr. Apostolakis,  
13 there are 40 plants that have submitted letters of  
14 intent to the NRC. The resolution of this issue for  
15 the 805 plans has yet to be determined. The approach  
16 is the use of the PRA, do the modeling -- all right?  
17 -- and then define that.

18 But that would be applicable to those 40  
19 plants. The other plants, the balance of the  
20 industry, have used any combination of the single  
21 failure to three or four failures.

22 You heard mention of NEI-001 that has the  
23 methodology, both -- two methodologies: deterministic  
24 and risk-informed. We piloted that at two plants.

25 And so we can't take credit for that

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1 anymore because of this new position with the generic  
2 letter. But I suspect that the solution will be had  
3 with the pilot exercise over the next several months  
4 to a year possibly and that that's the solution that  
5 needs to be evaluated for applicability to the non-805  
6 plants because, absent that, I don't see anyone coming  
7 up with a generic solution for the non-805 plants  
8 today. And it is going to be based upon PRA.

9 MR. MISKIEWICZ: Even in 805, though, when  
10 we do a fire PRA, there will be some iterative  
11 process. You know, we're dependent on the circuit  
12 analysis people giving us the information that we need  
13 to model. And so we're going to try to get risk to  
14 make sure we're modeling the right areas.

15 MEMBER SIEBER: Just the basic methodology  
16 of PRAs causes you to consider multiple spurious --

17 MR. MISKIEWICZ: If you model all of your  
18 singles and multiples from singles --

19 MEMBER SIEBER: That's the way it is.

20 MEMBER APOSTOLAKIS: But in the old days,  
21 in the first PRAs, I don't think we considered that.

22 MR. MISKIEWICZ: You modeled your singles.  
23 And they would combine in your results to give you  
24 multiples.

25 MEMBER SIEBER: Part of the process.

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1 MR. MISKIEWICZ: Yes. But you would still  
2 have to model the spurious event was a failure mode  
3 for that specific piece of equipment, --

4 MEMBER SIEBER: Right.

5 MR. MISKIEWICZ: -- which depends on the  
6 circuit analysis people telling you where that --

7 MEMBER SIEBER: So the philosophical  
8 discussion as to what the assumptions ought to be is  
9 sort of moot because the process of the PRA itself  
10 takes care of that if it's done thoroughly and done  
11 right.

12 MEMBER APOSTOLAKIS: One of the things  
13 that we don't do at this Committee is have  
14 presentations or briefings on the actual analysis that  
15 the industry is doing.

16 MEMBER SIEBER: Right.

17 MEMBER APOSTOLAKIS: I think that would be  
18 extremely beneficial to us if somehow we found a way  
19 to have the industry come and present a detailed PRA,  
20 fire PRA in this case. Anyway, that's a separate  
21 issue.

22 MEMBER DENNING: I think what we would  
23 like to do at this point is thank you gentlemen. And  
24 we may still ask you in the few minutes that we have  
25 left if we have some additional questions. We have

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1 the potential to hear about additional experimental  
2 work that could potentially change some perspectives,  
3 but I don't think we'll do that.

4 I think what we ought to do now is we  
5 would have some discussion while we still have the  
6 staff here and the industry here, we have some  
7 discussion? Would you agree, Graham, that we'll have  
8 some discussion here, see just kind of where we are  
9 sitting on this?

10 CHAIRMAN WALLIS: I was thinking about  
11 that. I think we certainly need discussion.

12 MEMBER SIEBER: Yes.

13 CHAIRMAN WALLIS: I think some of it needs  
14 to be in our working session, --

15 MEMBER DENNING: Yes.

16 CHAIRMAN WALLIS: -- rather than open  
17 session, but I think we can do some of it now. What  
18 little bit we can do now to clarify the situation  
19 certainly we should do now.

20 MEMBER ARMIJO: I have a question that may  
21 not be a discussion. Just in reading the staff's  
22 response to a lot of the comments received on the  
23 draft, there was reference to a lot of -- where is  
24 this thing, the screening tool, a risk screening tool,  
25 that the licensees develop a risk screening tool to be

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1 reviewed and approved by the staff.

2 This is a tool that would evaluate a  
3 variety of different multiple spurious actuations and  
4 sort them out and say, "These are the ones to worry  
5 about. And the rest we don't have to worry about."

6 What is your view? Does such a tool  
7 exist? Do you use such tools, both parties?

8 MR. MISKIEWICZ: We haven't kind of gotten  
9 to that step yet. I'm not exactly sure what the  
10 paragraph is you are referring to.

11 MEMBER ARMIJO: Yes. It's --

12 MR. MISKIEWICZ: But we can do  
13 sensitivities and say, "If I just fail the system, you  
14 know, a functional type of thing, if it's not  
15 significant, then I don't have to go down deeper and  
16 model all the individual spurious. I can screen it by  
17 saying it's not going to matter without doing the  
18 detailed modeling," you know.

19 MEMBER APOSTOLAKIS: The screening depends  
20 on a number of factors, this being one, but the other  
21 is the amount of fuel you have in your area, whether  
22 you can have a fire to begin with, the fire PRA.

23 MEMBER ARMIJO: I thought it was here is  
24 a large number of conductors that can cause spurious  
25 actuations of a large number of systems. And nobody

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1 has defined what scenarios are worrisome. It seems to  
2 me like it's a large number of mind-boggling barriers.  
3 And how do you sort those all?

4 MR. BARRETT: Let me address that.

5 MEMBER ARMIJO: Yes.

6 MR. BARRETT: One of the things that Duke  
7 has done -- and I think Progress is going to follow  
8 suit when they actually do their PRA -- is we have  
9 attempted to put our arms around the most significant  
10 multiples that we could think of by putting together  
11 an expert panel of people who know the plant, know the  
12 Appendix R design, no fire protection, and postulate  
13 these in an organized fashion, like going through  
14 PNIDs and plant design records to say, "All right.  
15 What are the real multiple spurious combinations that  
16 would really hurt me?" and capture those in scenarios  
17 so that they can be analyzed in detail in the fire PRA  
18 so that we can really look at the risk.

19 We're looking at it taking a three-pronged  
20 approach. We have the Appendix R analysis that says,  
21 "Here is all the safe shutdown stuff that I've got to  
22 have. Here are the cables and where they go in the  
23 plant. And then here is what gets damaged in each  
24 fire area."

25 And we take the expert panel. And we say,

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1 "Well, is there anything we missed? You know, is  
2 there something out there that because you end up  
3 flushing the toilet over here and you end up turning  
4 that light bulb on, the combination of things gets you  
5 something you didn't expect?" The expert panel is  
6 supposed to deal with that.

7 And then we also look at the PRA and true  
8 up all AOVs, true up all MOVs, and see if those kinds  
9 of things give us surprises that we didn't expect.  
10 Between the three of those, we think we're going to  
11 end up probably having 95 percent of the  
12 risk-significant scenarios.

13 MEMBER DENNING: For all of your plants,  
14 do you know where your cables are by tray?

15 MR. BARRETT: We didn't. We ended up  
16 having to pay to have that analysis done for us. I  
17 think it was originally determined in the '80s but was  
18 not captured in a database or anything. And we had to  
19 go back and --

20 MEMBER DENNING: But you had that for all  
21 your plants, do you?

22 MR. MISKIEWICZ: I wouldn't say all of the  
23 plants. That's a lot of work. In a lot of cases it's  
24 limited to the set of equipment that met the rule for  
25 the Appendix R compliance --

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1 MEMBER DENNING: It seems to say that --

2 MR. MISKIEWICZ: -- or our equipment that  
3 we want to credit from PRA perspective because there  
4 is risk-significant equipment in mitigation that is  
5 not within the scope of Appendix R right now. And  
6 that we'll add to the list. And some of those still  
7 need to be routed.

8 MEMBER DENNING: You do have additional  
9 cable routing that you would have to determine;  
10 whereas, you feel that you have already done the --

11 MR. BARRETT: There were some things in  
12 the PRA that we had not addressed in safe shutdown,  
13 and we're going to have to have --

14 MEMBER DENNING: Well, PRA is one thing.  
15 What about with this requirement? Does that change?  
16 Would you have to -- if this was imposed on you, do  
17 you think you have to do more cable tracing?

18 MR. BARRETT: What I'm talking about is  
19 our attempt to try to get our arms around all of the  
20 risk-significant scenarios.

21 MEMBER DENNING: Scenarios? Okay.

22 MR. BARRETT: So that's why we did the  
23 expert panel and all of that, to try to get our arms  
24 around things that we would have otherwise missed.

25 MEMBER DENNING: You keep saying

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1 "risk-significant." And we're in a space here where  
2 we're not necessarily risk-significant. It's broader  
3 than that.

4 MR. BARRETT: I think if you take all of  
5 the cables and you just fail them all and you say they  
6 all happen immediately, you're done.

7 MEMBER DENNING: You can't survive.

8 MR. BARRETT: Some of these areas you  
9 can't survive it.

10 MEMBER DENNING: Okay.

11 MEMBER SIEBER: On the other hand, from a  
12 risk standpoint, the set of cables that you have to  
13 know what the routing is becomes larger than the  
14 Appendix R set.

15 MR. BARRETT: Yes.

16 MEMBER SIEBER: But it is certainly not  
17 all of the cables. So there is going to be some  
18 physical work that has to be done if you don't have  
19 pull ticket. If you don't have the database, you  
20 can't --

21 VICE CHAIRMAN SHACK: In the NEI-001  
22 guidance, where, as I understand it, you do up to four  
23 failures, how do you select those four?

24 MR. BARRETT: A similar process with the  
25 expert panel and using Appendix R analysis, a similar

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1 process.

2 MR. FRUMKIN: This is Dan Frumkin from the  
3 staff.

4 One of the things that we have discovered  
5 about defining a failure is a lot of the analyses  
6 assume once spurious actuation, once spurious  
7 actuation, what the NEI or at least the risk, 2,403 --  
8 and I think NEI-001. They talk about multiple hot  
9 shorts.

10 Now, one pair of conductors coming  
11 together could cause numerous different spurious  
12 actuations. So I think that the staff and the --  
13 well, the staff has come out with 2,403 and has put it  
14 on the table.

15 We are looking for this hot short. That  
16 could cause whatever it could cause. We're not  
17 counting spurious actuations anymore. We're taking  
18 that hot short and saying, "Well, what could it  
19 cause?"

20 I think there was a situation where there  
21 was one cable or just a number, just a few conductors,  
22 or maybe it was even two conductors that could give an  
23 indication which could open all of 16 SRVs at one  
24 plant.

25 Now, a long time ago that might have been

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1 16 separate spurious actuations. And today we're  
2 looking at that as one pair of conductors coming  
3 together. And I think everybody is pretty much on the  
4 same page that yes, obviously if the circuits can  
5 cause all of those spurious actuations, we consider  
6 that.

7 MEMBER DENNING: Well, I guess a comment  
8 that I would have on generally what I have heard is  
9 that I think it's very clear that there are timing  
10 issues. If we go forward with the generic letter,  
11 then, at least in my interpretation of the generic  
12 letter, there are timing requirements that are not  
13 doable by the industry and that one would have to do  
14 some relaxation of that. And I don't see where just  
15 having the 30-day, where they can say, "It's going to  
16 take me longer as appropriate."

17 Now, it could be that maybe this should be  
18 more of an information-gathering generic letter,  
19 rather than one that is quite forcing the NRC's  
20 position about the need for multiple spurious  
21 actuations without a more relaxed position like NEI's.

22 I guess what I'm looking for are general  
23 comments as to people, where they are seemingly  
24 falling on this generic letter.

25 MEMBER MAYNARD: Well, I would agree with

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1 most of your comments there. First of all, I do  
2 believe that it clearly constitutes a backfit. We  
3 will get into some other things later on that, but we  
4 don't have to change regulations to be changing  
5 requirements. A change in staff position on what is  
6 acceptable for meeting a regulation, changing those  
7 position, also constitutes a backfit.

8 With that said, I would also like to say  
9 that this issue needs to be resolved. I think playing  
10 around too long about what is the right regulatory  
11 process isn't going to serve everybody's best interest  
12 either.

13 I think it is important. This issue has  
14 been around for 25 years. It needs to get resolved in  
15 an approach going forward as to what is it going to  
16 take to either make it go away as an issue or to  
17 actually fix it.

18 I think the 90 days, I think basically if  
19 it goes out the way it is, basically you're going to  
20 end up with everybody coming in with time request  
21 extensions. And so I don't think that's really the  
22 right thing to do there.

23 If it goes out the way it is, I think it  
24 needs to extend that time. I think it might be better  
25 to go out with what is truly an information request,

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1 to gather information to then be able to determine  
2 what the next steps are.

3 But, again, I don't think process should  
4 drag out for another 5 or 10 or 15, 20 years.  
5 Something needs to be done to put it on a resolution  
6 path.

7 VICE CHAIRMAN SHACK: Let me just come  
8 back to that for a second. I mean, we know what you  
9 expect from the 40 plants that are going for NFPA 805.  
10 What do you expect from the others?

11 MR. WOLFGANG: This is Bob Wolfgang again.

12 I think a number of them are going to come  
13 back and say, "We meet our licensing basis, and thank  
14 you very much. And good-bye."

15 MEMBER DENNING: Will they really say  
16 that? I mean, your --

17 MR. WOLFGANG: That is one thing.

18 VICE CHAIRMAN SHACK: Will you accept that  
19 answer?

20 MEMBER SIEBER: Send it over to  
21 enforcement.

22 MR. WOLFGANG: No. No, we won't. What we  
23 will hear from others is --

24 VICE CHAIRMAN SHACK: What would you  
25 consider an acceptable response from the others?

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1 MR. WOLFGANG: Well, "We don't address  
2 multiple spurious actuations. Here is our plan to  
3 address it to do" X, Y, Z. I don't know. "Do  
4 physical mods."

5 MEMBER DENNING: That's a six months'  
6 answer.

7 MR. WOLFGANG: Yes. That will be the  
8 six-month answer. But initially, yes, either you meet  
9 it or you don't meet it. We don't think we meet it.  
10 We think we meet it.

11 For the first round, that's all I think  
12 we're going to get.

13 MEMBER DENNING: Getting back to this  
14 backfit question, I'm not sure that ACRS is the  
15 appropriate one to answer that. Obviously it makes it  
16 easier for the regulatory staff if it's not a backfit  
17 question.

18 MEMBER BONACA: Yes. One thing that  
19 troubles me a little bit is, you know, is it a  
20 significant issue or is it not a significant issue?  
21 That's a plant-specific answer. And so we're not  
22 going to find out an answer to the question.

23 And I think that if we had to perform a  
24 generic evaluation to justify a backfit, I'm not sure  
25 that it could be done because, I mean, it's so

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1 specific to the plant, the age, to whatever the  
2 situation may be.

3 MEMBER DENNING: But this question of a  
4 specific issue, I think you can do a reduced analysis  
5 to determine. I think you can screen out stuff a  
6 priori --

7 MEMBER BONACA: I think so, too.

8 MEMBER DENNING: -- you know, so that it  
9 isn't such an onerous job to determine what's  
10 important and what's a potentially significant risk  
11 contributor here.

12 MEMBER BONACA: Clearly, I mean, something  
13 has to be done. I mean, we have new evidence in front  
14 of us. And I completely agree with you, Otto, that it  
15 can't wait. They have to be dealt with.

16 I think that, however, the industry needs  
17 more time to deal with this. They don't have a  
18 ready-made process by which they can screen this out  
19 and address it. So the issue is more the time.

20 Now, the next statement again, as reported  
21 to you, is the fact that we are not really the best  
22 charges of what is the most appropriate regulatory  
23 process to follow to go ahead with this.

24 MEMBER APOSTOLAKIS: Our job here is to  
25 judge the generic letter as presented to us.

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1 MEMBER BONACA: Yes.

2 CHAIRMAN WALLIS: I am just wondering how  
3 we add value to this. If we were a subcommittee, we  
4 might well say, "Look, we now know what the issues  
5 are. We think there must be a better way than having  
6 the agency send out this generic letter asking for  
7 things which may be impractical for some plants," but,  
8 then, there should be some way to work with the plants  
9 to figure out what is the right solution to this  
10 technical problem. I'm not sure.

11 We're also sort of a facilitator between  
12 industry and the agency, and that's not really our  
13 job, though, is it?

14 MEMBER SIEBER: Well, the other thing that  
15 is not our job is to try to figure out whether it's a  
16 backfit or not. That's a legal question.

17 CHAIRMAN WALLIS: Well, we don't even know  
18 how important it is because we don't have these proper  
19 risk analyses.

20 MEMBER DENNING: Well, having resolved  
21 these questions, I now turn it back to you, Mr.  
22 Chairman.

23 (Laughter.)

24 CHAIRMAN WALLIS: I can make a very  
25 decision, which is to take a break for lunch. We are

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1 going to be ethics-trained at 12:15. And then we go  
2 to work again at 1:30. Thank you very much for your  
3 presentations.

4 We'll take a break, and as a Committee,  
5 we're going to be back here, not on the transcripts or  
6 anything, for ethics training at 12:15. We'll start  
7 the official proceedings again at 1:30.

8 (Whereupon, a luncheon recess was taken  
9 at 11:33 a.m.)

A-F-T-E-R-N-O-O-N S-E-S-S-I-O-N

(1:33 p.m.)

CHAIRMAN WALLIS: Back into session. The next item on the agenda is another generic letter; first of all, underground cable failures that disable accident mitigation systems.

Our cognizant member is Mario Bonaca. I will hand over the meeting to him. Please go ahead, Mario.

MEMBER BONACA: Thank you, Mr. Chairman.

3) DRAFT FINAL GENERIC LETTER 2006-XX,

"INACCESSIBLE OR UNDERGROUND CABLE FAILURES THAT  
DISABLE ACCIDENT MITIGATION SYSTEMS"

3.1) REMARKS BY THE SUBCOMMITTEE CHAIRMAN

MEMBER BONACA: We have a presentation from the staff. They are proposing to issue a generic letter on inaccessible underground cable failures that disable accident mitigation systems.

We have recently become conversant with this issue through license renewal. You may remember that the GALL report requires for license renewal the existence of two programs: one, a program to detect the presence of water and the watering actions; and the other one is a program to test the cables and essentially-- so we are aware of the concern here.

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1 And the staff is now addressing this issue in the  
2 current licensing area.

3 And so, with that, I will turn to the  
4 staff. Mr. Mayfield?

5 3.2) BRIEFING BY AND DISCUSSIONS WITH  
6 REPRESENTATIVES OF THE NRC STAFF

7 MR. MAYFIELD: Good afternoon. I'm Mike  
8 Mayfield, the Director of the Division of Engineering.  
9 And my division is sponsoring this generic letter.

10 We're here this afternoon to seek ACRS  
11 endorsement to publish the generic letter. The  
12 generic letter, as Mr. Koshy will describe, provides  
13 some information to licensees on the significance of  
14 these potential failures, and seeks some information  
15 from licensees regarding the monitoring of these  
16 cables.

17 Tom Koshy from the Electrical Engineering  
18 Branch will make the presentation.

19 MR. KOSHY: Thank you, Mike.

20 As Dr. Bonaca mentioned to you, this was  
21 first brought to your attention as a problem during  
22 the license renewal hearing at the ACRS. The question  
23 was, is dewatering every ten years going to prevent  
24 the problem?

25 At that time, in light of the failures

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1 that we had noticed at the time, we thought of taking  
2 it as an operating reactor issue under Part 50. And  
3 we did some serious looking into see how big the  
4 problems are.

5 The safety concerns identified at the time  
6 were some of these underground and inaccessible cables  
7 supply power to some safety-related components. Using  
8 some examples here, the off-site power, the cable that  
9 brings the off-site power, to the safety buses.

10 The second would be the emergency diesel  
11 generator feeder. This is critical in those cases  
12 where the emergency diesel generator to building is  
13 physical apart from the main building so that the  
14 underground cables bring into power; and then the  
15 emergency service water pumps, these cases where the  
16 pump house is located again, you know, physically away  
17 from the plant so that the power supply to the service  
18 water pump has to go through underground cables.

19 And failure of one of these cables could  
20 affect multiple systems in these sense there could be  
21 a train, cooling off of safety systems, collectively  
22 influencing more than just one isolated system.

23 Most of these failures that we came across  
24 did not have any direct reference to having a  
25 qualification for this cable to withstand the moisture

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1 environment or, essentially, you know, in duct banks,  
2 if it is immersed in water, you know, can it  
3 withstand. That type of qualification had not been in  
4 existence for these cables that we came across.

5 MEMBER BONACA: Let me understand now,  
6 however. These are cables in safety-related  
7 applications?

8 MR. KOSHY: Yes.

9 MEMBER BONACA: Okay. So evidently on day  
10 one, when the plant was built, there was no  
11 expectation that the cable would be wetted?

12 MR. KOSHY: Yes. In fact, they thought it  
13 would stay relatively dry, but as duct banks develop  
14 cracks, you know, there would be traffic about it.  
15 And eventually these things crack. And depending on  
16 the water table, you know, it could be immersed for a  
17 long time or maybe a short time.

18 MEMBER BONACA: Well, in many cases, these  
19 cables are buried --

20 MR. KOSHY: Yes.

21 MEMBER BONACA: -- in the ground. So from  
22 day one, there was an expectation that they would see  
23 humidity and why we are not environmentally qualified.

24 MR. KOSHY: Either it was not specified at  
25 the time or they thought that, you know, the existing

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1 material at the time could withstand some level of  
2 moisture. For some reason, they did not specifically  
3 seek out.

4 The reason I stated that is, you know,  
5 much in the later period, now we have cables that can  
6 withstand such highly moist environment. In fact, I  
7 know of a case where they have run the cable to the  
8 river. That's for a --

9 CHAIRMAN WALLIS: But not forever.

10 MR. KOSHY: Excuse me?

11 CHAIRMAN WALLIS: Just because they are  
12 qualified doesn't mean they will survive forever in  
13 this environment.

14 MR. KOSHY: You are right, yes. Yes.  
15 They may not survive forever, but at least, you know,  
16 they have some demonstrated capability for a certain  
17 period that it can be even immersed in water and still  
18 do its function.

19 But all of that addresses, you know, the  
20 possibility that you need to know the condition of the  
21 insulation so that you have that confidence that it  
22 can do its function for the foreseeable future.

23 We went back into the history of the LERs  
24 that we have on record. We saw failure at 17 sites  
25 and cable replacements at 100 or so. And most of the

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1 faulty cables were not discovered until there was an  
2 operational failure.

3 Again, these are based on LERs, where the  
4 system has a redundant system or some reason, because  
5 of a plant trip or the failure was serious enough it  
6 prompted an LER.

7 MEMBER ARMIJO: What is your definition of  
8 a medium cable?

9 MR. KOSHY: 5 kV.

10 MEMBER ARMIJO: And above?

11 MR. KOSHY: 5 kV. Well, in the sense of  
12 when you go into 13 kV, you know, some people label it  
13 as medium also.

14 MEMBER ARMIJO: Okay.

15 CHAIRMAN WALLIS: High tension.

16 MEMBER SIEBER: Four-eighty volts to --

17 MR. KOSHY: Four-eighty will be below  
18 that. Yes. We will not call that medium, yes.

19 MEMBER SIEBER: Four-eighty is --

20 MEMBER BONACA: But you include those?

21 MR. KOSHY: Excuse me?

22 MEMBER BONACA: But you include those in  
23 the --

24 MR. KOSHY: Yes, we are including those  
25 because there are certain plants where the emergency

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1 diesel generator generates voltage at 480 and  
2 emergency service water and safety pumps are at 480  
3 volts, some small plants and early vintage.

4 MEMBER BONACA: Okay.

5 MR. KOSHY: So we wanted to include that  
6 also. That's why we went more than just medium  
7 voltage.

8 The EPRI data indicated about 65 cable  
9 failures. And later the white paper which NEI has  
10 submitted indicated about 55 failures for about 15  
11 plants.

12 Most of the cable failures have what in  
13 common? It's about 12 years of age. And the cable  
14 was subjected to some type of, you know, moisture  
15 environment, probably for a longer duration or a  
16 shorter duration. And these things were essentially  
17 common factors.

18 The cables, again, that we are focusing on  
19 is about roughly about six to eight cables, you know,  
20 depending on the design uniqueness, the cables that  
21 can have the most, let's say, significant impact on  
22 the plant.

23 MEMBER MAYNARD: The cable was about 12  
24 years old? You're saying that all of these failures  
25 were about the same age or --

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1 MR. KOSHY: No. More than that. There  
2 are some 20-plus.

3 MEMBER MAYNARD: Okay. All right.

4 MR. KOSHY: Yes.

5 CHAIRMAN WALLIS: It was at least 12 years  
6 old. At least 12 years. I was trying to figure it  
7 out. If it's every 12 years, that's pretty severe.

8 MR. KOSHY: You're right. Twelve and  
9 above. So in this generic letter, what we are  
10 focusing on is power cables that are within the scope  
11 of the maintenance rule, including cables connected to  
12 off-site power, emergency service water, and the other  
13 examples that I stated before, and those routed  
14 through underground or inaccessible locations, such as  
15 buried conduits, cable troughs, above-ground and  
16 underground. And these are the things that we are  
17 considering to be within the scope of this generic  
18 letter.

19 The benefits of this program are gaining  
20 confidence in the capability of the cable to respond  
21 to design bases events. To give you an example, at  
22 Turkey Point after the hurricane, the diesel had to  
23 run for about a week continuously. And thereafter for  
24 a month's period, the diesel had to come back on for  
25 other spurious power outages.

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1           So if you are looking into an accident  
2 where it has to be on a LOOP condition where these  
3 cables may need to be relied on for a few weeks. So  
4 we are not looking at a few hours of operation. The  
5 confidence needs to be gained for a period much higher  
6 than a few hours, which is usually the subject of our  
7 maintenance and surveillance activities.

8           MEMBER BONACA: Do you have examples of  
9 failures in service that were not exhibited during  
10 functional testing?

11           MR. KOSHY: What we have, the reported  
12 failures are a combination of both. Some in-service  
13 failures certain plants appear to have more than  
14 others. And others, when you start for surveillance,  
15 you find out that, you know, after a couple of hours,  
16 it fails.

17           So the LERs that we recorded are those  
18 cases where the plant impact was significant, so in  
19 the sense either operational. And if it is purely  
20 during a surveillance, we will not get an LER report  
21 on it.

22           So that's some of the problem that we are  
23 facing. The LERs that we received are so limited in  
24 number because, you know, it had to either bring a  
25 plant down or give an easy access situation for us to

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1 plant an LER report.

2 So that's why we are focusing on getting  
3 a handle on the extent of failures so we can engage  
4 them and see what other actions would be necessary.

5 CHAIRMAN WALLIS: Could you explain  
6 something to me?

7 MR. KOSHY: Yes.

8 CHAIRMAN WALLIS: I can understand  
9 off-site power sort of coming in on the underground  
10 cable. Why is diesel generator? Why does the diesel  
11 generator have underground cables? Is it part of the  
12 plant?

13 MR. KOSHY: Yes. For example, in some  
14 plants, the building is a separate building.

15 CHAIRMAN WALLIS: It's in a separate  
16 building. It's in a separate building.

17 MR. KOSHY: Yes. For example --

18 CHAIRMAN WALLIS: Okay.

19 MR. KOSHY: -- they have separate  
20 building.

21 CHAIRMAN WALLIS: They might be in a  
22 separate building?

23 MR. KOSHY: Yes.

24 CHAIRMAN WALLIS: That's very different  
25 from, say, something that comes from off-site power,

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1 where the cable may be a long cable from --

2 MR. KOSHY: Yes. That will be  
3 significantly longer. That will be from the  
4 switchyard. In some cases, you will have a situation  
5 closer to the plant, where you bring down to 13 kV or  
6 so.

7 CHAIRMAN WALLIS: Okay. Thank you.

8 MR. KOSHY: The next benefit is we can  
9 prevent the unanticipated failures that cause plant  
10 transients by using the maintenance rule as the scope.  
11 We are also looking at challenges to the plant in the  
12 sense of what will give you a plant transient. So  
13 that is what is seen as the scope of this generic  
14 letter.

15 The next is you can use a convenient  
16 outage if you know the rate of degradation. Rather  
17 than taking, you know, unwarranted outages, you can  
18 schedule that cable replacement for a convenient  
19 refueling outage and do the replacement with minimum  
20 interruption.

21 CHAIRMAN WALLIS: Are these cables usually  
22 designed so they can easily be pulled through to  
23 repair them?

24 MR. KOSHY: No. It is very  
25 time-consuming, most of the --

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1 CHAIRMAN WALLIS: There's not a big duct  
2 in the cable and you just drag through a new cable?

3 MR. KOSHY: No.

4 CHAIRMAN WALLIS: No? You have to take it  
5 out? You have to dig it up?

6 MEMBER SIEBER: It's the whole thing. No.

7 MR. KOSHY: Well, pull-through is there,  
8 but the thing is it has a lot of staging. And you  
9 have energized equipment on both sides. So you need  
10 to essentially take some bus outages. So it is  
11 significantly time-consuming.

12 CHAIRMAN WALLIS: Yes, but you don't have  
13 to dig it out?

14 MR. KOSHY: Unless it is direct buried  
15 cable.

16 MEMBER BONACA: In fact, I mean, for  
17 example, yesterday during the review of Monticello,  
18 the majority of their underground cable, they're  
19 buried.

20 CHAIRMAN WALLIS: Those are usually  
21 utility duct or something, in other words.

22 VICE CHAIRMAN SHACK: This is direct  
23 buried.

24 CHAIRMAN WALLIS: Direct buried cable?

25 MR. KOSHY: Those are not exceptions.

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1 Usually you will have a duct bank with some sleeves in  
2 there so that you can pull through it.

3 MEMBER BONACA: And it depends on the age  
4 of the plant. I mean, Monticello is an older plant.  
5 They buried it, and that was it.

6 MR. KOSHY: So you have a wide variety on  
7 those?

8 MR. MORRIS: Tom, George Morris, EEEB.  
9 Some of the original cables that were pulled through  
10 duct bank, all of the original cables that were pulled  
11 through duct bank, were pulled through with the use of  
12 cable lubricant to reduce the friction. After they  
13 had been in there for a while, that lubricant has  
14 dried up.

15 MEMBER BONACA: It doesn't work.

16 MR. MORRIS: In some cases, it's almost  
17 like concrete.

18 MR. KOSHY: Okay. Moving on to some  
19 examples, Ocone is a success story where they found  
20 that two of the six cables had significant  
21 degradation. And they were able to monitor it and  
22 take the outage at a convenient time so that they can  
23 replace them.

24 Another example I am using here is Peach  
25 Bottom. When they experienced a failure, they decided

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1 to make a global replacement. You know, they didn't  
2 want to do any testing at all. And that's also a  
3 solution.

4 CHAIRMAN WALLIS: Now, is it always water  
5 that leads to degraded cables? It seems to me that  
6 you could have a cable and a duct which might just --  
7 you know, the insulation can over a period of time  
8 oxide or whatever it does. I mean, even in your house  
9 without water, you get cables that --

10 MR. KOSHY: Yes.

11 CHAIRMAN WALLIS: The insulation cracks  
12 and so on.

13 MR. KOSHY: This has some influence in the  
14 sense if it is a dry insulation and there is only  
15 cracks, chances are it will survive a little longer.

16 CHAIRMAN WALLIS: That's right, but it may  
17 --

18 MR. KOSHY: The presence of chemicals --

19 CHAIRMAN WALLIS: Makes it work.

20 MR. KOSHY: -- create default.

21 CHAIRMAN WALLIS: It's not essential that  
22 you have moisture, is it?

23 MR. KOSHY: Right. You're right. We are  
24 not trying to look at the root cause of what causes  
25 the failure. We are more interested in seeing,

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1       irrespective of the causes, let's have a program in  
2       place so that we can prevent such unanticipated  
3       failures and have a great confidence in the accident  
4       mitigation capability. So that's the focus we are  
5       trying to get because for --

6                   CHAIRMAN WALLIS: There is no routine  
7       measurement of, say, resistance of ground of a cable?  
8       There is no routine --

9                   MR. KOSHY: There is some technology  
10      developing that way, but online systems have not been  
11      doing that well. I think the industry is headed that  
12      way and there is some aggressive effort in the  
13      industry for coming up with something like that or,  
14      rather, building confidence in the systems that are  
15      now under development.

16                   Oyster Creek is an example where they  
17      replaced the cables and they had few repeated  
18      failures. This design is also unique. They  
19      essentially had this cable going about 200 feet away  
20      from the main plant as an extension of the safety bus.  
21      And this is remaining energized all the time. And  
22      that earlier had several failures.

23                   So the information that we are requesting  
24      is provide to us a history of the cable failures in  
25      the scope that I discussed just before and a

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1 description and frequency of the inspection, testing,  
2 and the monitoring programs in place. And if you do  
3 not have a monitoring program in place, explain to us  
4 why such a program is not necessary. So that is  
5 essentially what we are asking in --

6 CHAIRMAN WALLIS: So this is really  
7 information gathering. This isn't requiring an  
8 action?

9 MR. KOSHY: Right, right.

10 VICE CHAIRMAN SHACK: Now, are you  
11 distinguishing between a monitoring program and a  
12 functional testing program here?

13 MR. KOSHY: Okay. The explanation that we  
14 have given, in fact, I am addressing as a response to  
15 a public comment, what we are saying is the functional  
16 testing that you do that you energize for a short  
17 period doesn't give you any confidence that it will do  
18 it again.

19 VICE CHAIRMAN SHACK: Okay. So you're not  
20 counting that as a monitoring program?

21 MR. KOSHY: Yes. We are not.

22 MEMBER SIEBER: A surveillance test.

23 MR. KOSHY: These are the organizations  
24 that have given response to the first version that  
25 went out for public comments. And I will address the

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1 highlights of how we addressed those comments.

2 Cable failures are random. And,  
3 therefore, no NRC action is required.

4 CHAIRMAN WALLIS: It sounds like saying  
5 they're an act of God or something.

6 MR. KOSHY: Yes. We just explained the  
7 surveillance activity, which wouldn't give you  
8 confidence on its future performance. You need to in  
9 some way monitor the condition of that insulation so  
10 that we can build that confidence.

11 Again, you know, this is the small group  
12 of cable where you have this problem. Otherwise, the  
13 rest of the cable is in a dry environment. Next to  
14 selectable sealed-in concrete, you know, these cables  
15 should be the most reliable piece of equipment in a  
16 plant, you know, should not be failing for about 40  
17 years or, in fact, for 60 years, you know, if it is  
18 the environment and the conditions are right.

19 And I quickly explained before that the  
20 low-voltage cables are included because some of the  
21 early vintage plants have this 480-volt equipment for  
22 safety buses, diesel, and naturalized emergency  
23 service water, and service water equipment.

24 CHAIRMAN WALLIS: The original sentence is  
25 garbled. It doesn't matter. Essentially we have a

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1 period after impact, and that's all right. Scope is  
2 limited.

3 MR. KOSHY: Okay. Again, we just  
4 addressed this issue, why this basic surveillance  
5 tests of operating for a half an hour or two hours  
6 wouldn't be sufficient to gain that confidence for --

7 CHAIRMAN WALLIS: What you do is you put  
8 on them the voltage that they would have in operations  
9 and --

10 MR. KOSHY: No. You actually energize a  
11 --

12 CHAIRMAN WALLIS: Do you actually have to  
13 have current going? Do you have to current going  
14 through these cables to test them or does it have the  
15 voltage applied to them and see if there's a leakage?

16 MR. KOSHY: Yes. There are about eight or  
17 ten techniques in the industry.

18 CHAIRMAN WALLIS: There's a whole lot of  
19 techniques.

20 MR. KOSHY: Yes, yes. And the thing is  
21 the early technique was just apply very high voltage  
22 and make it fail. That was the most crude way of  
23 doing it.

24 MEMBER SIEBER: Meggering.

25 MR. KOSHY: Meggering is another method,

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1 but that has certain weaknesses, too.

2 MEMBER SIEBER: You have reflective  
3 techniques.

4 MR. KOSHY: Yes. Time domain reflects  
5 III, and about six or eight techniques are there. And  
6 there are still some under development. Collectively  
7 you have about two IEEE standards that go into details  
8 of the type of tests available and the level of  
9 confidence that you have based on the type of cable.

10 So depending on if you have a shield and  
11 what kind of shield and what type of rubber material  
12 is used, the level of confidence is different, you  
13 know, depending on the type of test that you do.

14 So there is some industry that two IEEE  
15 standards are available to address that and which one  
16 is better and which one is desired.

17 MEMBER SIEBER: You can get some pretty  
18 high voltages in these cables from switching  
19 transients.

20 MR. KOSHY: That's true.

21 MEMBER SIEBER: It will go well beyond the  
22 rating for a very brief period of time. And sometimes  
23 that's when the insulation fails.

24 MR. KOSHY: Yes.

25 MEMBER BONACA: By "surveillance test,"

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1 you mean surveillance of the equipment and this power  
2 by the cable?

3 MR. KOSHY: Right. You are giving normal  
4 voltage and normal function of a couple of hours, you  
5 know, like in the pump in service inspection or type  
6 of surveillance you will expect to run in for two or  
7 three hours, make sure it is for using the rate of  
8 flow and things like that. That's the type of test  
9 that will not give you a feeling of how good the  
10 insulation is. Will it last for the next two weeks of  
11 runoff?

12 The regulatory basis for our cable  
13 monitoring is we have added that what is seen in bold,  
14 that condition is something that we really did not  
15 have in the first version. And we are essentially  
16 saying that "assess the continuity of the systems and  
17 the condition of the components." So you need to know  
18 the condition of this insulation so that we can have  
19 that confidence on its performance.

20 MEMBER ARMIJO: Could you expand that?  
21 Condition based on electrical properties? Are you  
22 actually looking for physical condition? They're in  
23 accessible.

24 MR. KOSHY: These are inaccessible, but  
25 you do have state-of-the-art techniques available in

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1 electrical testing which will measure the testing of  
2 the insulation.

3 MEMBER ARMIJO: Okay.

4 MR. KOSHY: So if you can establish that  
5 the integrity of the insulation is reasonable, then  
6 you have that confidence that it will not fail in the  
7 most probable cases.

8 MEMBER ARMIJO: Thank you.

9 MR. KOSHY: The question was regarding  
10 multiple cable failures. The only example that we  
11 have collected in light of our efforts is a case where  
12 one insulation failure was in the circulating water  
13 pump, resulted in taking two other substations out  
14 with it.

15 The possibility that we are talking of is  
16 the fault itself causes a transient and sends some  
17 transient current. And if you have some near-failure  
18 equipment, that can be a cause for additional  
19 failures. You know, these are speculative problems.  
20 And this is the only example that we have on record  
21 for that.

22 Now, the modifications that we have done  
23 in light of the comments on this are editorial in  
24 nature, a good part. We revised the scope to include  
25 the above-ground and below-ground duct banks; removed

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1 the broadband spectroscopy because that's not a proven  
2 technique yet, but, again, that could be a technique  
3 available in the future; revised the requested  
4 information to include the type of service so that we  
5 will be able to know if there are repeated failures in  
6 a certain area. And we revised the data collection  
7 time to 60 hours.

8 CHAIRMAN WALLIS: So it would seem that  
9 there is still a gap between your view and the  
10 industry's view.

11 MR. KOSHY: Yes.

12 CHAIRMAN WALLIS: The industry had some  
13 pretty strong comments. And your modifications don't  
14 reflect large changes in response to their comments.

15 MEMBER SIEBER: Right.

16 CHAIRMAN WALLIS: So there would seem to  
17 be still a big gap between your view and the  
18 industry's view. Is that true?

19 MR. KOSHY: I will address that in the  
20 next slides along with the NEI white paper issues, in  
21 slides 16 and 17.

22 CHAIRMAN WALLIS: Okay.

23 MR. KOSHY: We presented this to CRGR.  
24 And CRGR asked us to do two improvements on the  
25 generic letter: to bring the focus on the power

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1 cables itself and also to add a safety-related example  
2 to show the significance of this failure on a plant.  
3 In the package that you have received, we have  
4 incorporated those changes.

5 We received the NEI white paper much after  
6 the comment period on May 1st. I have addressed the  
7 highlights in this coming couple of slides. One is a  
8 graded approach. Again, the number that you see on  
9 the top is the sections that correspond to the NEI  
10 white paper, 6.6.

11 The graded approach for monitoring and  
12 replacement of cables, the bullets are many cables do  
13 not power safety-related equipment; and the other one,  
14 graded approach to replacement and monitoring is best  
15 for safety and business reasons.

16 Our response is that we are only focusing  
17 on those that are significant. That's the very reason  
18 that we are using to bring the scope down to the  
19 maintenance rule. And we mentioned certain systems in  
20 there because to, let's say, overcome the variances  
21 and interpretations on that rule and also because  
22 those examples that we state there are the ones that  
23 have most impact on the plant in the sense affecting  
24 multiple systems.

25 Therefore, these are classified as most

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1 important because of these reasons. And, therefore,  
2 you know, it will be important to prevent the  
3 transients and also in supporting of mitigating the  
4 accident.

5 So that's how we have narrowed the scope  
6 and as to bringing down to only important cables and  
7 not all of the cables at large. And the numbers that  
8 you see in that white paper are some plants have like  
9 300-plus cables. And that won't be within the scope  
10 of maintenance rule.

11 The next one, the recommendations again in  
12 chapter 8, is provide dry environment, prepare for  
13 cable failures, and share failure resolutions.

14 Providing a dry environment -- again, you  
15 know, these are all installed cables. It's not quite  
16 practical. And pumping out would help. It will slow  
17 down the failure, but it cannot prevent the failure.  
18 It may take a little longer. And these cable failures  
19 could affect many systems. And the replacement of  
20 these cables is very time-consuming.

21 So if you have a valid accident mitigation  
22 method and at that time trying to make this cable  
23 replacement could be very difficult because the cables  
24 that run in the same duct banks could be helping the  
25 accident mitigation at that time. And your cable

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1 pulling and taking bus outages would not be desirable  
2 actions when you run into an accident environment or  
3 facing a LOOP or a station blackout.

4 And the technique is available there to  
5 have that reasonable confidence so that we can rely on  
6 these cables for continued operation.

7 That's all we have prepared for presenting  
8 to you. And if you have --

9 MEMBER BONACA: I have a question --

10 MR. KOSHY: Sure.

11 MEMBER BONACA: -- regarding in the  
12 generic letter, you talk about 23 LERs --

13 MR. KOSHY: Right.

14 MEMBER BONACA: -- and two monitor  
15 reports. Then the letter says that you believe that  
16 this is a very small fraction. That is the word used  
17 in the LER in the generic letter, a very small  
18 fraction of the actual failure to take place, which  
19 tells me that the number of failures that happen may  
20 be in the hundreds.

21 What is the projection? What does it mean  
22 that 25 in total is a very small fraction?

23 MR. KOSHY: It's very difficult to make  
24 such an estimate, but let me give a personal  
25 experience that I know of. I was at an AIT for a

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1 plant where they had such a cable failure. At that  
2 time they had six cable failures already when we had  
3 the AIT in the mid '80s. So that is repeated failures  
4 happening at one plant.

5 MEMBER BONACA: Okay.

6 MR. KOSHY: Again, I know of another  
7 Northeastern plant where they have all of these  
8 service water cable and emergency service water cables  
9 going through manholes. And they had splices in that  
10 also. And this manhole gets filled with water. And  
11 when the manhole cover knocks out, that's when you  
12 find out the splice failed. They had also quite  
13 repeated failures.

14 So certain plants may have a higher  
15 susceptibility because of groundwater and the design  
16 uniqueness. There may be some plants in absolutely  
17 dry environment, like WNP 2 in the middle of the  
18 desert. They may not have any cable problems because  
19 it's always dry. and if it all drains, it dries out  
20 so fast. So some plants may be fully exempt from this  
21 problem.

22 If the water table is a guide, those are  
23 the ones where you have high susceptibility and  
24 failures. And some plants are kind of glaringly  
25 different than others.

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1                   MEMBER BONACA: The information you are  
2 requesting is regarding all cables, right, not only  
3 those in a weather condition?

4                   MR. KOSHY: All cables and inaccessible.

5                   MEMBER BONACA: Inaccessible.

6                   MR. KOSHY: Yes.

7                   MEMBER BONACA: Exactly. Okay.

8                   MR. KOSHY: So plants where they did not  
9 have failures would not have anything to report. But  
10 if you had failures, we would like to know them --

11                   MEMBER BONACA: Yes.

12                   MR. KOSHY: -- so that we can kind of  
13 gauge, you know, are there repeated problems, what are  
14 the vulnerabilities, and based on that probably share  
15 the lessons and see if you have to take further  
16 action. Maybe it's down to a few plants. We do not  
17 know that because we lack the data to support that.

18                   And the NEI white paper data shows about  
19 15 plants having about 45 to 50 failures. That could  
20 be an indication because they focused on underground  
21 and medium voltage only.

22                   MEMBER BONACA: But your monitoring  
23 program that you're talking about doesn't deal only  
24 with cables that failed. It deals with cable aging  
25 that may be operable during functional testing that

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1 failed during demand, service.

2 So how are you going to gather information  
3 regarding these kind of cables?

4 MR. KOSHY: Okay. What we are saying is  
5 if those cables are within the scope of maintenance --

6 MEMBER BONACA: Yes.

7 MR. KOSHY: -- and they're underground and  
8 inaccessible, tell us if you have failures. And do  
9 you have a program when they have this susceptibility  
10 for failure to make sure that it wouldn't fail?

11 MEMBER BONACA: I understand.

12 MR. KOSHY: So you're not on the scope.  
13 Tell us what the failure is. And see how you monitor.

14 MEMBER BONACA: Right.

15 MEMBER ARMIJO: I have a question. How  
16 can you have a failure of above-ground inaccessible  
17 cable without water? Is it --

18 MR. KOSHY: Okay. What happens is, you  
19 know, even in some large conduit connections which go  
20 on the surface because of the variance, you get  
21 condensation built in there unless you have a way of  
22 venting it out.

23 MEMBER ARMIJO: Well, it could be a  
24 significant amount of water.

25 MR. KOSHY: You could collect all the

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1 time.

2 CHAIRMAN WALLIS: You get a humid day and  
3 a cold night.

4 MR. KOSHY: For the condensation and --

5 MEMBER SIEBER: You can get cable failures  
6 from things other than water.

7 MR. KOSHY: Yes, other chemicals and other  
8 leeching, yes.

9 MEMBER SIEBER: Chemicals, overheating.  
10 You know, that degrades insulation or defect in  
11 splices, for example, if --

12 MR. KOSHY: Yes. Splices is another  
13 vulnerable point.

14 MEMBER SIEBER: It's handmade.

15 MEMBER MAYNARD: A couple of questions.  
16 On the provided inscription of the frequency of all  
17 inspection testing, monitoring, are you talking about  
18 what is currently in place or are you asking the  
19 licensee to go back to day one for all of what testing  
20 has been done?

21 MR. KOSHY: We are asking for what you  
22 have in place now so that you can put in place such  
23 unanticipated failures.

24 MEMBER MAYNARD: Okay. And the other  
25 thing is, is the staff coordinating in any way? This

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1 is requesting this information to be within 90 days.

2 MR. KOSHY: Right.

3 MEMBER MAYNARD: And it would appear to me  
4 that if the other generic letter on the spurious  
5 actuation gets issued, a lot of the same resources  
6 could be required or needed for a lot of these  
7 activities, both dealing with electrical circuits,  
8 just --

9 MEMBER SIEBER: This one is pretty --

10 MR. KOSHY: We will work with the Generic  
11 Communications Division so that we would be sensitive  
12 to that.

13 CHAIRMAN WALLIS: So what are you going  
14 with the information when you get it?

15 MR. KOSHY: What we are hoping is that  
16 depending on, let's say, the breadth and depth of the  
17 problem as to why widespread, we may have to think of  
18 NRC action if that warrants it. We have --

19 CHAIRMAN WALLIS: You think that there  
20 might be some problem. You have this sort of you  
21 almost call it a fishing expedition, where you get all  
22 of this information. And then you look at it and say,  
23 "Aha. Now we have to do something or not." You're  
24 not quite sure what you are going to find.

25 MR. KOSHY: Okay. We know it is a

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1 significant problem in the light of what I explained  
2 to you.

3 CHAIRMAN WALLIS: There have been events,  
4 right.

5 MR. KOSHY: Yes. We have been having  
6 events, which either the plant is out or disabled  
7 safety systems. And those things kind of give you a  
8 flavor of significance.

9 CHAIRMAN WALLIS: But the result of all of  
10 this information gathering might be that you decide  
11 everything is okay as it is now.

12 MR. KOSHY: If the industry has, let's  
13 say, commitments to prevent such failures, yes. But  
14 if you are seeing failures and repeated failures, we  
15 have to rethink what we should be doing. Okay? We  
16 are not there yet. We need to --

17 MR. MAYFIELD: Professor Wallis, this is  
18 Mike Mayfield from the staff. As we assess the  
19 results we get back from this, we would have to make  
20 a decision whether generic action is warranted or is  
21 there some plant-specific action that is warranted or  
22 things are being managed appropriately as it is. And  
23 we just don't know until we get the results back. We  
24 have enough indicators to make us believe that we need  
25 to go --

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1 CHAIRMAN WALLIS: I think the industry  
2 response to the public comments was everything is  
3 fine, we're doing the right thing now. You just want  
4 the assurance that it really is so.

5 MR. MAYFIELD: That might be the outcome.  
6 And we'll have to see what actually comes in.

7 MEMBER SIEBER: The third question sort of  
8 tips your hand as to what you want. And it says if a  
9 monitoring or surveillance program is not in place,  
10 explain why such a program is not necessary.

11 In other words, here's a plant with  
12 failures. And they're not testing anything.

13 MR. MAYFIELD: We might want to chat with  
14 them a bit.

15 MEMBER SIEBER: You gave them the hint.  
16 You ought to test something.

17 MEMBER BONACA: Or you may have a plant  
18 where there have been no failures and you have no  
19 significant power equipment. Then why should you even  
20 have a test? I mean, then you have a threshold for  
21 saying, "We don't need it."

22 MEMBER MAYNARD: I've got a feeling when  
23 you get all of this, the actual number of failures if  
24 you divide it by the number of plants and the number  
25 of operating years wouldn't look that great, but when

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1 you go to group them, there may be some areas where  
2 you --

3 MR. MAYFIELD: Exactly. And that is not  
4 an uncommon outcome from getting this kind of  
5 information.

6 MR. KOSHY: One thing you find out is the  
7 data that we have at this time is based on normal run  
8 and surveillances, not an extended use of like two,  
9 three weeks. So what we are trying to see is gain  
10 confidence that these cables can continue in service  
11 for two or three weeks if there is a station blackout  
12 or some reason and we can continue to rely on these  
13 cables for that safety function.

14 MEMBER BONACA: Yes. That is a very  
15 important issue, you know, the failure to run. So the  
16 equipment starts, but then it won't run for as long as  
17 it has to. And that's trickier because, I mean, the  
18 number of failures experienced to date doesn't give  
19 you a specific insight on these cables. And that's  
20 their function.

21 MR. KOSHY: Right.

22 MEMBER BONACA: Any additional questions?

23 (No response.)

24 MEMBER BONACA: If not, I thank you for  
25 the presentation.

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1 MR. KOSHY: Thank you.

2 MEMBER BONACA: I think Mr. Marrison of NEI

3 --

4 MR. MARRION: Yes.

5 MEMBER BONACA: -- would like to make a  
6 statement. NEI, of course, produced that white paper  
7 that is quite interesting on this issue.

8 MR. MARRION: Good afternoon. I'm Alex  
9 Marrison, the Senior Director of Engineering at NEI.

10 I do have a couple of comments I want to  
11 make about basically what we heard. We haven't seen  
12 the staff disposition of the public comments that have  
13 been submitted. Nor have we seen the current version  
14 of the proposed generic letter.

15 But I have to tell you I am confused. And  
16 the reason for that confusion is that a couple of  
17 years ago, I received a letter from the Electric  
18 Systems Branch Chief articulating concern with a  
19 potential common mode of medium voltage cables. And  
20 the common mode failure mechanism was water training.  
21 This was based upon a review of 20-some odd licensee  
22 event reports.

23 We had a public meeting with the staff to  
24 understand, get a little more of an understanding of,  
25 their concerns. And we looked into the licensee event

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1 reports, and they had -- I'm trying to remember. I  
2 think there was only one or two that had a potential  
3 for being related to the water-training phenomenon  
4 that the staff was concerned with.

5 But it became clear to us that we needed  
6 to develop a document that would be an educational  
7 piece, if you will, primarily focusing for the  
8 industry, but we also felt that the NRC could possibly  
9 benefit from it. And that was the basic objective for  
10 the white paper that we developed.

11 The purpose for the educational piece was  
12 to articulate a clear understanding of the  
13 water-training phenomenon to articulate our assessment  
14 of the licensee event reports that the staff was using  
15 as a basis --

16 CHAIRMAN WALLIS: You're talking about a  
17 water-training phenomenon?

18 MR. MARRION: Water training, yes.

19 CHAIRMAN WALLIS: Training. Oh, I'm  
20 sorry.

21 MR. MARRION: Yes, water training. I'm  
22 sorry. I've got a cold, and I'm a little congested.  
23 I apologize.

24 CHAIRMAN WALLIS: That's my  
25 misunderstanding. I'm sorry.

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1 MR. MARRION: -- and also provide us a  
2 technically based understanding of the application of  
3 that phenomenon to basic cable configurations and  
4 insulation systems that exist in the power plants  
5 today or not in the power plants but exist in these  
6 applications today.

7 We concluded that you can't make a general  
8 statement that water training is of concern because  
9 it's not applicable to every cable configuration and  
10 insulation system that's in the field today.

11 It appears that the staff is attempting to  
12 require a cable-monitoring program. I'm not familiar  
13 with the details of the maintenance rule, but I know  
14 that the equipment to which these cables are  
15 terminated are monitored in the maintenance rule.

16 And since the cables aren't active  
17 components, I'm not sure whether they should be  
18 included in the maintenance rule or not. But  
19 fundamentally if the staff expectations and basis in  
20 this generic letter are not clear, you have the  
21 potential of a generic letter basically undermining a  
22 regulation.

23 I don't know if the staff has done a  
24 review with the maintenance rule folks within NRR, but  
25 I would recommend that be done before this is

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1 submitted.

2 CHAIRMAN WALLIS: You're implying this,  
3 but, in fact, they just say they're gathering  
4 information. And it's not clear that they intend to  
5 do anything which would change the regulation in any  
6 way or interfere with regulation. You don't know what  
7 they're going to do.

8 MR. MARRION: And the licensee has to  
9 document a justification of why they don't have a  
10 cable-monitoring program. That is --

11 CHAIRMAN WALLIS: But you're implying that  
12 something downstream is going to require this. That's  
13 not actually a --

14 MR. MARRION: No. I'm implying there may  
15 be a conflict between what the generic letter is  
16 asking for and what is required by the --

17 CHAIRMAN WALLIS: You're asking for  
18 information, rather.

19 MR. MARRION: Well, okay. That's one way  
20 of looking at it. It is a request for information or  
21 an attempt to require a cable-monitoring program. And  
22 I'll let you folks decide how you want to do that if  
23 they want to interpret that.

24 I think that, you know, the staff has made  
25 some comments about, you know, what their concern is.

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1 And it's not clear to me. I have to tell you I'm  
2 confused. Maybe it's because of our involvement over  
3 the past several years, but I have yet to see any kind  
4 of risk analysis or any kind of statistical analysis  
5 conducted by the NRC to articulate some level of  
6 confidence that they find unsatisfactory relative to  
7 the performance of the cable or the equipment.

8 We have attempted to do some statistical  
9 work in our white paper based upon the survey that we  
10 had conducted. I'm not happy with the fact that we  
11 didn't get 100 percent of the utilities to respond,  
12 but we got on the order of 80 percent, I think, 79.  
13 something. That has some benefit.

14 My concern at this particular point is  
15 when the generic letter is finally issued, based upon  
16 what I heard this afternoon, we're going to have to  
17 request a meeting, a public meeting, and probably  
18 document further clarification of what the NRC is  
19 really interested in this information request as they  
20 go forward because it's not clear at this particular  
21 point in time. And that's all I have to say. I would  
22 be more than happy to answer any questions you may  
23 have.

24 (No response.)

25 MR. MARRION: Okay. Thank you.

1 CHAIRMAN WALLIS: You're welcome.

2 You were suspicious that if they gather  
3 this information, then they might use it to require  
4 something which they wouldn't be able to do if they  
5 didn't have the information?

6 MR. MARRION: No. It's not clear what  
7 concern is trying to be addressed by the request for  
8 information.

9 CHAIRMAN WALLIS: Well, the concern is  
10 that these cables will fail. It's a simple concern.

11 MR. MARRION: Well, where does that  
12 concern stop? Do you stop at these cables or do you  
13 continue that concern at the equipment, et cetera,  
14 that is under continuous surveillance programs and  
15 testing? I mean, where does it end?

16 And it's a concern about having possible  
17 unanticipated failures? Well, where do you stop  
18 asking that question now that you started on medium  
19 voltage cables and the small population of medium  
20 voltage cables, I suspect?

21 So there are some real issues that have to  
22 be addressed here because the utilities are going to  
23 want to be responsive to the generic letter. My job  
24 is to make sure that we understand it adequately so  
25 the utilities will be responsive, but right now I'm

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1 not sure we have that understanding.

2 MEMBER BONACA: Well, if I understand it,  
3 I mean, the issue has to do with two things. One is  
4 inaccessible equipment that cannot be visually or  
5 other means inspected -- so it's a very narrow family  
6 -- and then equipment that is really in accepted  
7 applications.

8 And clearly equipment is seeing a water  
9 condition or wetness that -- so it's a pretty unique  
10 and narrow population, but I think at least I am  
11 interested to know what kind of equipment is being  
12 powered by this kind of cable out there. And if it is  
13 something critical, a generic letter or whatever,  
14 connection to off-site power, you know, it's a unique  
15 concern.

16 I mean, we addressed it and discussed it  
17 during license renewal because it was significant.  
18 And the industry and the NRC worked together on a goal  
19 inspection program for those cables.

20 And where does the aging start? I mean,  
21 does it start with a theatre of operation or does it  
22 start before? Clearly there is degradation taking  
23 place at some point. I realize I don't know all there  
24 is necessary to know about that.

25 MR. MARRION: If I may just offer a couple

1 of comments?

2 MEMBER BONACA: Yes?

3 MR. MARRION: The aging phenomenon begins  
4 from the time that the cable is shipped from the  
5 manufacturer's facility.

6 MEMBER BONACA: That's right.

7 MR. MARRION: And it's exacerbated by  
8 environmental conditions as well as operational  
9 conditions that wind up stressing the cable insulation  
10 system. And a submerged, wetted environment for  
11 certain insulation systems has the potential of  
12 increasing the aging or the rate of aging degradation,  
13 et cetera. That is well-known.

14 The equipment that's affected here  
15 includes diesel generators at some plants at 4,000 or  
16 4,160 volts as well as other plants at 6.9 kV. I  
17 don't know about -- I think one of the staff was --  
18 Tom made a comment about some diesel generators  
19 operating in the 480 volts. If that's indeed the  
20 case, then that's indeed the case.

21 But mean voltage cable in the industry is  
22 characterized as 2,000 to 15,000 volts. So I'm hoping  
23 that the generic letter will be very clear of  
24 articulating the 480-volt applications. And is it  
25 only for that particular piece of equipment or is it

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1 for something else? That's one of the points of  
2 clarity that's needed.

3 We tried to capture in our white paper --  
4 and I hope you've read it; we've made it available to  
5 you -- the current state of understanding of cable  
6 insulation systems at this voltage level and  
7 underground applications and which insulation systems  
8 are susceptible to water damage over time.

9 We have encouraged the utilities to  
10 prepare for such failures because if you look at the  
11 age of the fleet, we are approaching the end of  
12 service life of a lot of these cables. It's typically  
13 30, 35, 40 years based upon normal environmental  
14 conditions.

15 And our recommendation to the industry was  
16 don't wait for a failure before you have to deal with  
17 this problem because this is not the kind of cable  
18 that you typically keep large quantities in inventory  
19 at the warehouse, et cetera. And if you're not  
20 prepared, you will have an extended outage should you  
21 have such a failure.

22 I don't know if the generic letter is  
23 going to speak to that, but I also know that there is  
24 not a cable-monitoring system that is applicable and  
25 effective and available to the utilities today.

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1           There are some testing techniques that are  
2 effective for certain kinds of insulation  
3 configurations. And our white paper speaks to that.  
4 But based upon the information I have gotten from  
5 EPRI, who is pursuing research in this area, et  
6 cetera, that there isn't one technique that would be  
7 useful. So okay?

8           MEMBER BONACA: Thank you.

9           MR. MARRION: Thank you.

10          MEMBER BONACA: Yes. I think we're  
11 scheduled for some closing remarks. Is there?

12          MR. MAYFIELD: Just very briefly. We  
13 believe we have articulated why we need the generic  
14 letter. If indeed there is substantive confusion or  
15 misunderstanding once we have published the generic  
16 letter, we would, as always, be more than willing to  
17 meet with the industry and make sure that there is a  
18 common understanding of what we're asking for.

19          This generic letter has been in process  
20 for a while. And we do believe we need to move  
21 forward to get the generic letter published and allow  
22 licensees the opportunity to engage with it. We will  
23 be mindful of any conflicts with other generic  
24 communications that are going forward where we may be  
25 imposing unreasonable time constraints and resource

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1 constraints on the licensees. That's something that  
2 we will pay attention to and go back and pulse with  
3 the generic communication staff and the other  
4 technical staff to make sure we're online there.

5 With that, unless the Committee has other  
6 questions for the staff, I believe we have presented  
7 to you the information that we wanted to present. And  
8 we look forward to receiving a letter from you. Thank  
9 you.

10 MEMBER BONACA: Any other questions for  
11 Mr. Mayfield?

12 MR. FALLON: I have a question. Mike  
13 Fallon with Constellation Energy.

14 For the license renewal applicants that  
15 have submitted under the GALL report, these cables are  
16 all in the scope of license renewal, have been  
17 addressed in their applications. Are they being asked  
18 to resubmit this information again?

19 MR. KOSHY: This is Thomas Koshy.

20 This generic letter will fall under the  
21 Part 50 program, in which case we are addressing,  
22 let's say, something more than what was addressed in  
23 the renewal program. So there is a need for making  
24 separate submittal to the NRC in response to this  
25 generic letter.

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1 MR. FALLON: All of the cables that you  
2 have addressed, all of the safety-related cables, are  
3 in the scope of license renewal. And whether they're  
4 480-volt or they're medium voltage, they're addressed  
5 in those applications.

6 MR. MAYFIELD: Okay. Let me comment.  
7 This is Mike Mayfield from the staff.

8 You raise a good point. It is something  
9 we will look at and make sure we're not asking you to  
10 unnecessarily duplicate information. But that is a  
11 fair question, something that we'll make sure that --

12 MEMBER BONACA: Well, I am not aware that  
13 license renewal applications have the summary of all  
14 of the failures that have taken place. We are going  
15 to get to the information.

16 MR. MAYFIELD: We don't think we are in  
17 conflict, but it's a fair question. And we'll look to  
18 make sure we are not asking an unreasonable question.

19 CHAIRMAN WALLIS: But you will be looking  
20 at plants which doesn't necessarily have license  
21 renewal in prospect.

22 Are we through with this item now or --

23 MEMBER BONACA: Are there additional  
24 questions for the staff, for industry, for us?

25 (No response.)

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1 MEMBER BONACA: If none, I think it's  
2 over.

3 CHAIRMAN WALLIS: Thank you.

4 MEMBER BONACA: And we open it up back to  
5 you, Mr. Chairman.

6 CHAIRMAN WALLIS: Now, I really am  
7 reluctant to take a break for an hour. I wonder if we  
8 couldn't work on -- is it okay, staff who is an expert  
9 on this? Can we work on Mario's letter on this issue  
10 right now on just a preliminary basis?

11 Let's go off the record and work on his  
12 letter for half an hour or an hour.

13 MEMBER SIEBER: We have to come back.

14 CHAIRMAN WALLIS: Can we do that? You're  
15 not ready? We do have a draft letter. Will the  
16 Committee agree to work on his letter? We can discuss  
17 it now, but I think we can go off the record and  
18 discuss our reaction to this generic letter and work  
19 on our letter until about 3:00 o'clock. Is that okay  
20 with the Committee?

21 So let's do that. We'll come off the  
22 record now, and we will work on this letter until  
23 about 3:00 o'clock. We'll have some discussion now  
24 off the record.

25 (Whereupon, the foregoing matter went off

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1 the record at 2:25 p.m. and went back on  
2 the record at 3:18 p.m.)

3 CHAIRMAN WALLIS: We will come back on the  
4 record, come back into session.

5 CHAIRMAN WALLIS: The next item on the  
6 agenda is, let's see now, interim staff guidance. Is  
7 that what it is?

8 MEMBER BONACA: Yes.

9 CHAIRMAN WALLIS: And I will again call on  
10 Mario Bonaca to lead us through this one.

11 MEMBER BONACA: Okay.

12 4) INTERIM STAFF GUIDANCE AGING MANAGEMENT PROGRAM

13 FOR INACCESSIBLE AREAS OF BOILING WATER REACTOR

14 (BWR) MARK I CONTAINMENT DRYWELL SHELL

15 4.1) REMARKS BY THE SUBCOMMITTEE CHAIRMAN

16 MEMBER BONACA: We have the staff here to  
17 provide us with an overview on the proposed license  
18 renewal interim staff guidance on steel containment of  
19 BWR Mark I containments.

20 We have reviewed a number of BWRs. And  
21 we have often asked the question on the status of the  
22 steel liner. And we have seen different proposals by  
23 licensees, some of them planned inspections, only  
24 metric inspections. Some of the others don't.

25 And the staff is using a successful

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1 process that has been successful in most of the  
2 license renewal applications to date, the ISG process,  
3 as a means of proposing an approach that they expect  
4 the licensees to follow regarding this particular  
5 item.

6 And so the staff has come here to give us  
7 an overview of this process and what they are  
8 proposing to do. And I will let the staff go ahead.  
9 I don't know if Mr. Gillespie or Mayfield --

10 MR. GILLESPIE: Yes. If I could, just  
11 some opening comments to put in context what Linh and  
12 Hans are going to go through. Not only did we do a  
13 couple already, but we've got something like seven  
14 Mark I's lined up in the queue. And we have a number  
15 of very controversial ones in New Jersey,  
16 Massachusetts, and Vermont, where there is actually a  
17 lot of public interest. And we had no position on the  
18 liner itself.

19 There are some caveats or I'm going to say  
20 some wiggle room in this position I'd like to  
21 highlight to the Committee by way of how the staff is  
22 approaching this because a question at the meeting  
23 yesterday at Monticello was, why is it different plant  
24 to plant if you're trying to apply a consistent  
25 approach.

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1           This is kind of an approach for the plant  
2           that's got almost like the optimum conditions, of  
3           which Monticello with their leakage control programs  
4           and some things they were doing was.

5           Browns Ferry, an earlier one, which  
6           committed to doing some other measurements, actually  
7           had an operating history of having leaks. And so they  
8           had moisture content in there. And so we actually  
9           have -- this is a minimum condition, as we would look  
10          at it.

11          And there are also some wiggle words,  
12          quite honestly, in this. And that's where it says  
13          first you have to establish a degradation rate,  
14          basically. And then if you get moisture, this  
15          basically treats moisture in the outside of the shell  
16          the same as visible accelerated corrosion on the  
17          inside.

18          And we're using the ASME code kind of  
19          enhanced inspection, but, instead of referencing the  
20          code, we described the enhanced inspection in it in  
21          case the code changes in the future.

22          So we're bringing definition to an  
23          equivalence to inside and outside indications. And  
24          there is still a lot of room on how you establish the  
25          rate and what is the credibility of the rate.

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1           And so if you have a history as a facility  
2 of having leakage and, therefore, moisture in there,  
3 then I think the Committee should expect the staff in  
4 establishing the rate in those wiggle rooms because it  
5 says if you have moisture, reestablish your rate again  
6 -- and the only way to factually reestablish the rate  
7 is likely do a UT measurement and then connect the  
8 dots again. Literally a simplistic way of looking at  
9 it is a regression line between the now additional  
10 point.

11           And so Hans in his efforts as a reviewer  
12 still has a lot of room in what are the uncertainties  
13 in establishing the rate. And it's those  
14 uncertainties which kind of differentiate one plant  
15 from another. How do you reduce those uncertainties  
16 given different operating histories?

17           And so that's really how come Monticello  
18 is different from Browns Ferry. It's strictly  
19 operating history and the uncertainty involved with  
20 known moisture leak on multiple occasions.

21           So, with that, let me turn it over to Linh  
22 because that's just kind of the context. Linh, take  
23 it away.

24           4.2) BRIEFING BY AND DISCUSSIONS WITH  
25           REPRESENTATIVES OF THE NRC STAFF

1 MS. TRAN: Good afternoon. My name is  
2 Linh Tran. And I'm the Project Manager with the  
3 Division of License Renewal. And this is Hans Ashar.  
4 He's a senior civil engineer with the Division of  
5 Engineering.

6 We are here this afternoon to present the  
7 proposed license renewal interim staff guidance for  
8 the inaccessible area of the BWR Mark I drywell  
9 containment shell.

10 The purpose of this ISG is to provide  
11 guidance to future applicants on the information that  
12 is needed to be included in the license renewal  
13 applications for addressing the inaccessible area of  
14 the drywell shell.

15 Now, the proposed ISG here does not impose  
16 any no new technical requirement. And in previous  
17 license renewal application review by the staff, we  
18 usually can obtain the information in the applications  
19 or through the request for additional information.  
20 And usually we will get the information from the  
21 applicant.

22 The information provided by the applicant  
23 is sufficient for the staff to make its determination.  
24 However, it is not the most efficient way because of  
25 the RAI back and forth. And in an effort to reduce

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1 the number of RAIs, this proposed ISG would identify  
2 the information up front, so for the future  
3 applicants, what they should include in the LRAs, I  
4 guess, to make the staff review more efficient,  
5 information such as inspection results or analysis  
6 that would help the staff make the determination  
7 whether the containment would perform its intended  
8 function for the period of extended operation.

9 Past operating experience in the Mark I  
10 steel containments indicate that when water is  
11 discovered in the bottom outside area of the drywell  
12 shell, the most likely cause could be the water  
13 seeping through the inaccessible area.

14 And in slide 10 in your handout, I have a  
15 picture of the drywell shell. It is an inverted light  
16 bulb. That indicates where the inaccessible area  
17 would be.

18 And this area is the area for the distance  
19 between the drywell shell -- did you do slide 10?;  
20 that's a picture there; yes -- where the surrounding  
21 concrete structure is too small for successful  
22 performance of visual inspection. That's the area  
23 right there. The gap is usually two inches, three  
24 inches.

25 CHAIRMAN WALLIS: You used the term

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1 "seeping." It's really any water that gets there from  
2 any reason whatsoever.

3 MS. TRAN: Correct.

4 CHAIRMAN WALLIS: And "seeping" is used as  
5 a general term.

6 MS. TRAN: Term, correct.

7 CHAIRMAN WALLIS: It may not seep. It may  
8 actually flow or --

9 MS. TRAN: Flow through, right.

10 MR. ASHAR: The area that we are  
11 concentrating on is between the shell, between the  
12 shell and the concrete in the back, in between the  
13 insulation --

14 MEMBER BONACA: No, no, no.

15 MR. ASHAR: Oh, I'm sorry. Wrong place.

16 MS. TRAN: Right. That's --

17 MEMBER APOSTOLAKIS: It is between what  
18 and what?

19 MR. ASHAR: Between the freestanding steel  
20 containment --

21 MEMBER BONACA: Between the light bulb and  
22 the --

23 CHAIRMAN WALLIS: There's a space right  
24 there.

25 MR. ASHAR: And mostly it is filled with

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1 insulation.

2 MEMBER APOSTOLAKIS: How does the water  
3 get there?

4 MR. ASHAR: Water gets into -- I'm going  
5 to explain. There are three basic sources of water  
6 that we have seen so far in the operating history.  
7 One can be called because of the -- we don't have any  
8 picture of the actual area.

9 MS. TRAN: No. This is it.

10 MR. ASHAR: This is it. In this area,  
11 there are bellows, bellows between the driver.

12 CHAIRMAN WALLIS: We saw them this  
13 morning.

14 MR. ASHAR: Yesterday you may have seen  
15 it, yes. And those bellows can crack. And then they  
16 can give a seepage into the trough, which collects the  
17 water.

18 Now, if the drain, which is supposed to  
19 drain out all the water from there, is full or is not  
20 working properly, the water can accumulate in the  
21 trough area, which has been kept just for that  
22 purpose. And it may all flow in coming to this area  
23 here.

24 CHAIRMAN WALLIS: It's lower.

25 MR. ASHAR: Because it is not showing

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1 better this particular detail, this is not good  
2 enough. Yesterday it was a very nice picture here.

3 CHAIRMAN WALLIS: But in order to refuel,  
4 you have to flood the upper region there.

5 MR. ASHAR: That is correct.

6 CHAIRMAN WALLIS: And some of that water  
7 can get down on the outside.

8 MEMBER APOSTOLAKIS: Okay. Thank you.

9 MS. TRAN: Now, in this --

10 VICE CHAIRMAN SHACK: Now, is that the  
11 only source of the water, I mean?

12 MR. ASHAR: No, no. There are two or  
13 three we found so far. Okay? One is a cracking of  
14 bellows. Second one is there is a refueling seal  
15 between the bottom of the trough, concrete trough.  
16 And there is a systematic way of draining it out  
17 through a drainage. But drain gets clogged. And the  
18 water comes through that area. It collects in the  
19 trough again and goes into between the concrete and  
20 the drywell shed.

21 Clog one is the reactor cavity wall. You  
22 have a stainless steel liner on it. And stainless  
23 steel liner gets -- they may do for any reason. And  
24 the water goes directly from concrete into that gap in  
25 between the two.

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1                   These are three reasons we have identified  
2                   so far.

3                   CHAIRMAN WALLIS:   So what clogs this  
4                   drain?   You said the drain gets clogged?

5                   MR. ASHAR:   It is because of negligence on  
6                   the part of the various --

7                   CHAIRMAN WALLIS:   Yes.

8                   MR. ASHAR:   -- not to monitor them  
9                   correctly.   Now they have come to their senses.   And  
10                  they started telling us they are monitoring, they are  
11                  doing this, they are doing that.

12                  MEMBER BONACA:   The drains are down from  
13                  the sand cushions, right?

14                  MR. ASHAR:   They are separate.   After the  
15                  water leakage, it is the sand cushion area.   Then  
16                  there are drains to -- actually, those drains were  
17                  meant for making sure the scent does not go away.   And  
18                  if it is, then they can collect them and put them back  
19                  the same.   That was the whole idea behind it.

20                  But it has been used nowadays as a  
21                  water-collecting/catching kind of a thing.   It is an  
22                  indirect function of that particular drain, but that  
23                  shows that water is coming in.   If the drains into  
24                  that room, if it shows any kind of water in the Torus  
25                  room, then it shows that there is a water leakage from

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1 somewhere up above that is getting into that area.

2 CHAIRMAN WALLIS: It drains into the room  
3 around the Torus? It just drips down the wall  
4 somehow?

5 MEMBER SIEBER: Yes.

6 MR. ASHAR: The water comes from here.

7 CHAIRMAN WALLIS: That is a four-inch  
8 drain pipe. It just drains down the wall?

9 MR. ASHAR: This is a sand pocket here.

10 CHAIRMAN WALLIS: Where does it go to when  
11 it drains out of that four-inch drain pipe?

12 MEMBER SIEBER: Onto the floor.

13 CHAIRMAN WALLIS: It just drains onto the  
14 floor?

15 MR. ASHAR: Unless they are collectors.  
16 Some people have started collecting them into some  
17 kind of a jar. But most of them, yes, it was going  
18 onto the floor.

19 MS. TRAN: It goes onto the floor, yes.

20 MR. ASHAR: There is where they find out.

21 MEMBER BONACA: Now, some licensees have  
22 the drainage and some don't. That depends on the --

23 MR. ASHAR: Well, some licensees have  
24 drains of the sand pocket area here.

25 MEMBER BONACA: Down at the low point.

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1 MR. ASHAR: Some people have drains at  
2 this area somewhere on the top of it.

3 MEMBER SIEBER: I think all of them --

4 MR. ASHAR: And if it is on the top of it,  
5 then there has to be sealing between --

6 MEMBER SIEBER: All of them have the top.

7 MR. ASHAR: -- the concrete and the --  
8 yesterday we saw in the Monticello case, it was a  
9 seal, which was a galvanized steel shield between the  
10 sand pocket area and the above area. So it prevents  
11 the water from getting in.

12 MEMBER BONACA: The had a few ounces of  
13 water, too, at some point.

14 MR. ASHAR: Yes, yes.

15 MEMBER BONACA: So they must have come  
16 also from the top.

17 MR. ASHAR: In the case of Monticello,  
18 there were no signs like that. We did not see.

19 MEMBER BONACA: There were only a few  
20 ounces of water, they said.

21 MEMBER MAYNARD: Yes, but they speculated  
22 that that water had actually come from another source  
23 because of the two or three-inch sand pipe there.

24 MEMBER BONACA: On the sand pipe there,  
25 yes.

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1 MR. ASHAR: They could explain when you  
2 ask that question.

3 CHAIRMAN WALLIS: Well, if it drains down  
4 that four-inch drain pipe, I would assume that the  
5 sand is full of water.

6 MEMBER SIEBER: Yes.

7 MEMBER MAYNARD: Right. That is not the  
8 low point.

9 CHAIRMAN WALLIS: There is a lot of water  
10 there before it drains down the pipe. The sand  
11 pocket, the sand --

12 MR. ASHAR: The sand pocket has to be  
13 sucked up completely.

14 CHAIRMAN WALLIS: The sand cushion is  
15 saturated with water first.

16 MR. ASHAR: Right.

17 MEMBER SIEBER: A number of plants have  
18 drains at the bottom of the sand --

19 MR. ASHAR: At the bottom --

20 MEMBER SIEBER: It would make more sense  
21 to --

22 MR. ASHAR: Some people have at the bottom  
23 of the sand pocket area drains with -- again,  
24 actually, it is to retain the sand inside. So that  
25 all flowing sand can be collected, but if they can use

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1 it at the --

2 MEMBER SIEBER: What is the purpose of the  
3 sand in the first place?

4 MR. ASHAR: Okay. See, this is the --

5 MEMBER SIEBER: Got a cushion?

6 MR. ASHAR: -- concrete area -- okay? --  
7 here. And this one when the shell expands under  
8 pressure --

9 MEMBER SIEBER: It is room to --

10 MR. ASHAR: -- it gives you some room to  
11 budge in.

12 MEMBER SIEBER: Expand? Okay. But the  
13 whole bottom of the shell sits on concrete? So you  
14 don't worry about corrosion below the sand?

15 MR. ASHAR: We do in some cases. We do to  
16 some extent, yes. If --

17 MEMBER SIEBER: How do you address that?  
18 You can't get to it because the top of it is concrete,  
19 too.

20 MR. ASHAR: If there is an appreciable  
21 collection of water in the sand bucket area, there is  
22 a chance that the water might have gone between the  
23 steel shell and the concrete.

24 MEMBER SIEBER: Right.

25 MR. ASHAR: But those cases, we have not

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1 found many so far except one, one case.

2 MEMBER SIEBER: You probably don't know --

3 MR. ASHAR: Yes, sir.

4 MEMBER SIEBER: -- you've got a concrete  
5 pad, a hemispherical pad, and then concrete above  
6 that.

7 MR. ASHAR: Right.

8 MEMBER SIEBER: And so there's no way to  
9 make a measurement.

10 MR. ASHAR: We know.

11 MS. TRAN: The interior.

12 MEMBER SIEBER: You can't get to the  
13 inside unless you cut the concrete out.

14 MR. ASHAR: Unless you cut the concrete or  
15 there are some new methods that have been developed in  
16 the NRC's research program, which have guided matters,  
17 but they are not yet being calibrated and haven't been  
18 used extensively by anybody.

19 So there are potential uses for those  
20 things under these examinations, but we have not seen  
21 them use it so far. We have just put one report from  
22 Oak Ridge National Lab in e-mail items so that people  
23 can look at that report and see if it is applicable  
24 for them.

25 CHAIRMAN WALLIS: Didn't someone yesterday

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1 say they actually made holes in that concrete in order  
2 to inspect?

3 MR. ASHAR: Yes.

4 MS. TRAN: Monticello.

5 MEMBER SIEBER: Next to the pedestal.

6 MR. ASHAR: Yes. They had to do that.

7 MEMBER SIEBER: But that is about as far  
8 as you can go because --

9 MR. ASHAR: That is as far as you can go  
10 right now, right.

11 MEMBER SIEBER: It's really thick in  
12 between.

13 MR. ASHAR: Yes. You can go up to here in  
14 the sand pocket area. Anything below that, if there  
15 is a --

16 MEMBER SIEBER: Of course, the sump is in  
17 there, too.

18 VICE CHAIRMAN SHACK: But typically,  
19 though, I mean, your experience is that there is no  
20 water there or that they all collect water?

21 MR. ASHAR: Typically the water has been  
22 very little. There has been water except in one case  
23 in the case of, I think it is, Dresden III, when they  
24 had to put firewater in here to extinguish a fire in  
25 the gravel area here --

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1 VICE CHAIRMAN SHACK: Well, that would do  
2 it.

3 MR. ASHAR: -- because of a summation  
4 fire. I don't know why.

5 MEMBER SIEBER: Good place to get a fire.

6 MR. ASHAR: But there was a fire there.  
7 They put a lot of water into it. And this whole area  
8 becomes soft here in the sand --

9 CHAIRMAN WALLIS: I'm interested to see  
10 when the sand gets full of water by some mechanism how  
11 it ever gets out. How does it ever get dry?

12 MR. ASHAR: With sand you --

13 CHAIRMAN WALLIS: If you had water access,  
14 suppose the bellows fails --

15 MR. ASHAR: Except the temperature --

16 CHAIRMAN WALLIS: -- water runs down.

17 MEMBER SIEBER: Aren't there drains at the  
18 bottom of this thing pushing it, right?

19 MR. ASHAR: Some have. This one is not  
20 shown here. There is a drain right here.

21 CHAIRMAN WALLIS: There is a drain there?

22 MR. ASHAR: There is a drain.

23 MEMBER SIEBER: Okay.

24 CHAIRMAN WALLIS: So that is how you draw  
25 out the sand? You just let it soak out?

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1 MEMBER SIEBER: It drips into where the --

2 MR. ASHAR: The temperature in the drywell  
3 in general in that area is close to about 130-140  
4 degrees. So it helps a little bit drying --

5 CHAIRMAN WALLIS: It evaporates the water?

6 MR. ASHAR: To some extent, not -- I mean,  
7 I have been given those explanations by various  
8 applicants, I know, what does this, but I do not  
9 believe everything they say. But --

10 CHAIRMAN WALLIS: Okay.

11 MS. TRAN: Slide five, please.

12 MEMBER SIEBER: You say the space between  
13 the concrete and the shell and the drywell is filled  
14 with insulation.

15 MR. ASHAR: Yes, there is insulation in  
16 there.

17 MEMBER SIEBER: What is it, some kind of  
18 fiber of some sort?

19 MR. ASHAR: I think so, yes. In one case  
20 we found that insulation was bad enough that it has  
21 chloride and all those contaminants. So when the  
22 water came in, it came with contaminated water. And  
23 that started accelerating the corrosion rate.

24 MEMBER SIEBER: That would do it. The  
25 insulation holds the water all up and down.

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1 MR. ASHAR: Up and down.

2 MR. GILLESPIE: Hans, I think it is  
3 important here that we're not talking in every case  
4 about any single containment.

5 MR. ASHAR: Right.

6 MR. GILLESPIE: What you have hit on is  
7 exactly what I tried to say in the beginning. The  
8 specific designs are so variant that we have really  
9 found out in doing these reviews that a Mark I  
10 containment is not a Mark I containment when you're  
11 looking at the drain details and the drain location.  
12 It's a function of the age, the AE. And, for example,  
13 Nine Mile actually put cameras up to ten-inch drains  
14 that they have and looked up in there, and it was  
15 dust.

16 And so before we assume that this thing is  
17 always full of water on everyone, there is a great  
18 variance between each unit. The design is different.  
19 And what licensees have done in the past to verify  
20 either the presence or absence of water is very  
21 different.

22 And so it's not like there is a universal  
23 answer to each one of these. Each one really is  
24 different.

25 VICE CHAIRMAN SHACK: Now, again, just on

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1 that, are all of the ones filled with insulation or  
2 are some of them actually air gaps?

3 MEMBER ARMIJO: I thought Monticello was  
4 an air gap based on yesterday's presentation.

5 MR. ASHAR: It is called air gap. I mean,  
6 in general, the terminology used is air gap.

7 VICE CHAIRMAN SHACK: But, I mean, is it  
8 typically filled with insulation?

9 MR. ASHAR: Typically it is a concrete  
10 General Electric design. It has the insulation in  
11 most cases. There might be a plant or two that may  
12 not have it available, but there might be some plants.

13 MEMBER SIEBER: You almost need it to be  
14 the form for pouring the concrete.

15 MR. ASHAR: Right, exactly.

16 MEMBER SIEBER: You need something in  
17 there to do that. Otherwise you don't have a gap at  
18 all. And one of the ways you get water down there is  
19 you have to take that refueling seal out after you  
20 refuel in order to put the drywell back together. And  
21 the process of doing that leaves a lip of water --

22 MR. ASHAR: Right.

23 MEMBER SIEBER: -- all around where the  
24 seal --

25 MR. ASHAR: Right.

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1 MEMBER SIEBER: -- used to be. It can  
2 only go down.

3 CHAIRMAN WALLIS: Now, we had a plant  
4 recently which had bulges in this realignment.

5 MR. ASHAR: I want to clarify two things.  
6 Okay?

7 CHAIRMAN WALLIS: It was Brunswick.

8 MR. ASHAR: There is a problem with the  
9 terminology. The first thing, when we talk about the  
10 drywell shell, it is a freestanding drywell steel  
11 shell. And when we talk about the liner, it is  
12 attached to concrete with some kind of anchorages.

13 And that is where we use the word "liner."  
14 But I have seen people using very loosely "drywell  
15 liner" here. It is not true. Okay? We are going to  
16 clarify the terminology in the next -- there is no --

17 MEMBER SIEBER: The one plant that has the  
18 liner, the shell, the structural member is the  
19 concrete, the subject of the code.

20 CHAIRMAN WALLIS: Yes, that's right.

21 MEMBER SIEBER: So you can tolerate some  
22 amount of corrosion as long as you --

23 CHAIRMAN WALLIS: So the liner just sits  
24 on the --

25 MEMBER SIEBER: -- maintain tightness.

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1 CHAIRMAN WALLIS: Okay. So the liner sits  
2 on the concrete, which is why it bulges.

3 MEMBER SIEBER: Just in that one plant.

4 CHAIRMAN WALLIS: This one is  
5 freestanding, this one.

6 MEMBER SIEBER: Yes.

7 MR. ASHAR: The one we are showing is a  
8 freestanding shell plus the liner.

9 MS. TRAN: Okay. Slide five. For some  
10 applications, just the information provided was  
11 included in the various sections of the LRA. And for  
12 other applications, the information was obtained to  
13 request for additional information.

14 As a result, the proposed ISG recommended  
15 that future applicants provide a plant-specific aging  
16 management program that would address the loss of  
17 material for the accessible area of the drywell shell.

18 So the recommendations that the applicant  
19 should be included in there, in the aging management  
20 program to develop a corrosion rate that is really  
21 inferred from past UT examination or establish a  
22 corrosion rate using representative samples in similar  
23 operating condition.

24 CHAIRMAN WALLIS: I would think the  
25 corrosion rate was so low that it would be difficult

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1 to measure. Really, you could say that it's less than  
2 a certain amount.

3 MS. TRAN: Less than, then. No minimum  
4 design.

5 CHAIRMAN WALLIS: That's good enough. You  
6 don't actually want them to determine what it is  
7 because you might be so low that you can't measure it.  
8 But if it's less than a certain amount, that would be  
9 acceptable, wouldn't it?

10 MR. ASHAR: In general, subsection IWE of  
11 the ASME code allows close to about ten percent  
12 allowance --

13 CHAIRMAN WALLIS: I know, but --

14 MR. ASHAR: -- some localized corrosion.

15 CHAIRMAN WALLIS: But if there is no water  
16 there, the corrosion rate may be essentially zero.

17 MS. TRAN: Correct.

18 CHAIRMAN WALLIS: And so establishing a  
19 zero thing is very difficult to do.

20 MEMBER SIEBER: Really, what you are  
21 trying to do is to determine how close you are to  
22 min wall.

23 MR. ASHAR: The min wall, right, minimum  
24 wall.

25 MEMBER SIEBER: And by plotting the

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1 reduction in thickness, you can determine when you are  
2 going to hit min wall. At that point you no longer  
3 meet the code for that pressure vessel.

4 VICE CHAIRMAN SHACK: How do I do this?  
5 Do I have to have multiple UT readings from that  
6 inaccessible portion of the shell? Can I demonstrate  
7 that mine is always dry?

8 MEMBER MAYNARD: You could develop a way  
9 that you had data from the --

10 MR. ASHAR: Two in the same location.

11 MEMBER MAYNARD: If an applicant comes in  
12 and they don't have previous data, I'm not sure how  
13 they develop a rate.

14 MS. TRAN: This is what we learned in  
15 putting this together. They will have one point at  
16 the beginning, you know, the design of the fabrication  
17 point. And then as a result of generic letter 87-05,  
18 most applicants, I mean, yes, have another data point.  
19 So when using that, they could develop some kind of --

20 VICE CHAIRMAN SHACK: Again, that is very  
21 specific. How many data points did they take when  
22 they made those UT measurements? How many locations?

23 MS. TRAN: Eighty-seven? Do you know?

24 MR. ASHAR: Yes. Generally in response to  
25 87-05, a number of -- now I have to say licensees, not

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1 applicants -- licensees have taken that kind of  
2 approach that they will look at four points in four  
3 sectors --

4 VICE CHAIRMAN SHACK: Four quadrants.

5 MR. ASHAR: -- because they don't remove  
6 the sand. They just have the sand. It's not like  
7 Oyster Creek. So what they do is they chip out the  
8 concrete in certain areas and then take the  
9 measurements and in response to 87-05.

10 And the second reading they take is two  
11 years or so after. That gives them a closer rate at  
12 the same location. It isn't delicate science that,  
13 hey, something is going on. Then they do more work.

14 VICE CHAIRMAN SHACK: Now, again, from  
15 Monticello, they don't seem to have maintained those  
16 as access ports.

17 MEMBER SIEBER: No.

18 MR. ASHAR: No, they don't. I mean, they  
19 can get to it if they have to, but they don't maintain  
20 them because they --

21 MEMBER SIEBER: That becomes another  
22 pocket for corrosion --

23 MR. ASHAR: Yes, right. It becomes --

24 MEMBER SIEBER: -- because there is  
25 moisture inside the containment.

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1 MR. ASHAR: Right.

2 MEMBER SIEBER: In the sump is actually  
3 that floor there. The sump is built into the floor.  
4 And so every loose water, amount of water, ends up in  
5 that space where the drywell liner and the concrete  
6 meet.

7 So they have to fill it up. They have to  
8 do something. Otherwise you would have a pocket of  
9 water sitting there.

10 CHAIRMAN WALLIS: I am still a little  
11 puzzled. I would think that the corrosion rate is so  
12 low that it's within the uncertainty in the ultrasound  
13 measurements.

14 MR. ASHAR: If it is low, they will report  
15 as low.

16 MS. TRAN: At least we will have --

17 MEMBER SIEBER: Carbon steel water and --

18 CHAIRMAN WALLIS: There's no water there.

19 MR. GILLESPIE: As it happens with real  
20 applicants, we're looking at corrosion rates like 17,  
21 18 ml a year in some cases.

22 CHAIRMAN WALLIS: There is water there.

23 MR. GILLESPIE: Well, yes. And people are  
24 seeing some evidence of corrosion. In another case,  
25 Nine Mile case, they did these measurements. And then

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1 they have a high-corrosion area on mild carbon steel  
2 at the water line in the Torus.

3 And what they did was they took that rate  
4 as a conservative estimate, where they know water is,  
5 and applied it to their liner and say, "Okay. We've  
6 got 38 years to go here."

7 And so people actually have come up with  
8 ways given these points and other representative  
9 carbon steel areas within their area that they do  
10 measure because they're in harsher environments and  
11 applied that as a representation to this in order to  
12 show that they could make it past the renewal period  
13 or at least until the next measurement that they might  
14 commit to take.

15 And so so far each licensee that we have  
16 had an opportunity to both finish our review or  
17 interface with so far has actually been extremely  
18 consistent with this position. And so they have  
19 actually figured out how to do it.

20 And there is other carbon steel in the  
21 Torus, actually in a wet environment, which gives you  
22 a noticeable rate, as it happens, particularly where  
23 some of the liners have blistered and bubbled, which  
24 is a whole other issue, that they can apply to this.

25 It's a conservative application. You

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1 know, if it doesn't work, then they have to do  
2 something else to convince us that the rate is okay.

3 So when we talk the nebulous philosophy,  
4 it gets harder, but I think when you get to specific  
5 plant situations, pardon the pun, but it's concrete.  
6 And so they have kind of come up with ways to use the  
7 generic point, the generic letter issue points.

8 In fact, in Vermont Yankee's case, they  
9 actually had leakage and did extra measurements  
10 consistent with the ISP, which wasn't issued when they  
11 did this some years ago. And so they have preserved  
12 those extra points.

13 And so it just happens that these plants  
14 actually have this information sitting there. They  
15 just haven't used it in this application before. And  
16 this is clarifying. We expect you to use it in this  
17 application.

18 Go ahead, Linh.

19 MS. TRAN: I guess now where degradation  
20 has been identified in accessible area of the drywell,  
21 meaning in the interior area of the drywell, the  
22 applicant should provide an evaluation that would  
23 address the condition of the inaccessible area of a  
24 similar condition or find something in the interior  
25 area. They should have an evaluation for that.

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1 Now, to assure --

2 MEMBER APOSTOLAKIS: How does one do that?

3 MR. ASHAR: Let me. The actual, this is  
4 just what we have seen.

5 MEMBER APOSTOLAKIS: That's okay. You  
6 don't have to show it.

7 MR. ASHAR: Okay. This is the requirement  
8 we set in after when we endorsed IWE, IWL into  
9 50.55(a) in the rule, that if they find something in  
10 the accessible area, they ought to go and look in the  
11 surrounding inaccessible area to see if there is  
12 anything going on.

13 A lot of PWR licensees, for example, have  
14 found that at the junction of the steel liner of the  
15 concrete containment and the concrete floor, they have  
16 moisture barriers generally. And their moisture  
17 barrier gets damaged. The borated water many times go  
18 in. And it starts corroding the inside area. It  
19 shows up a little bit on the upper side.

20 So they would do examination and find out  
21 what is going on. And they find the moisture barrier  
22 could be the culprit. They have to change the  
23 culprit. They ought to go inside. They ought to take  
24 out the corrosion.

25 So that's the reason this problem has been

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1 in about the inaccessible. In accessible area you  
2 have corrosion. You would look into the joining  
3 inaccessible area to find every --

4 MEMBER APOSTOLAKIS: You will look into  
5 the inaccessible area. That helps make it accessible  
6 or not?

7 MR. ASHAR: No. If you see some rusting  
8 or something on the --

9 MEMBER APOSTOLAKIS: You can look at it.  
10 Why isn't it accessible?

11 MR. ASHAR: No, no. The whole area is  
12 that you see something in an accessible area. And  
13 they investigate as to what is going on underneath  
14 that particular area. The basic focus in the room was  
15 the PWR containments. That is where it was found in  
16 so many of them. And still we are finding it.

17 MEMBER ARMIJO: But it is possible you  
18 could have damage occurring in an inaccessible area  
19 and have nothing in the accessible.

20 MR. ASHAR: That's quite right.

21 MEMBER SIEBER: Possible.

22 MR. ASHAR: That is why this type of --

23 MEMBER ARMIJO: Very possible. I mean,  
24 it's --

25 MS. TRAN: That is why we use accessible

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1 area as the indication for the accessible area for the  
2 augmented inspection. They have to do visual in the  
3 surface. And then if the surface area is accessible  
4 only from one side and they have to protect the wall  
5 thing by using ultrasonic --

6 MEMBER ARMIJO: I don't worry about the  
7 accessible. I just worry about the inaccessible and  
8 having no way of knowing just by looking at the  
9 accessible area. It's not a good --

10 MR. ASHAR: That is where this ISG kicks  
11 in because this ISG is focused on inaccessible area.  
12 This is one of the pointers, that if there is  
13 something going on in the accessible area, which you  
14 can see right away, then there is something going on  
15 and you will look at it.

16 MEMBER ARMIJO: That is the easy part.

17 MR. ASHAR: The ISG concentration, focus  
18 of this ISG, is the inaccessible areas.

19 MEMBER APOSTOLAKIS: But how does one  
20 suspect?

21 CHAIRMAN WALLIS: Yes, that's right. How  
22 does one suspect?

23 MEMBER APOSTOLAKIS: How do you suspect?

24 MS. TRAN: You find water or leakage on  
25 your --

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1                   MEMBER APOSTOLAKIS: That is getting back  
2 to what Dr. Armijo is saying. That's not our worry.  
3 What if you don't find water? You still make some  
4 problem in the inaccessible area. Is that correct?

5                   MEMBER ARMIJO: Yes, you could.

6                   MEMBER APOSTOLAKIS: So how does one  
7 suspect that something is going on in the inaccessible  
8 area?

9                   MEMBER BONACA: No. She says water.

10                  MS. TRAN: Water is one. If you find  
11 water in the drain lines, water in the drain line, in  
12 the --

13                  MEMBER BONACA: For example, if the seals  
14 -- I guess you are focusing on the seals and on the  
15 bellows, right?

16                  MR. ASHAR: Right.

17                  MEMBER SIEBER: The only way you can get  
18 water into the inaccessible area is to have it flow  
19 through the accessible area. So if you make a  
20 measurement in the accessible area --

21                  MEMBER APOSTOLAKIS: Okay. That is a  
22 different --

23                  MEMBER SIEBER: -- that gives you some  
24 kind of justification to extrapolate to the area you  
25 get.

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1 MEMBER APOSTOLAKIS: But that doesn't help  
2 much because it could have run down --

3 VICE CHAIRMAN SHACK: The water runs down  
4 and collects at the --

5 MEMBER SIEBER: Right.

6 VICE CHAIRMAN SHACK: It doesn't stay on  
7 the side of the --

8 MEMBER BONACA: That is why the real focus  
9 is the last bullet. And that's what they attempted to  
10 do, you know, to put in the seals and the bellows in  
11 the scope of license renewal. And this has been kind  
12 of debated with the industry.

13 CHAIRMAN WALLIS: This is a very weak  
14 statement, "if moisture is suspected." That's a very  
15 subjective --

16 MS. TRAN: Or detected.

17 CHAIRMAN WALLIS: If you have a suspicious  
18 nature, you would suspect it all the time.

19 MR. ASHAR: Subsection IWE in its  
20 IWE-1240, there's a number of items. This is the  
21 abbreviated form. A number of places where this could  
22 occur is very vividly described in there, IWE-1240 in  
23 the ASME code. And that is what we are invoking, but  
24 we did not write everything that is written in the  
25 IWE-1240.

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1 MEMBER APOSTOLAKIS: Now, you are really  
2 including SSCs that are identified as source of  
3 moisture and scope, source of moisture?

4 MR. ASHAR: Yes. For example, cracking of  
5 bellows.

6 MEMBER SIEBER: The refueling seal.

7 MR. ASHAR: I explained to you earlier.

8 MEMBER APOSTOLAKIS: Okay. That's what --

9 MS. TRAN: The refueling seal is not.

10 MR. ASHAR: Refueling seal.

11 MS. TRAN: So they have to put that in the  
12 scope of license renewal.

13 MR. ASHAR: This is what we are --

14 MEMBER APOSTOLAKIS: Okay.

15 CHAIRMAN WALLIS: Why don't they just  
16 require that they check the bellows for cracks  
17 routinely?

18 MR. ASHAR: It is not very easy to get to  
19 it. They can do tests. That's what they do most --

20 MEMBER SIEBER: It not the only place it  
21 can leak.

22 MR. ASHAR: Yes. And I say --

23 MEMBER SIEBER: They can leak along the  
24 edge.

25 MR. ASHAR: Yes. And this is what we want

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1 to have them in the scope of license renewal, so they  
2 maintain them in a condition where it is not leaking.

3 MEMBER MAYNARD: Well, by "suspected"  
4 here, don't you really mean if there has been some  
5 previous evidence that moisture has been there? You  
6 know, I suspect. I have a hard time dealing with what  
7 I might suspect, but I can deal with whether I have  
8 had any indications or evidence.

9 MS. TRAN: Yes. This is "suspect" or  
10 "detected" through your drain lines.

11 CHAIRMAN WALLIS: Well, if moisture is  
12 detected, now, that makes sense.

13 MEMBER MAYNARD: Yes.

14 MS. TRAN: It should be "detected,"  
15 instead of "suspected."

16 VICE CHAIRMAN SHACK: So if moisture has  
17 been detected any time in the life of this plant up  
18 until license renewal included? Is that what it says?

19 MEMBER APOSTOLAKIS: It is not really  
20 detected. Go ahead. You answered my question.

21 CHAIRMAN WALLIS: Well, just take out the  
22 "if" clause and say, "include."

23 VICE CHAIRMAN SHACK: Yes. Why not just  
24 include them?

25 MEMBER APOSTOLAKIS: I think "suspected"

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1 is broader because would that include a situation  
2 where you have seen moisture or water in a similar  
3 facility and you suspect it may happen in yours, even  
4 though you hadn't seen it? "Suspected" is broader.

5 MEMBER MAYNARD: Well, yes, but I think  
6 from a regulatory standpoint and from dealing with  
7 licensees, I think you need a little bit better  
8 definition rather than it just being somebody's  
9 opinion sitting there saying, "Well, I suspect there  
10 might be something there."

11 CHAIRMAN WALLIS: Suspected by whom?  
12 Inspector or is it --

13 MEMBER MAYNARD: Well, I like the  
14 "detected" or --

15 MS. TRAN: Detected. I think --

16 MEMBER BONACA: We had a discussion  
17 yesterday at Monticello that shows how difficult the  
18 issue is. I mean, we rely very much on subjective  
19 judgments and say, "Well, we don't think we ever had  
20 water."

21 CHAIRMAN WALLIS: You could simply say  
22 that "The ACRS suspects that there may always be water  
23 there. Therefore."

24 MEMBER APOSTOLAKIS: You guys must have  
25 had a hell of a meeting yesterday.

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1 VICE CHAIRMAN SHACK: In Monticello's  
2 case, they see no evidence of corrosion in '87, which  
3 was a fairly substantial operating period for them.

4 MEMBER APOSTOLAKIS: That's right.

5 MS. TRAN: Identified.

6 MEMBER ARMIJO: If they have good records,  
7 they have a good sound --

8 VICE CHAIRMAN SHACK: One data point.

9 MR. ASHAR: We have to draw things --

10 MEMBER ARMIJO: They don't have to do it.

11 MS. TRAN: So just to get back on --

12 CHAIRMAN WALLIS: You really fixed this  
13 up.

14 VICE CHAIRMAN SHACK: Why not just put  
15 these seals in scope and be done with it?

16 MR. ASHAR: This is what we tried to do  
17 earlier. And there is so much resistance from a  
18 number of applicants. I mean, I had to go to three or  
19 four RAIs over and above a lot of teleconferences to  
20 convince them to put this in the scope of license  
21 renewal. And so many people denied.

22 CHAIRMAN WALLIS: So now you have to  
23 convince them to suspect something?

24 MR. ASHAR: No. Now, with this ISG, if  
25 they have suspected sites, areas, then --

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1 CHAIRMAN WALLIS: But they don't want to  
2 do it anyway. They'll never suspect anything.

3 MEMBER APOSTOLAKIS: No. Presumably there  
4 will be some guidance what suspicion means.

5 MR. ASHAR: There is a guidance.

6 MEMBER APOSTOLAKIS: Yes.

7 MR. ASHAR: There is.

8 CHAIRMAN WALLIS: There must be.

9 MEMBER APOSTOLAKIS: It just doesn't say  
10 it in bullets.

11 MS. TRAN: Yes.

12 MR. ASHAR: I was looking for IWE-1240  
13 here. I don't have one.

14 CHAIRMAN WALLIS: Okay.

15 MR. ASHAR: But that is where it is fully  
16 described as to -- this is what we are invoking here  
17 basically.

18 CHAIRMAN WALLIS: You want to say  
19 something, "if there are indications of moisture" or  
20 something like that.

21 MR. KUO: If I may, Part 54 rule in the  
22 rule language in the SOC discussed this, saying if a  
23 component is in an environment that could have aging  
24 effect, say in the operating experience, anywhere in  
25 the industry or your specific plant, that there is

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1 such a degradation mechanism, degradation mechanism  
2 that could cause an aging effect, then an aging  
3 management program should be provided. That's what  
4 the Part 54 rule requires.

5 In other words, if this is a possible  
6 aging effect from the operating experience, then that  
7 is suspected. You would use the word "suspect." That  
8 happened before. We should not talk about the  
9 hypothetical aging effect, but it is an aging effect  
10 that we have seen before.

11 VICE CHAIRMAN SHACK: Right. That is why  
12 I can't understand why you can't just put the seals in  
13 scope. I mean, it's not a hypothetical event.

14 MR. KUO: Like Hans said, some people  
15 don't want to include the seal in the scope.

16 CHAIRMAN WALLIS: There are often people  
17 who don't want to do things, but you can say, "Do it."

18 MEMBER BONACA: What you want and what you  
19 get are two different things.

20 MR. GILLESPIE: I think you will find as  
21 a result of this ISG, fundamentally seals are in  
22 scope. Remember, seals and the refueling stuff are  
23 not safety basically. And so what we're doing is  
24 because of the effect of non-safety components on a  
25 safety component, we're bringing them into scope. So

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1 it's a bit indirect.

2 And so it shouldn't be a surprise that  
3 utilities don't want extra requirement on things that  
4 don't have any requirements on them now.

5 MEMBER BONACA: But, you know, one thing  
6 that we are learning from this license renewal process  
7 as we converge, it seems to me that the central issues  
8 are becoming the inaccessible or buried components  
9 that you can't look at, that you cannot measure. And  
10 that's natural because, I mean, these plants are going  
11 beyond some original design in certain components of  
12 the -- and I think that it is important that we focus  
13 on these inaccessible components and ask our  
14 questions, you know, how long can this live and what  
15 is the source of the problem. And here -- anyway --

16 MS. TRAN: Hans wanted me to read the  
17 IWE-1241, the examination surfaces, "Surface area for  
18 the typical location," "Typical location of such areas  
19 of those exposed to stand-in water, repeated wetting  
20 and drying, persistent leakage, and those with  
21 geometries that permit water accumulations,  
22 condensation, and biologicals attack." I mean, it is  
23 in the -- it tells the applicant the area.

24 Now, let's say if moisture is detected as  
25 suspected or identified --

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1 (Laughter.)

2 MS. TRAN: Now, we will agree that they  
3 found water. Okay? So they should include the  
4 component, the source of it, in the scope of license  
5 renewal. In addition, we need to identify the surface  
6 area.

7 Next slide. By implementing and  
8 augmenting inspection for the period of extended  
9 operation in accordance with the ASME section 11,  
10 subsection IWE and also for the examination shall be  
11 in accordance with section 11, subsection IWE-2500.  
12 And I did go over that a little bit earlier.

13 That means that surface area accessible  
14 from both sides should be visually examined and  
15 surface area that is only accessible from one side  
16 should be examined for wall thinning and using sonic  
17 thickness measurement method.

18 Now, after all of that, after all of the  
19 augmented inspection, the applicant should demonstrate  
20 that either corrosion is not occurring by performing  
21 those examinations or analysis to do analysis on the  
22 result or that corrosion is progressing so slowly that  
23 the age-related degradation will not jeopardize the  
24 intended function of the drywell to the period of  
25 extended operation.

1 VICE CHAIRMAN SHACK: Just how thick is  
2 this light bulb again?

3 MR. ASHAR: The light bulb? It varies.  
4 From the top, it is thinner, very thin, right around  
5 half-inch to three-quarter-inch. As you go down near  
6 the knuckle area between the sphere and the upper  
7 part, it is spherical area. It is close to about .7,  
8 .6 inches. Then it again goes down up to six inches.  
9 And then at the bottom area is about one to one and a  
10 half inches in between the sand pocket area --

11 VICE CHAIRMAN SHACK: No. But, I mean,  
12 it's 17 ml a year.

13 MR. ASHAR: Oh, yes.

14 VICE CHAIRMAN SHACK: You're going to chew  
15 that at a pretty good clip.

16 MEMBER BONACA: If you find a hole in the  
17 liner, I mean, would you suspect some moisture there?  
18 I mean, what is --

19 CHAIRMAN WALLIS: Even my chassis of my  
20 car, which is soaked in salt, doesn't corrode at 17 ml  
21 per year, does it? It's really bad conditions if  
22 you've got --

23 MR. GILLESPIE: Yes. That actually is the  
24 two worst points that a particular --

25 CHAIRMAN WALLIS: Yes, very bad --

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1 MR. GILLESPIE: -- that they reported to  
2 us. What it does do, though, is say there is  
3 operating history out there in this utility  
4 environment, that we cannot take for granted that it  
5 can't happen.

6 CHAIRMAN WALLIS: Right.

7 MR. GILLESPIE: And that's the reason for  
8 the ISG. We are not going to make the assumption  
9 because we have operating history that says it's not  
10 necessarily a valid assumption in all cases that it's  
11 going to go slow. There has been evidence of this  
12 going faster than people would have originally  
13 anticipated in the designs.

14 MEMBER BONACA: But in some cases where we  
15 have questioned the bellows, particularly the seals,  
16 if you're in seals, then the answer is always, well,  
17 we have good drainage. So you are in a quandary. I  
18 mean, what leads you --

19 MR. ASHAR: There are a number of things  
20 that tells us. The first thing, the drains are not  
21 clogged any time in the past. The second thing,  
22 visual examinations performed in the areas, it was  
23 shown there are no telltale signs of water for a  
24 number of inspections there performed. Then they had  
25 to show us at the bottom in the drain line there was

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1 no water coming out anywhere.

2 So there are so many things that they  
3 would tell us before they convince us that there is  
4 nothing going on.

5 MR. GILLESPIE: Mario, I would also say  
6 that I think this came up in Monticello's case  
7 yesterday, --

8 MR. ASHAR: Right.

9 MR. GILLESPIE: -- where they didn't take  
10 credit for it, but they actually had a primer sprayed  
11 on the outside of the inaccessible area. And other  
12 licensees have different applications of codings on it  
13 also.

14 And so it's not one thing.

15 MEMBER BONACA: Yes, I know, but --

16 MR. GILLESPIE: Aging management is  
17 accumulation of codings, time of exposure, amount of  
18 water.

19 MEMBER BONACA: And the spray on the  
20 surface was 65 or 40 years ago practically, 1965. So,  
21 you know, right. I understand.

22 MR. GILLESPIE: But the environment is not  
23 such that there is anything in there to actually cause  
24 the paint to peel off either. So there's no one issue  
25 here.

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1 MEMBER BONACA: Yes. I understand.

2 MR. GILLESPIE: It's different pieces to  
3 try to give you reasonable assurance.

4 MEMBER BONACA: In fact, yesterday at the  
5 end of the conversation, it was the lady who was  
6 performing the inspections felt confident with that.  
7 I'm sure that if you go physically and look at it and  
8 get information, you know, you can build a credible  
9 case that there is no concern with moisture. So I  
10 accepted that yesterday.

11 MEMBER ARMIJO: But a case has to be made  
12 --

13 MEMBER BONACA: Yes, it does.

14 MEMBER ARMIJO: -- with documented data,  
15 not just --

16 MEMBER BONACA: Right.

17 MEMBER MAYNARD: Is there something that  
18 is done periodically to ensure that these drains are  
19 really open, like particularly the sand point drains  
20 and stuff, that they're not plugged in some way?

21 MR. ASHAR: Now they are committing to  
22 those things. They have ensured those things, yes.

23 VICE CHAIRMAN SHACK: You'll find out when  
24 you have a leak.

25 MEMBER SIEBER: A sand pocket drain is a

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1 four-inch pipe. So they're hard to plug.

2 VICE CHAIRMAN SHACK: Yes.

3 MEMBER BONACA: I believe we have also  
4 some comments from the industry.

5 MS. TRAN: Right. Yes.

6 MEMBER BONACA: So shortly we'll get to  
7 those.

8 MS. TRAN: I am almost done. Now, if the  
9 intended function of the drywell cannot be met, the  
10 applicant can identify actions that will be taken as  
11 part of the aging management program to ensure that  
12 the integrity of the drywell would be maintained  
13 through the period of extended operation.

14 Last slide. Now, the drywell shell  
15 concern has already been addressed for the reactor's  
16 initial 40 years' licenses and relevant plants that  
17 have received a renewal license, as indicated in the  
18 left column there.

19 Now, the staff is in the process of  
20 reviewing the plants in the middle column. And the  
21 third column represented the remainder of the plants  
22 with the Mark I steel containment design.

23 Not all the plants in the third column,  
24 however, have announced their intention to renew their  
25 license, but the future review that's listed on the

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1 right side.

2 This concludes my presentation. So we can  
3 entertain any additional questions that you might  
4 have.

5 MEMBER BONACA: You don't have to request  
6 questions.

7 CHAIRMAN WALLIS: Ell, I suspect there  
8 might be some more questions.

9 (Laughter.)

10 MEMBER SIEBER: I don't know what they  
11 would be that we haven't already asked.

12 MEMBER BONACA: Any additional questions?

13 (No response.)

14 MEMBER BONACA: None. So we thank you for  
15 a very good presentation.

16 MS. TRAN: Thank you.

17 CHAIRMAN WALLIS: You have been here all  
18 day, Alex.

19 MR. MARRION: I know. Can I get one of  
20 those little name tag things? I'll just put it on.

21 (Laughter.)

22 MR. MARRION: Good afternoon. My name is  
23 Alex Marrion. I'm Senior Director of Engineering with  
24 NEI. And with me I have James Ross, who is the senior  
25 project manager with lead responsibility for license

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1 renewal. He's here to keep me out of trouble. He  
2 should have been here earlier.

3 I just want to make a couple of general  
4 comments. Based upon comments that the NRC made about  
5 the uniqueness of the specific plant designs, we feel  
6 that this is not really a generic issue, but it's  
7 appropriate to address it on a plant-specific basis in  
8 accordance with the uniqueness of the designs. And I  
9 think Frank Gillespie brought that up.

10 This is not a new issue. It's been  
11 addressed by the licensees in the past. There was a  
12 generic letter, 8705. And inspection requirements  
13 were incorporated into NRC regulations when NRC  
14 endorsed the ASME code subsection IWE as part of an  
15 update of 10 CFR 50.55(a).

16 Because that was already regulatory  
17 requirements, utilities were resisting the idea of  
18 imposing an additional regulatory requirement given  
19 that there wasn't sufficient evidence to indicate that  
20 the current requirement was not adequate if that makes  
21 sense.

22 The particular interim staff guidance is  
23 out for comment. Right now comments are due the 8th  
24 of June. We intend to submit comments on behalf of  
25 the industry.

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1           Most of the comments will be of a  
2 clarifying nature to make sure we understand the  
3 language, et cetera, which brings me to a more generic  
4 communication process issue. You know how I feel  
5 about generic communications based upon comments I  
6 made earlier.

7           The one thing that is not clear to us as  
8 an industry is why there is a need for an ISG process  
9 to begin with given that the NRC already has a  
10 well-established generic communication process that  
11 could be used as a vehicle for communicating staff  
12 guidance going forward.

13           So now we have generic communications.  
14 And we also have interim staff guidance, two separate  
15 processes that basically overlap. So we're going to  
16 continue making that point with every opportunity we  
17 have.

18           Lastly, I understand some question has  
19 been raised about the idea of continuing or the idea  
20 of imposing ultrasonic testing requirements. I want  
21 to make it clear that the current requirements that we  
22 currently have are for a graded approach to a visual  
23 examination.

24           And depending upon what you find, you do  
25 a more comprehensive examination, but the first step

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1 is a visual. And that's basic --

2 CHAIRMAN WALLIS: How do you visually  
3 inspect these inaccessible areas?

4 MR. MARRION: Well, as you heard from the  
5 staff, you do an examination of the inaccessible areas  
6 based upon what you find of the accessible areas if I  
7 have characterized it properly in what the staff was  
8 proposing.

9 And for the Mark I's, we intend to  
10 continue that process going forward. And we will be  
11 commenting accordingly on the ISG comments.

12 CHAIRMAN WALLIS: You have to be able to  
13 access some place which is relatively typical of the  
14 inaccessible places in order to do that.

15 MR. MARRION: Yes. I'm not familiar with  
16 the details of what that is, yes.

17 That's all I have, sir.

18 MEMBER ARMIJO: I just think that is  
19 fundamentally unsound because you have, really, a  
20 crevice condition in that sand pocket area. It's not  
21 at all represented by the accessible area.

22 And so looking at a safe location to make  
23 a judgment of a susceptible location seems to me a  
24 waste of time. I mean, if the accessible area is  
25 highly corroded, you can be sure that the inaccessible

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1 is in bad shape.

2 MR. MARRION: Right.

3 MEMBER ARMIJO: But the converse isn't  
4 true.

5 MEMBER APOSTOLAKIS: But didn't Jack say  
6 that for the water to get to the inaccessible area, it  
7 has to go through the accessible areas?

8 MEMBER ARMIJO: Yes, but it doesn't stay  
9 there.

10 VICE CHAIRMAN SHACK: It doesn't stay  
11 there.

12 MEMBER ARMIJO: It flows.

13 VICE CHAIRMAN SHACK: You have got a drain  
14 right at that thing. I mean, there is no way for  
15 water to really accumulate --

16 MEMBER APOSTOLAKIS: It is not  
17 accumulating.

18 VICE CHAIRMAN SHACK: -- in that  
19 accessible area.

20 CHAIRMAN WALLIS: But it gets to the sound  
21 --

22 MEMBER APOSTOLAKIS: But you are going to  
23 see some moisture or something.

24 MEMBER ARMIJO: You can make a case that  
25 if it's always been dry, that's your best case. You

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1 have good data.

2 MEMBER MAYNARD: I thought part of that,  
3 it would depend on what you include as a visual area  
4 for what you base -- if you're including the drains  
5 and if there is any moisture coming out of the sand  
6 drains or anything like that, well, that might be  
7 appropriate. But if you're saying that all you have  
8 to do is just visually look at the inside of the  
9 container there, that you don't have to do anything  
10 else.

11 But if you include as part of what you  
12 find visually results of drains and other things --

13 MR. MARRION: That is a comprehensive  
14 examination requirement that's in 50.55(a) right now.

15 Thank you. And I appreciate the time I  
16 spent with this illustrious body today.

17 (Laughter.)

18 MEMBER KRESS: We are honored to have you.

19 MEMBER BONACA: If there are no further  
20 questions, first of all, I want to thank the staff for  
21 their presentations and for the information. And then  
22 I'll turn the meeting back to you, Chairman.

23 CHAIRMAN WALLIS: Thank you very much.

24 We are finished with our formal  
25 presentations for the day.

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1 MEMBER KRESS: We don't have a letter on  
2 this particular issue?

3 MEMBER BONACA: No.

4 MEMBER KRESS: This was just a briefing?

5 CHAIRMAN WALLIS: Just a briefing. It was  
6 just a briefing.

7 MEMBER BONACA: There is no impact  
8 because, I mean, it was helpful because, again,  
9 yesterday we had a --

10 CHAIRMAN WALLIS: We don't need that --

11 MEMBER KRESS: Are we going to give some  
12 feedback now or anything on what we've heard or do you  
13 think the questions are sufficient?

14 VICE CHAIRMAN SHACK: The questions were  
15 sufficient.

16 CHAIRMAN WALLIS: Unless you have another  
17 point you want to make. Do you want to make some  
18 point?

19 MEMBER KRESS: Well, my point was that I  
20 just don't like this round-about way of doing things  
21 in the sense that I think there's a fatal flaw in  
22 trying to use the accessible areas to determine  
23 whether or not there is a problem in the inaccessible  
24 areas.

25 I would do what Bill Shack just said. Why

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1 not just include those sources of moisture within the  
2 scope?

3 VICE CHAIRMAN SHACK: Well, I think --

4 MEMBER KRESS: I know it has been resisted  
5 by the industry, but it doesn't seem like that big of  
6 a burden to me. I think that's the real solution.  
7 And that's what they're after, but they're trying to  
8 do it in a round-about way.

9 VICE CHAIRMAN SHACK: I also think a  
10 techie could come up with a way to measure those  
11 thicknesses.

12 MEMBER KRESS: Show me that way, and that  
13 may be okay. That's possible.

14 MEMBER SIEBER: Well, when you put the  
15 refueling seal in the scope, all you're doing is  
16 establishing an aging management program for that.  
17 That doesn't prevent leakage necessarily because there  
18 may be something other than the aging that causes the  
19 leaking.

20 MEMBER KRESS: Okay. Maybe. Maybe I am  
21 flawed.

22 MEMBER SIEBER: You could twist it, and  
23 now it leaks.

24 CHAIRMAN WALLIS: You should probably  
25 inspect a more susceptible area, which is a sand

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1 pocket.

2 MEMBER SIEBER: I think you have to deal  
3 with the --

4 MEMBER BONACA: In the past we left it to  
5 the --

6 MEMBER SIEBER: -- rather than deal with  
7 something that is removed from it.

8 MEMBER BONACA: In the past we left it to  
9 a licensee to have a choice. For example, in Browns  
10 Ferry, the staff was asking for inspection of the  
11 seals. They fought that. We left them open, either  
12 that or UT the liner in the vulnerable locations. And  
13 they chose to UT the liners.

14 The burden is inaccessibility because  
15 there is going to be that every ten years. And when  
16 they do the ISR, they are in containment. And they  
17 physically can then perform most of the utilities in  
18 those locations. So we left open those possibilities.

19 I take your point, and I think the  
20 Committee should decide. Should we have a comment on  
21 this or -- the intent wasn't one of providing a  
22 letter. This was an informational presentation, but  
23 --

24 CHAIRMAN WALLIS: I think the staff has  
25 heard our comments. It was a preliminary sort of

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1 thing. And that is probably good enough for now.

2 MR. GILLESPIE: We appreciate the comments  
3 because, as Mario said, underground cabling, piping,  
4 and this kind of large passive component are really  
5 becoming kind of the end point. Everything else we  
6 know how to deal with for the most part.

7 But I will say in this case -- and let me  
8 take Browns Ferry. You might say, well, why did  
9 Browns Ferry choose UT versus the seals. Browns Ferry  
10 actually had unidentified sources of leakage. And he  
11 said versus trying to identify every source of leakage  
12 because they didn't know where it was that their  
13 cheapest way out was actually to do the UT.

14 But they got the idea that we wanted to  
15 wait. And you had to assure us this thing was going  
16 to be okay relative to thickness.

17 VICE CHAIRMAN SHACK: That sand pocket is  
18 pretty big. I mean, you can have a fair amount of  
19 moisture in there that you're never going to see  
20 coming out of those drains. And, yet, you could have  
21 attack over a reasonable fraction of that.

22 MEMBER SIEBER: There are oodles of  
23 surface in there for the moisture to collect on.

24 MR. GILLESPIE: But, again, the locations  
25 of the drains are plant-specific. Some plants have

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1 seals, as Monticello had over it. Some places have a  
2 liner or coding on the other side of the surface.

3 VICE CHAIRMAN SHACK: Well, a bottom drain  
4 would give me a whole lot more comfort than that top  
5 drain would.

6 MR. GILLESPIE: Yes. The other thing is  
7 the sand is very compacted.

8 MEMBER KRESS: Have you ever tried to  
9 drain moisture out of the sand from the bottom? It  
10 doesn't come out.

11 MR. GILLESPIE: I don't want to pooh-pooh  
12 it, but the idea that this is a 130-degree area also  
13 --

14 VICE CHAIRMAN SHACK: You drive it out  
15 with --

16 MR. GILLESPIE: And so you're going to  
17 drive it out. And so you've actually got the occasion  
18 to get water in there about 20 days every 18 months or  
19 24 months depending on the fuel cycle someone is on  
20 and how long it's flooded. And that's why we've  
21 started to key into visual. You might say, visual  
22 leakage from someplace kicks you into needing to do a  
23 UT.

24 Now, what this inter-staff guidance  
25 position does do is says the identification of

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1 moisture, basically leakage, is equivalent to the  
2 visual recognition of accelerated corrosion on the  
3 inside. And that's an important distinction, which  
4 never existed before.

5 So for the inaccessible areas, we're using  
6 the indirect indication of seeing water as kind of an  
7 assumption that you have to do the same thing as if  
8 you saw accelerated corrosion on the inside. That  
9 gets us a measurement on an event basis.

10 And so someone who is sworn to keeping  
11 this thing dry, if they have an event during a  
12 refueling where they get leakage in there, now they're  
13 obligated to do something which is a bit more onerous  
14 and reestablish their rate.

15 It's not perfect. By the way, there are  
16 two inaccessible areas. We should be clear on that.  
17 There is the inaccessible area in the air gap. And  
18 then there's this inaccessible area that's layered on  
19 the bottom between the two concrete layers, which is  
20 really probably the most difficult area, but it was  
21 designed to last 40 years. It is totally lined with  
22 concrete. And then you've got this temperature  
23 gradient.

24 CHAIRMAN WALLIS: Is 40 years good enough  
25 with license renewal, though?

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1 MR. GILLESPIE: Now, it was originally  
2 designed for 40 years, but that was kind of an  
3 assignment. But now if you have no evidence of in  
4 leakage or water in there, I mean, again, it's  
5 indirect stuff. It's almost like a circumstantial  
6 case we're acting --

7 CHAIRMAN WALLIS: Concrete is not dry all  
8 the time.

9 MR. GILLESPIE: Concrete is porous  
10 material, and it is not dry all the time. And so then  
11 you could ask questions. A fair question in the aging  
12 management program is, what are you doing about  
13 groundwater? And do we have any evidence of  
14 groundwater?

15 We asked that from Nine Mile. And I think  
16 we're coming. I signed up the draft SE this morning.  
17 So I think next month we're probably coming on Nine  
18 Mile. They have actually got alarms on their drains  
19 if moisture is detected.

20 So every plant is doing some unique  
21 things.

22 CHAIRMAN WALLIS: Moisture can come out of  
23 the concrete. There is a lot of concrete. There is  
24 a late curing of the concrete which goes on for a long  
25 time. Then it can be damp. It doesn't have to be

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1 very damp --

2 MR. GILLESPIE: Right.

3 CHAIRMAN WALLIS: -- to produce some  
4 chemical reaction.

5 MR. GILLESPIE: What is the impact? This  
6 is what I don't know, is what is the impact of this  
7 temperature gradient.

8 CHAIRMAN WALLIS: You don't have oxygen.  
9 So that is probably what protects you.

10 MR. GILLESPIE: And so there is a number  
11 of things that -- we're doing our best, appreciate the  
12 Committee's comments, and more than happy. If anyone  
13 else has any better ideas, we would love to have them,  
14 but this ISG was an effort to send a benchmark for  
15 basically the best-performing plant on liners.

16 It has no moisture. What if you get  
17 moisture? How do you establish your rate? This is  
18 kind of putting out, in essence, that they now know we  
19 do expect a rate to even be established. We didn't  
20 have that in writing before.

21 CHAIRMAN WALLIS: We won't comment on it,  
22 and we hope it works out.

23 MR. GILLESPIE: Well, feel free to comment  
24 on it. We're happy to have comments. NEI is going to  
25 feel free to comment on it.

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1 CHAIRMAN WALLIS: We won't.

2 MEMBER BONACA: Certainly we will comment  
3 on individual applications.

4 MR. GILLESPIE: Yes. I do think this is  
5 middle ground we are wrestling with here because I do  
6 agree with Alex that the individual designs that we're  
7 applying this concept to are significantly different.  
8 In critical questions, like locations of drains, some  
9 are going to be more susceptible than others.

10 As I said, Browns Ferry said we have  
11 unidentified leakage. We know we have leakage. It's  
12 not a lot. UT is our answer. It's the only way that  
13 could give us positive confirmation.

14 CHAIRMAN WALLIS: Have they been having  
15 leakage on their reactor which has been shut down for  
16 all that period of time, unidentified leakage?

17 MR. GILLESPIE: Well, remember, we license  
18 units I, II, and III. The floor wasn't flooded on 1.  
19 So they haven't had any leakage on I for a long time.

20 CHAIRMAN WALLIS: They think they haven't.  
21 They could have an unidentified leakage.

22 MR. GILLESPIE: They had some unidentified  
23 leakage from refuelings in the other units, and they  
24 chose UT.

25 MEMBER SIEBER: They have them for fuel

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1 for --

2 MR. GILLESPIE: By the way, this is a very  
3 high-dose area, too. And so the question here isn't  
4 money.

5 MEMBER BONACA: Not only they. I mean --

6 MR. GILLESPIE: It's going to be dose.

7 MEMBER BONACA: Where the seals are, it's  
8 a very high red area.

9 MR. GILLESPIE: Yes.

10 MEMBER BONACA: Not down in the sand  
11 pocket.

12 MR. GILLESPIE: It depends on where you're  
13 at. You're directly under the vessel.

14 CHAIRMAN WALLIS: No one is going to go  
15 down there.

16 MR. GILLESPIE: My understanding from the  
17 licensees is from a radiological perspective, this is  
18 not an area you want to take lightly doing extra  
19 measurements over and above what you really need to  
20 confirm your --

21 CHAIRMAN WALLIS: BSBWR has hatches that  
22 you go in into the reactor pedestal area.

23 MEMBER BONACA: We were told by TVA that  
24 it is not a high red area because it is well below the  
25 --

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1                   MEMBER KRESS:  Graham, I was wondering if  
2                   the staff is considering a user need letter to  
3                   Research to try to develop a way to do this more  
4                   definitively, maybe strong on ultrasonics or  
5                   something.  Is there such a user need letter or any --

6                   VICE CHAIRMAN SHACK:  Well, there is  
7                   something from Oak Ridge now.

8                   MR. GILLESPIE:  Actually, there is a  
9                   letter report that just recently got put in ADAM from  
10                  Oak Ridge, from a project that Research sponsored, but  
11                  it is not commercially available yet.  And, as best I  
12                  understand it, it is a technique to calibrate for this  
13                  concrete steel concrete sandwich.

14                  I think, as I understand it, there are  
15                  three different alternative approaches to doing it.  
16                  And so the information is starting to be developed and  
17                  published.  But we're probably years away from actual  
18                  commercial application to go from the research bench  
19                  to the --

20                  MEMBER KRESS:  Yes, but you have got years  
21                  to go to do it in.  I mean, the corrosion rate is low  
22                  enough that --

23                  MR. GILLESPIE:  I am not disagreeing.  If  
24                  the Committee would like to -- we think we're actually  
25                  pretty close right now on a plant-by-plant basis.  But

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1 if the Committee would like to write a letter  
2 recommending a research project, it's okay. I don't  
3 mind. It's your Committee.

4 MEMBER SIEBER: The question is what do  
5 you want to cut out to pay for it.

6 MEMBER MAYNARD: I would like to just add  
7 on to Tom's previous comment just a little bit. It  
8 doesn't surprise me. And I would expect the industry  
9 to resist new requirements, new changes to things. I  
10 think it better to get the fight over, have it once,  
11 rather than a lot of times.

12 So, rather than dealing with a lot of  
13 things through staff guidance, generic letters, a lot  
14 of times it would be better if this is going to be a  
15 new expectation, new requirement, let's follow the  
16 process and make that -- you know, get the fight over  
17 with once, make it happen, rather than continually  
18 trying to go around these systems just generically.

19 MEMBER SIEBER: The requirement has always  
20 been there. And it stems from the code requirement.  
21 The question is, what do you do and how do you do it  
22 to give yourself a reasonable assurance that you're  
23 okay.

24 MR. GILLESPIE: The new aspect now is  
25 people having to articulate in an aging management

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1 program what they're going to do to ensure that their  
2 monitoring and measurement process for this liner will  
3 detect its approach to minimum wall thickness prior to  
4 it getting there.

5 I mean, that's really what plant license  
6 renewal is, to ensure that you have the additional  
7 monitoring programs in place that you will detect and  
8 correct prior to exceeding that minimum wall  
9 thickness.

10 The discussion of this ISG between us and  
11 the industry is evoked. I think it has now gotten us  
12 to a point where we have some actual cases under our  
13 belt that have now, you might say, set the standard  
14 for the next ones to come in.

15 And now we've got each plant evaluating  
16 itself against the plants we have already looked at  
17 and saying, "Am I like them? Am I different? If I'm  
18 different, then is it a positive difference or  
19 negative difference?"

20 And now we're starting to get those kind  
21 of aging management considerations into this piece of  
22 equipment, which we did not have, quite honestly,  
23 going in until we hit Browns Ferry.

24 The Committee wants -- Mario will remember  
25 this. I forget which BWR they were in. It was on the

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1 steam dryers. And I used the Committee. I quoted the  
2 Committee to the staff on the liner. And it was on  
3 the dryers.

4 And, Mario, I forget. You might have been  
5 the one who said it. You said it's large, it's  
6 passive, and you just wrote a generic letter saying  
7 it's safety. It wasn't in scope before that statement  
8 was made. It's now in scope. And, you know, the  
9 staff said it's large, it's passive, it has corrosion,  
10 and it's safety. And so now we're trying to take it  
11 on head on. I think with some success, you're seeing  
12 the applications getting it addressed at some level of  
13 credibility now.

14 MR. THADANI: Graham, I have one quick  
15 question.

16 Frank, you noted this is a high-dose area.  
17 This issue is one important in many ways, has I think  
18 rather minimal risk to public. How is that sort of  
19 balanced in terms of the actions called for and its  
20 relative importance?

21 MR. GILLESPIE: I think how we are trying  
22 to deal with that -- and we have got a meeting with  
23 one applicant day after tomorrow, Oyster Creek, on  
24 this, on our residual concerns after their RAIs. And,  
25 really, what we started talking about was the

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1       uncertainties involved in the decision.

2                   And so the question really is, how much  
3       should you pay for certainty in a decision? Because  
4       the significant measurement uncertainty and doing  
5       these UT exams, they're actually fairly coarse.

6                   There is uncertainty in primers and  
7       liners, which have exceeded, basically, the  
8       manufacturer-recommended lives of 10 to 15 years.  
9       Yet, they're still there. And they're still being  
10      inspected doing what they're doing.

11                  There is uncertainty in have you picked  
12      enough selected locations because we are looking for  
13      a general area degradation. We're not looking for  
14      just pitting.

15                  The Committee didn't mention it, but there  
16      are really two concerns. One is pressure retention  
17      and accident. And the other is buckling, the sheer  
18      collapsing of this thing under its own weight. And so  
19      you've got two reasons to inspect two different areas.

20                  And so I would suggest that in this ISG  
21      and what we're seeing from these utilities, we're  
22      actually accepting, you might say, a fair level of  
23      uncertainty in it to keep it rational.

24                  And so the safety consideration is in how  
25      much do we want to press people to make it more and

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1 more certain. And so that's really how we're  
2 factoring in the safety significance of it.

3 When I talk about dose and how many  
4 measurements need to be taken, we need reasonable  
5 assurance. And in many cases, there's not positive  
6 evidence on either side because this is a large  
7 passive thing that was put in there. It's expected to  
8 last forever fundamentally from the designer's point  
9 of view. We're confirming that assertion.

10 CHAIRMAN WALLIS: It probably will in most  
11 plants last.

12 MR. GILLESPIE: In most plants, I think it  
13 will. And so it's a confirmation. And so we're not  
14 designing the plant, which is very vigorous. We're  
15 confirming that the expected performance will be  
16 sustained. And we probably can be slightly less  
17 rigorous in the uncertainty we accept on that.

18 CHAIRMAN WALLIS: That is all the agency  
19 ever does. It doesn't design plants.

20 MR. GILLESPIE: Right.

21 CHAIRMAN WALLIS: It confirms performance.

22 MR. GILLESPIE: But you learn how much,  
23 what you're going to do in that confirmation.

24 MEMBER BONACA: Yes.

25 CHAIRMAN WALLIS: I think we may have gone

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1 over. We have gone over 15 minutes. I think it's  
2 about time we --

3 MEMBER BONACA: One last comment I had was  
4 that, you know, so many of the -- however the  
5 inspection processes we still depend on, for example,  
6 the visual inspection of this, we are still at the  
7 pace that really was conceived at the moment these  
8 plants are put in renewal. Okay? So every ten years  
9 they go in and look at it. Okay?

10 To me, you know, as these plants get older  
11 and older, these inaccessible areas, et cetera, you  
12 know, then maybe the frequency with which we're  
13 looking at it becomes more questionable because, you  
14 know, every ten years, a lot of things can happen.

15 CHAIRMAN WALLIS: Especially when you  
16 start to find things.

17 MR. GILLESPIE: We have occasions in  
18 several licensees where because they were sticking to  
19 a more extended inspection period, even when they had  
20 evidence of water, they did not consider evidence of  
21 water equivalent to accelerated corrosion visually.

22 So this ISG actually tries to take the  
23 principle you just espoused and says, "You can no  
24 longer in our expectation, staff's expectation, you  
25 can no longer ignore the presence of water. You have

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1 to now give us positive confirmation that the rate of  
2 degradation is still being minimized.

3 CHAIRMAN WALLIS: It is not boric acid.

4 MR. GILLESPIE: Yes, yes. At least we're  
5 dealing with a general moisture.

6 CHAIRMAN WALLIS: Right.

7 MR. GILLESPIE: And so this actually does  
8 go for that extended period to some incidents in which  
9 we actually have evidence from various licensees.  
10 They had evidence of water and basically did an  
11 engineering evaluation and did not obtain positive  
12 information if the thickness was okay.

13 MEMBER BONACA: What are you going to do  
14 when one of the already approved license renewals is  
15 going to come in for another license renewal?

16 MR. GILLESPIE: They have talked to us  
17 about that.

18 MEMBER BONACA: Well.

19 MR. GILLESPIE: I'm hoping to be retired  
20 by that point.

21 MEMBER BONACA: Anyway, I think we will  
22 see how this works.

23 MR. GILLESPIE: I started with the draft  
24 of the renewal rule in 1989 and have been doing this  
25 now for the last five years. At some point, someone

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1 else should do it.

2 MEMBER BONACA: All right.

3 MR. GILLESPIE: Thank you.

4 MEMBER BONACA: I give you back the  
5 meeting, Mr. Chairman.

6 CHAIRMAN WALLIS: We are ready to come off  
7 the record. Thank you very much for recording the  
8 meeting today, and we will take a break until a  
9 quarter to 5:00.

10 And when we come back, we will finish  
11 Mario's letter, which seems to be fairly  
12 straightforward. And then we will know where we are  
13 going with the other letter, hopefully know well  
14 enough that we can see our way to the end of it  
15 tomorrow.

16 (Whereupon, the foregoing matter was  
17 concluded at 4:34 p.m.)

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# Official Transcript of Proceedings

## NUCLEAR REGULATORY COMMISSION

Title: Advisory Committee on Reactor Safeguards  
533rd Meeting

Docket Number: (not applicable)

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS (ACRS)

533rd MEETING

+ + + + +

WEDNESDAY, MAY 31, 2006

+ + + + +

ROCKVILLE, MARYLAND

+ + + + +

The Subcommittee met in Room T2B1 at Two White Flint North, 11555 Rockville Pike, Rockville, Maryland, at 8:30 a.m., Graham B. Wallis, Subcommittee Chair, presiding.

MEMBERS PRESENT:

- GRAHAM B. WALLIS Chairman
- WILLIAM J. SHACK Vice Chairman
- GEORGE E. APOSTOLAKIS Member
- J. SAM ARMIJO Member
- MARIO V. BONACA Member
- RICHARD S. DENNING Member
- THOMAS S. KRESS Member
- OTTO L. MAYNARD Member
- JOHN D. SIEBER ACRS Member-At-Large
- JOHN LARKINS Designated Federal Official

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1       ACRS STAFF PRESENT:

2       HANS ASHAR                    NRR

3       DANIEL FRUMKIN                NRR

4       ALEX KLEIN                    NRR

5       THOMAS KOSHY                 EEEEB/DE/NRR

6       MICHAEL MAYFIELD             DE/NRR

7       GEORGE MORRIS                EEBE/DE/NRR

8       LINH TRANS                    NRR

9       GEORGE WILSON                NRR

10      ROBERT WOLFGANG             NRR

11      ROY WOODS                     RES

12

13      ALSO PRESENT:

14      HAROLD BARRETT             Duke Power Company

15      MIKE FALLON                 Constellation Energy

16      ALEX MARRION                NEI

17      DAVID MISKIEWICZ            Progress Energy

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AGENDA ITEMS

PAGE

Opening Remarks, Chairman Graham B. Wallis . . . 4

Draft Final Generic Letter, "Post-Fire  
Safe-Shutdown Circuit Analysis  
Spurious Actuations" . . . . . 5

Draft Final Generic Letter 2006-XX,  
"Inaccessible or Underground Cable  
Failures that Disable Accident  
Mitigation Systems" . . . . . 149

Interim Staff Guidance on Aging Management  
Program for Inaccessible Areas of Boiling  
Water Reactor (BWR) Mark I Containment  
Drywall Shell . . . . . 195

Adjournment

## P R O C E E D I N G S

(8:31 a.m.)

CHAIRMAN WALLIS: The meeting will now come to order.

This is the first day of the 533rd meeting of the Advisory Committee on Reactor Safeguards. During today's meeting, the Committee will consider the following:

Draft Final Generic Letter, Post-Fire Safe-Shutdown Circuit Analysis Spurious Actuations, Draft Final General Letter, Inaccessible or Underground Cable Failures that Disable Accident Mitigation Systems, Interim Staff Guidance on Aging Management Program for Inaccessible Areas of Boiling Water Reactor Mark I Containment Drywell Shell, and Preparation of ACRS reports.

This meeting is being conducted in accordance with the provisions of the Federal Advisory Committee Act. Dr. John T. Larkins is the Designated Federal Official for the initial portion of the meeting.

We have received no written comments from members of the public regarding today's sessions. We have received a request from Alex Marrion, NEI, for time to make oral statements regarding the Generic

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1 Letter on Post-Fire Safe-Shutdown Circuit Analysis and  
2 the Generic Letter on Inaccessible or Underground  
3 Cable Failures that Disable Accident Mitigation  
4 Systems.

5 A transcript of portions of the meeting is  
6 being kept and it is requested that the speakers use  
7 one of the microphones, identify themselves, and speak  
8 with sufficient clarity and volume so that they can be  
9 readily heard.

10 I will begin with some items of current  
11 interest. In the items handed out to you, I notice  
12 that there is a speech by Commissioner Yatzko at the  
13 beginning. And at the end, there is an interesting  
14 article on various matters which complicate PWR sump  
15 evaluations.

16 Now in the middle of the day, we are going  
17 to have ethics training which is why the lunch break  
18 is so long today. And the ethics training is  
19 scheduled for between 12:15 and 1:30 so you should be  
20 here at 12:15 and ready to be trained in ethics.

21 That is the end of my prepared remarks.  
22 And I'd like to proceed with the meeting. Call on  
23 Rich Denning to get us started on the first item.

24 MEMBER DENNING: Thank you. We will be  
25 hearing from the staff regarding the draft final

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1 generic letter 2006-XX, Post-Fire Safety-Shutdown  
2 Circuit Analysis Spurious Actuations. The Committee  
3 will hear presentations by and hold discussion with  
4 representatives of the staff.

5 Additionally, Mr. Alex Marrion with NEI,  
6 has requested ten minutes to share NEI's perspective  
7 after the staff's presentation.

8 The Committee had requested to review the  
9 generic letter regarding Post-Fire Safe-Shutdown  
10 Circuit Analysis Spurious Actuations after the public  
11 comment period. We did not have a prior subcommittee  
12 meeting on this letter which may have been a mistake.

13 I have serious reservations about the  
14 balance between regulatory burden and approved safety  
15 associated with this letter. The letter leaves open  
16 options for risk informing this process but they are  
17 not easy activities to perform. So we are anxious to  
18 hear what the staff has to say on this. And to have  
19 a healthy discussion, I believe.

20 We have a considerable period of time  
21 actually to do this, three hours. But I think that we  
22 will want to look into this letter very carefully  
23 before giving our blessing.

24 I think we are now ready to hear from  
25 staff. And I'll turn it over to Alex Klein of the

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1 Office of Nuclear Reactor Regulation.

2 MR. KLEIN: Thank you very much. My name  
3 is Alex Klein. You see on the cover slide here my  
4 branch chief's name, Sunil Weekakkody. He extends his  
5 regrets for not being able to attend today's meeting  
6 in that he had a prior commitment for jury duty today.  
7 With that, I'm acting in his place so I will give the  
8 opening presentation.

9 The purpose of today's meeting and the  
10 presentation to the Committee is to present the final  
11 draft of Generic Letter 2006-XX, Post-Fire Safe-  
12 Shutdown Circuit Analysis Spurious Actuations. We are  
13 also here to obtain ACRS endorsement to issue the  
14 proposed generic letter.

15 I'd like to introduce the two primary  
16 staff members who will present today for NRR. To my  
17 left is Robert Wolfgang who is the primary author of  
18 the generic letter. And to my right is Daniel  
19 Frumkin, fire protection engineer, from the Office of  
20 NRR, who will speak to you about some of the NEI and  
21 EPRI fire testing.

22 We also have in the audience with us  
23 supporting staff members from NRR who were also  
24 instrumental in the development of this generic  
25 letter.

1           As an overview, I wanted to advise the  
2           Committee that there is a lot of history leading up to  
3           this generic letter. And you will hear some of this  
4           today. We did a bounding analysis, full of risk. We  
5           also did a regulatory analysis of the generic letter.  
6           But at this time, those slides are not in our  
7           presentation. But we are certainly prepared to  
8           discuss those aspects.

9           MEMBER DENNING: We absolutely would like  
10          to see those slides.

11          MR. KLEIN: Very good.

12          So the probability of spurious actuations  
13          due to fires will be presented by Dan Frumkin after I  
14          speak. And then after Dan speaks, we will receive a  
15          summary of the objectives of the generic letter by Bob  
16          Wolfgang.

17          Again, based upon the long history of this  
18          generic letter and so forth, there has been differing  
19          views between the industry and the NRC on the  
20          credibility of multiple spurious actuations. You will  
21          hear about the NEI/EPRI cable fire test results from  
22          Dan Frumkin, as I indicated.

23          I also wanted to indicate to the Committee  
24          that we are continuing with our inspections using  
25          risk-informed aspects. For example, RIS 2004-03,

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1 certainly one of the goals of issuing this generic  
2 letter is to reestablish compliance with the  
3 regulations.

4 That concludes my introductory remarks.  
5 And I'll hand over the presentation to Dan Frumkin.

6 CHAIRMAN WALLIS: When you present, could  
7 you make it clear to me just what it is you are asking  
8 industry to do because I had a lot of trouble figuring  
9 that out. There is a lot of sort of rather vague  
10 requirements it seems to me. And perhaps you can in  
11 your presentation make it clear just what it is they  
12 have to do.

13 MR. KLEIN: Yes.

14 MR. FRUMKIN: Good morning. My name is  
15 Dan Frumkin from the Office of NRR. I work for Sunil.  
16 And today I'm going to present some of the background  
17 from the NEI/EPRI testing that is discussed in the  
18 generic letter.

19 I see some new faces around the ACRS table  
20 so I'm going to pass around some tables from some  
21 testing that occurred. At the end of the cables that  
22 are fused together, you will be able to see two  
23 failure modes or examples of two failure modes. One  
24 is an inter-cable which is two cables -- or actually  
25 one is an intra-cable, which we use these terms intra

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1 within a single cable and inter between two separate  
2 cables. And this provides an example of both.

3 The highlighted portions within a cable  
4 are very close together that have failed together.  
5 And then we also have intruding cable that has  
6 penetrated the outer jacket and apparently the inner  
7 cable protection and come at least into very close  
8 contact which you can see.

9 We will talk also about the different  
10 types of cable. This is a thermal plastic cable,  
11 which is the more vulnerable cable, but as you can  
12 see, that it is subject to both failures from internal  
13 and external cables when put under the suitable heat  
14 or fire exposure.

15 So I'll be providing some background on  
16 the testing that provided the insight into the failure  
17 likelihoods, the objectives of that testing, some  
18 details of the testing, some of the test results, and  
19 a few conclusions based on the testing.

20 And then Mr. Wolfgang will be talking  
21 about the generic letter more specifically.

22 The NEI/EPRI testing was intended to  
23 address fire-induced circuit failure issues of concern  
24 to the NRC staff, principally the potential for  
25 spurious operations of equipment.

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1           This was intended to basically bring to  
2 close the question that the staff kept on bringing up  
3 that Browns Ferry had these and the industry said that  
4 well, it is very unlikely to occur. So this was  
5 intended to bring that to a close.

6           NRC witnessed the testing and also did  
7 some insulation resistant testing using Sandia  
8 National Laboratory resources.

9           And there are four documents that either  
10 in whole or in part document the results of some of  
11 the testing. The characterization of fire-induced  
12 circuit failures results is the big report from EPRI.

13           The circuit analysis failure modes and  
14 likelihood analysis is the Sandia Report of their  
15 insulation resistant testing.

16           These results were pulled into the NUREG  
17 6850, which is the fire protection re-quantification  
18 or the fire PRA methodology for nuclear power  
19 facilities. This is the state-of-the-art document  
20 that Research has developed to -- it is a handbook on  
21 how to do fire PRA.

22           And then there was the spurious actuation  
23 expert elicitation which was experts reviewing the  
24 testing and coming up with results.

25           The objectives, as I said, was to research

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1 the characteristics of fire-induced circuit failures  
2 to better understand these plants' responses to cable  
3 failures. And, as I said, the NRC also was involved  
4 in the testing and reviewed -- witnessed the testing  
5 and did their own insulation resistant testing.

6 So the details of the test, there were 18  
7 fire tests that were conducted between January 9th,  
8 2001 and June 1st, 2001 at the Omega Point  
9 Laboratories in San Antonio. And the three types of  
10 fire exposures were tested during the test. The hot  
11 gas layer region which is up at the ceiling level, the  
12 fire creates a buoyant plume and it fills the  
13 enclosure from the top down. And that is the hot gas  
14 layer.

15 Then below -- between the fire -- the  
16 actual fire and the hot gas layer is what we call the  
17 plume region where there is no flaming but that is a  
18 very hot part of the -- that is the hottest part of  
19 the smoke region of the fire.

20 And they also tested a radiant exposure  
21 where you get close to the fire itself or sometimes  
22 worst case could be up next to the plume region  
23 depending on emissivity of the smoke and the radiant  
24 energy coming off. If it is a clean burning flame, it  
25 may not have a high radiant energy but the smoke may

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1 be higher. So -- but they just used, I believe, a  
2 fixed radiant number but that is a little discussion  
3 of the radiant energy.

4 One thing that they didn't do that I will  
5 add is they did not put cables in the flaming region.  
6 That is why I have this highlighted. We, the staff,  
7 hear a lot from the licensees about how long it takes  
8 to have these cables fail. And that there is plenty  
9 of time in all situations for mitigation.

10 And based on the testing, yes, in a lot of  
11 the testing there was a lot of time before there was  
12 failure in, you know, 30, 40 minutes for some of the  
13 tests. But none of the tests tested this flaming  
14 region.

15 So this leaves the staff a very strong  
16 question of how fast -- well, first we don't know what  
17 failures will occur in that region. They could occur.  
18 They may not occur. We don't have the information.

19 It is very clear that if they do occur,  
20 they will occur much more quickly. The temperatures  
21 are over, you know, much -- a thousand degrees hotter  
22 in the flaming region. And there is also an ignition  
23 source. So it is a very different phenomenon. And  
24 cables could be exposed to a flaming region in the  
25 plant.

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1           So this test is not a complete picture of  
2           -- or let me just say that the timing factors that  
3           came out of the testing that was done are not a  
4           complete picture of the possible scenarios that could  
5           occur.

6           MEMBER APOSTOLAKIS: It appears that you  
7           were participating in the conduct of these tests. Did  
8           you express these concerns to EPRI when they were  
9           designing the tests?

10          MR. FRUMKIN: Well, I wasn't specifically  
11          involved in that. I don't believe that the test was  
12          intended to develop timing. And as such, it wouldn't  
13          have been an issue. The licensees or the industry has  
14          brought this timing issue and perhaps inappropriately  
15          based on the testing.

16          It is useful to heat this cable slowly  
17          because then the hot shorts would probably exist for  
18          a longer period of time. But whether this -- but my  
19          only point is that I don't believe that this testing  
20          provides a basis to say that hot shorts -- this test  
21          I don't think was intended or can provide a basis for  
22          timing. But I believe it is being applied or some  
23          intend to use it to show that there is a timing issue.

24          MEMBER APOSTOLAKIS: I would be such an  
25          obvious thing to do. I mean there must be a reason

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1 why they didn't do it. Do you know that? Or should  
2 we ask Mr. Marrion when he comes?

3 MR. FRUMKIN: Why they didn't do the  
4 flaming region? Yes, that is a fair question. But I  
5 believe the answer -- like I said, I do think that  
6 that was not -- if there hadn't been any failures  
7 outside of flaming region, I think there would have  
8 been a strong feeling that failures in the flaming  
9 region would have been maybe less likely. But it is  
10 a fair question.

11 MEMBER APOSTOLAKIS: Okay.

12 CHAIRMAN WALLIS: Does the material from  
13 which the insulation is made, does that actually burn  
14 at some temperature?

15 MR. FRUMKIN: Yes.

16 CHAIRMAN WALLIS: But if you stuck it in  
17 a flame, you would expect the insulation itself to  
18 catch fire.

19 MR. FRUMKIN: Yes. The ASTM -- or, I'm  
20 sorry, the IEEE 383 fire test that has been the  
21 standard fire test is actually a burning test. And it  
22 ignites the flames from the bottom in a vertical cable  
23 tray. And all the cables do catch on fire when  
24 exposed to flame. But some of them propagate more or  
25 less slowly.

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1           There are some specialized cables that  
2 don't catch on fire but those were not tested. Those  
3 aren't what we are talking about here.

4           So the results of the tests showed with  
5 some confidence that failures within multi-conductor  
6 cables are likely and when they do occur, they occur  
7 in multiple conductors within the same multiple  
8 conductor cable. So as you can see from that cable  
9 bundle, there may actually be more than one cable  
10 conductor within the cable further down the jacket  
11 that you can't see.

12           And then the way they are spiraled  
13 together in there so that various cables could come in  
14 contact with other cables within the same cable.  
15 Various conductors could come into contact with other  
16 conductors within the same cable.

17           In addition, multiple devices were shown  
18 -- the spurious actuation data showed that a single  
19 hot short within a multi-conductor cable usually  
20 effected actuation devices simultaneously. If there  
21 were two devices -- I believe the way they set this  
22 test up is they wanted a very practical approach.

23           So they actually put -- rather than doing  
24 similar to the Sandia testing where they used an  
25 insulation-resistance device, they used actual plant

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1 equipment, which they just plugged it in as they would  
2 in the plant and if it would actuate or not actuate.  
3 So it was a real pragmatic thing and they did actuate.  
4 And as the testing showed, some actuated  
5 simultaneously.

6 MEMBER MAYNARD: Did they also measure how  
7 long the signal stayed there? Or how long it  
8 actuated?

9 MR. FRUMKIN: Yes. And most of the hot  
10 shorts were of a short duration. And some were in the  
11 order of minutes, I believe.

12 This is a table of results of the best  
13 estimates given cable damage of a spurious actuation  
14 probability. And the purpose of this table is not to  
15 -- the purpose of this table is just to show that the  
16 NRC and the industry -- or at least the results from  
17 the EPRI report which was developed by industry, are  
18 very consistent.

19 The staff and the risk people in industry  
20 really are on the same page with the likelihood of  
21 spurious actuations. There are some factors of two  
22 here, differences, but in probabilistic and  
23 likelihoods, in that world it is a small difference.

24 CHAIRMAN WALLIS: This is strange to me.  
25 It must depend on the extent of the damage. I mean if

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1 you just burn a cable for a short time, nothing  
2 happens. If you burn it for long enough, you are  
3 going to get shorts. So you can't just have a  
4 probability. It is going to depend on the extent of  
5 the damage to the cable.

6 MR. FRUMKIN: Yes. In all these, cables  
7 were exposed to damage. So this is given that these  
8 cables were damaged.

9 CHAIRMAN WALLIS: But to what extent?

10 MEMBER APOSTOLAKIS: It is a critical  
11 probability. I mean -- or, as you said earlier --

12 PARTICIPANT: At some point the  
13 probability is one, right?

14 MEMBER APOSTOLAKIS: I mean there is a 0.6  
15 conditional probability that you will have a spurious  
16 actuation. This is conditional on the probability  
17 that the cable is damaged.

18 MR. FRUMKIN: Correct.

19 MEMBER APOSTOLAKIS: And what is that?

20 MR. FRUMKIN: That depends on the  
21 scenario. For example, if a cable is a foot above a  
22 piece of switch gear or let's say -- and this is not  
23 an unlikely situation -- a foot above 20 or 30 feet of  
24 switchgear. It runs across the cable tray, across the  
25 top of a number of pieces of switchgear, what is the

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1 probability?

2 Well, that could be calculated typically,  
3 I think, a single piece of switchgear is five times E  
4 to the minus five. Or, you know, in that range. But  
5 then it certainly would be damaged if there was even  
6 a small fire in that piece of switchgear.

7 So there is -- you could have cable -- and  
8 then that same cable does go through different areas  
9 where it could be exposed to different other fires.  
10 A single cable could go through three, four, five  
11 different areas and be exposed to a dozen different  
12 fire scenarios.

13 MEMBER DENNING: I think we have to  
14 recognize the context within which this is done,  
15 George. And I think it is important when we try to  
16 get into the question of risk informing this and that  
17 is basically we are doing a deterministic safe  
18 shutdown analysis in which you assume there is a fire  
19 in a zone -- in a fire area. And it can burn there  
20 for three hours. You know even though there are other  
21 mitigating things that would clear that, we assume it  
22 can burn for three hours.

23 So then the question is well, with this  
24 massive potential exposure, then you have got a cable  
25 running through there. What's the potential that it

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1 could then be heated up to a point at which you get  
2 this kind of interaction? You know it doesn't get at  
3 all into the questions of you have a fire in a room,  
4 what is the possibility that any cables are exposed,  
5 you know, before it is controlled.

6 MEMBER APOSTOLAKIS: But if we are doing  
7 a deterministic analysis, why are we calculated  
8 spurious actuation probabilities?

9 MEMBER DENNING: Well, let me give my view  
10 but I'd certainly like to hear your view, and that is  
11 that the question is not so much whether you can have  
12 spurious actuations but how many can you have? How  
13 many combinations of things can you deal with?

14 The industry has always agreed to looking  
15 at a spurious actuation on a one-at-a-time basis, you  
16 know. And so I think that what the staff is trying to  
17 do is to give the feeling that -- or their impression  
18 that this isn't the really rare event -- the extremely  
19 rare event that actually would have some kind of  
20 spurious actuation occurring.

21 And then I think by implication then maybe  
22 there is the potential for multiple spurious  
23 activations.

24 MEMBER APOSTOLAKIS: Well, the second  
25 bullet of the previous slide, I guess, is then the

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1 key, right? Is that what -- of devices?

2 MEMBER DENNING: Well, I would be curious.  
3 What is your -- if you were answering that question,  
4 how would you have answered George's question? Why  
5 are we looking at probabilities here now?

6 MR. FRUMKIN: Well, okay, maybe this slide  
7 was poorly planned. But the point of the slide is  
8 twofold. One is to say that with regard to  
9 probabilities, the staff and the industry people who  
10 do this work are on the same page.

11 And the second reason, I guess, is to show  
12 that these probabilities are very high in  
13 probabilistic space, that some of them are close --  
14 you know, 0.6, and then if you have a 0.6 scenario and  
15 you have two 0.6 scenarios, you've got a 0.36  
16 scenario. So that even multiple can be a fairly high  
17 probable.

18 MEMBER DENNING: Now help us though -- you  
19 can't say that without giving some conditionality of  
20 --

21 MR. FRUMKIN: Right.

22 MEMBER DENNING: -- 0.6 conditions on  
23 what?

24 MR. FRUMKIN: Cable damage.

25 MEMBER DENNING: Cable damage.

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1                   MEMBER ARMIJO: I have a problem with  
2 cable damage. Is this severe? Moderate? I have no  
3 feeling of -- I can see where all the insulation is  
4 burnt to a crisp and I would call that severe.  
5 Wouldn't these probabilities all be one?

6                   MR. FRUMKIN: No. Well, okay, so what  
7 this is talking about is the spurious actuation  
8 probability, not shorting situation. This is the  
9 likelihood of a hot short occurring within a cable  
10 without that cable shorting to its conduit or cable  
11 tray because generally once the hot conductors fail to  
12 the conduit or cable tray or the nearest ground, then  
13 they would certainly -- that would clear the spurious  
14 actuation.

15                  MEMBER MAYNARD: Okay. But I think there  
16 is a high probability if you make all the assumptions  
17 to get to this point. But you also have to factor in  
18 the probability of actually having a fire, for the  
19 fire going that long, for the operators not taking any  
20 action. There are a lot of other things getting up to  
21 that point that when you put it all in context --

22                  MEMBER APOSTOLAKIS: That is why I'm  
23 confused. We are either doing deterministic analysis  
24 or we are doing risk analysis. If we do risk  
25 analysis, then, of course, we have to do all this. If

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1 we do what Rich said, then it seems to me they are  
2 gone.

3 I mean you have three hours. Everybody is  
4 burning, right? I think as I recall from the early  
5 studies on this the real question is whether you will  
6 have a short -- a hot short first before an open  
7 circuit.

8 MR. FRUMKIN: Right. Before the short  
9 ground.

10 MEMBER APOSTOLAKIS: That is the critical  
11 thing.

12 MR. FRUMKIN: Yes.

13 MEMBER APOSTOLAKIS: And this is not  
14 answering that, is it?

15 MR. FRUMKIN: Yes, it is.

16 MEMBER APOSTOLAKIS: It is?

17 MR. FRUMKIN: This is the likelihood of  
18 that spurious actuation probability, not a short to  
19 ground.

20 MEMBER APOSTOLAKIS: Okay.

21 CHAIRMAN WALLIS: This is one spurious  
22 actuation.

23 MR. FRUMKIN: This is a single.

24 CHAIRMAN WALLIS: A single one although  
25 there are multiple wires in the cable?

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1 MR. FRUMKIN: Right. Well, this is a  
2 spurious actuation getting cable to damage within a  
3 cable or between -- there is an inter-cable factors  
4 here -- between two cables. So the point -- let's  
5 just say the 0.6 here is for within a single thermoset  
6 cable, the 0.2 or the 0.4, as the 6850 has it, is  
7 between -- or generally it is 0.3 is what has been  
8 used a lot -- is between two separate thermoset cables  
9 within the same tray.

10 And what the previous slide was trying to  
11 say is that within a single thermoset -- within a  
12 single multi-conductor cable, that more than one of  
13 the conductors are going to fail together with an 80  
14 percent likelihood. So it almost for sure that if  
15 let's say you have one hot conductor and four control  
16 conductors that could actuate four different pieces of  
17 equipment, that hot conductor will come into contact  
18 probably with all of them with the same likelihood,  
19 with this same 0.6.

20 CHAIRMAN WALLIS: Oh, with the same  
21 likelihood?

22 MR. FRUMKIN: Yes. It's not a 0.6 times  
23 0.6 times 0.6 in the same cable. Within that cable it  
24 is 0.6 times 0.8, if you will.

25 CHAIRMAN WALLIS: Okay.

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1 MR. FRUMKIN: So it is still -- it is  
2 almost 0.6.

3 MEMBER DENNING: Why are the inter-cable  
4 probabilities the same for thermal plastic and  
5 thermoset?

6 MR. FRUMKIN: Because -- oh, you mean this  
7 and this?

8 MEMBER DENNING: Yes.

9 MR. FRUMKIN: Inter-cable -- yes, I'm not  
10 -- that's just a -- well, intra-cable is very likely  
11 --

12 MEMBER DENNING: Intra-cable, I understand  
13 that.

14 MR. FRUMKIN: Yes, I don't -- I don't have  
15 --

16 CHAIRMAN WALLIS: What is the question,  
17 Rich?

18 MEMBER DENNING: It's thermoset is less  
19 likely -- one would think thermoset would be less  
20 likely to have inter-cable and perhaps they are the  
21 same here because there just haven't been any  
22 experiments done on a thermoset.

23 MR. FRUMKIN: I think that is it because  
24 you can see that that is one of the big differences,  
25 a factor of two here, and again the same factor of two

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1 for intra-cable -- inter-cable -- but yes, we're -- as  
2 Roy Woods is here, and we're doing more testing on  
3 this. But this is currently the state-of-the-art data  
4 on this.

5 And I can't explain the -- it's just that  
6 is what the data showed from the limited 18 tests.

7 CHAIRMAN WALLIS: Now we are talking about  
8 whether you are doing probabilistic or deterministic  
9 analysis. When we get to the generic letter, there  
10 are strange terms such as saying the licensee must  
11 assume the possibility of simultaneous multiple  
12 spurious actuation -- well that tells me nothing.

13 I'm assuming the possibility -- it says  
14 nothing about whether it is likely to be one or 0.6 or  
15 whatever.

16 MEMBER DENNING: What they are saying is  
17 one.

18 CHAIRMAN WALLIS: What does it mean?

19 MEMBER DENNING: It means one.

20 CHAIRMAN WALLIS: So possibility means a  
21 probability of one?

22 MEMBER DENNING: That's -- yes.

23 CHAIRMAN WALLIS: That wasn't clear to me  
24 at all. Okay.

25 MEMBER APOSTOLAKIS: We will come to the

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1 letter, I guess.

2 MEMBER DENNING: Yes. Continue.

3 MR. FRUMKIN: These are just some notes on  
4 the previous slide that some of the plants that use  
5 the CPTs, which are the control power transformers,  
6 that reduces the likelihood of spurious actuations.

7 MEMBER APOSTOLAKIS: All of these  
8 probabilities, of course, mean nothing now.

9 MR. FRUMKIN: Right, yes.

10 MEMBER APOSTOLAKIS: They are one.

11 MR. FRUMKIN: Okay. Well --

12 MEMBER DENNING: But we are going to get  
13 to risk informing at some point here.

14 MR. FRUMKIN: Absolutely. Right. So  
15 those were just notes on the previous slide which was  
16 unfortunately put in here.

17 In conclusion, a review of the test data  
18 readily illustrates that hot shorts often involve more  
19 than one conductor. And that concurrent hot shorts  
20 within a cable are probable and should be considered  
21 during circuit analysis.

22 That's the end of this presentation. And  
23 the point of this is just to lay the groundwork that  
24 simultaneous spurious actuations and simultaneous  
25 multiple spurious actuations have been shown by

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1 testing, by industry testing, to occur.

2 MEMBER DENNING: Now there is more testing  
3 that is in progress. It is your feeling that that  
4 testing could then -- will it be done within a time  
5 period where we add value to the licensee when the  
6 licensee is basically responding the generic letter?

7 MR. FRUMKIN: Yes, that testing is planned  
8 to be done by the end of the year. And that pool of  
9 data will be available -- certainly for risk-informed  
10 evaluations for the licensees to use. But the experts  
11 doing the testing don't believe that there is going to  
12 be -- they believe these numbers are going to be  
13 honed.

14 They believe that there are going to be  
15 more cable combinations tested here than in the 18  
16 EPRI tests -- EPRI/NEI tests. But they don't believe  
17 that for the information that was on that table are  
18 going to be changed by an order of magnitude. It's  
19 maybe a 50 percent change or something of that nature.

20 MEMBER DENNING: If we have time later on,  
21 could we have a short presentation by someone about  
22 what is still to happen? And what different  
23 configurations basically have been untested at this  
24 point that will be tested?

25 MR. FRUMKIN: Well, Roy Woods is sitting

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1 behind you. And I'm not sure if he is prepared to  
2 talk about this testing.

3 MEMBER DENNING: Let me say I'm not asking  
4 for you to do it right now. But do you think you  
5 could do it later?

6 MR. WOODS: Sure. Roy Woods, RES. Yes,  
7 certainly we can make a presentation to you whenever  
8 you want on the testing. The plans are well made. We  
9 are about to start within days or a week at most. It  
10 is actually about to happen.

11 MEMBER DENNING: Okay. Well, let's go  
12 ahead --

13 MR. FRUMKIN: I think they want something  
14 later this morning, right?

15 MEMBER DENNING: Yes, later this morning.  
16 Absolutely, yes. Later this morning.

17 MEMBER APOSTOLAKIS: That's what happens  
18 when you have three hours.

19 MEMBER DENNING: Right, yes. Thanks. Can  
20 you run any of those tests by eleven?

21 MR. WOLFGANG: My name is Bob Wolfgang.  
22 I'm a fire protection engineer in NRR. And I'm going  
23 to give you information on the draft generic letter  
24 Post-Fire Safe-Shutdown Circuit Analysis Spurious  
25 Actuations.

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1           A summary of the presentation, I'll go  
2 over the purpose of issuing the generic letter, the  
3 information we are requesting from licensees, the  
4 background on this issue since 1997, the basis for the  
5 generic letter, the issue that is clarified in the  
6 generic letter, public comments, and a summary at the  
7 end.

8           The purpose of issuing the generic letter  
9 is to clarify how the NEI/EPRI cable fire test program  
10 reaffirms long-held regulatory positions and provide  
11 part of a foundation for licensees who are planning to  
12 transition to NFPA 805.

13           Also, to respond to the Agency's need to  
14 provide clarification and closure of outstanding fire  
15 protection issues, respond to --

16           MEMBER APOSTOLAKIS: Excuse me. Are you  
17 going to come back to these? I mean this on slide 16,  
18 the foundation for licensees planning to transition,  
19 will you elaborate on these later? Or can you tell us  
20 a few words now?

21           MR. WOLFGANG: Well, that's --

22           MEMBER APOSTOLAKIS: Why is that relative  
23 to NFPA 805?

24           MR. WOLFGANG: This is just to show that  
25 multiple spurious actuations should be included in

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1 their risk analysis model.

2 MEMBER DENNING: Well, since George has  
3 raised the question, let me ask it now. And that is  
4 NFPA 805 is one of the ways -- transitioning to NFPA  
5 805 is one of the ways that a licensee can respond to  
6 this. Now my question is how long does it take to  
7 transition to NFPA 805?

8 And I don't quite understanding within the  
9 time periods of the 90 days and six months and this  
10 kind of stuff, within the context of a transition to  
11 NFPA 805, when did that transition actually have to  
12 occur for the licensee to be able to use that pathway?

13 MR. WOLFGANG: All they have to do is  
14 respond to us within I believe it is the 90 days.  
15 That they are transiting to NFPA 805. And they will  
16 take care of this situation during that process.

17 MEMBER DENNING: Then how long would they  
18 have to transition to NFPA 805?

19 MR. WOLFGANG: They have -- what is it?  
20 Is it three years?

21 PARTICIPANT: Three years.

22 MEMBER DENNING: Three years?

23 MEMBER APOSTOLAKIS: Yes, it is a long  
24 time.

25 MR. KLEIN: Let me describe briefly. This

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1 is Alex Klein. Let me briefly describe the process a  
2 licensee would use if he wants to transition to NFPA  
3 805. And that is once the licensee had made the  
4 determination that he does want to transition to 805  
5 because that is an option for him, if he submits a  
6 letter of intent to the agency indicating that that is  
7 what he wishes to do.

8 At that point, we review that letter and  
9 make a determination as to whether or not the schedule  
10 that the licensee has laid out is acceptable to the  
11 Agency. And what we have right now in place is a  
12 three-year time frame for licensees to transition with  
13 the option of extending that time frame if the  
14 licensee can provide us with sufficient justifications  
15 beyond the three-year time period.

16 Now within that three-year time period, a  
17 licensee would submit their letter of intend, do the  
18 act of transition into NFPA 805. And then before that  
19 three-year time period is over, we would submit their  
20 license amendment to the staff for our review and  
21 approval prior to them actually receiving the  
22 amendment.

23 MEMBER APOSTOLAKIS: It seems to me that  
24 the -- actually is the first bullet in the previous  
25 slide that is important because the licensee that

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1 wants to transition to NFPA 805 has to convince you,  
2 I think, that they complied with all the regulations,  
3 right? There may be a few exceptions, as I remember  
4 for a period of time, and all that.

5 So the primary reason seems to be to  
6 reaffirm long-held regulatory positions because  
7 somebody who wants to transition has to demonstrate  
8 that they complied with all that.

9 MR. KLEIN: That is correct. Really I  
10 think the primary purpose of the generic letter is  
11 that first bullet on that slide 16.

12 MEMBER APOSTOLAKIS: Right, right.

13 MR. KLEIN: Yes. As an added benefit, it  
14 does provide the foundation for licensees who want to  
15 transition to 805.

16 MEMBER DENNING: Now wait a second. I  
17 definitely did not understand this. I mean clearly  
18 there are a lot of licensees out there that did not --  
19 cannot respond to multiple spurious actuations. And  
20 they are not going to have to bring their plant into  
21 compliance with having to meet all the multiple  
22 spurious actuations before going to NFPA 805 because  
23 then NFPA 805 doesn't help them at all, right?

24 MR. FRUMKIN: Yes, that is correct. And  
25 what Dr. Apostolakis was saying is correct is that we

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1 have an enforcement discretion in place so those  
2 licensees who discover during transitions that they  
3 are not in compliance can do a risk analysis of that  
4 and determine that it is not red, that it is not  
5 wilful, that it is not a severity one violation.

6 And, therefore, they can comp it -- put  
7 compensatory actions in place and move forward towards  
8 transition without necessarily correcting that in  
9 accordance with the old fire protection program.

10 MEMBER DENNING: But one thing that I  
11 think is an issue though and that is suppose there is  
12 a plant out there that would really like to do the  
13 NFPA 805 approach but within the 90-day period, don't  
14 they have to go through the entire analysis and  
15 identify the SSCs that are potentially vulnerable  
16 based upon this detailed multiple spurious actuation  
17 evaluation which seems to me like an extremely  
18 difficult problem to undertake.

19 Is that true that they have to really  
20 analyze the whole system within 90 days according to  
21 this multiple spurious actuations and identify  
22 vulnerable SSCs? Am I correct or not correct?

23 MR. WOLFGANG: Well, they have to -- well,  
24 I'll get to that on a slide here.

25 MEMBER DENNING: Okay, if you will get to

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1 it, you can go ahead.

2 MEMBER MAYNARD: I would like to challenge  
3 that first statement just a little bit though. And I  
4 know that it has been a long-held position by members  
5 of the staff but as far as, you know, NRC position,  
6 there are a number of licenses that were issued and  
7 plants inspected and with their programs were approved  
8 and licensed without making this assumption.

9 And I'm not convinced that it has clearly  
10 been a recognized regulatory requirement. And again,  
11 I know licenses were issued, programs were reviewed  
12 without making -- otherwise, we wouldn't even be here  
13 today if those licenses weren't issued at that time.  
14 So I would challenge that. The first statement.

15 MR. WOLFGANG: We know SERs have been  
16 issued for Byron and Braidwood with a single spurious  
17 actuation per fire event. And we've come to the  
18 conclusion basically that was issued as a mistake.  
19 That was a mistake.

20 MEMBER MAYNARD: But I know that there are  
21 a lot of plants out there a license. Their analysis  
22 were reviewed, their programs were reviewed. I know  
23 I was personally involved with them back in the '80s  
24 when some of these issues were starting to come to a  
25 highlight. And I know that there are a number of

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1 plants out there with licenses that although it may  
2 not be documented as clearly, that it was known that  
3 multiple spurious actuations were not taken in account  
4 in that analysis.

5 I don't think it is clear that this is  
6 just confirming compliance to requirements that were  
7 in place. I think it is a different set of  
8 assumptions.

9 MR. FRUMKIN: Yes, and this may, I agree  
10 that your assumptions apply to probably a number of  
11 plants out there. But for the most part, Appendix R,  
12 10 CFR 50, Appendix R, Section 3(g)(ii) and 3(g)(ii)  
13 which is the alternate and dedicated shutdown are what  
14 is in question.

15 The NRC went in and did an analysis of the  
16 3(g)(iii) alternate shutdown. And for a lot of  
17 3(g)(iii) which is, for lack of a better description,  
18 a control room abandonment, they allowed the  
19 assumption of one spurious actuation. 3(g)(ii) wasn't  
20 across the board inspected in the 80s. It was assumed  
21 that licensees could wrap or protect or would have  
22 adequate separation.

23 And it wasn't evaluated for multiple  
24 spurious because generally the staff didn't believe  
25 that -- well, I'm not sure why they didn't do it. But

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1 the big question was this alternate shutdown.

2 And in the 90s, we had the thermal lag.

3 And a lot of that wrap was taken out. And a lot of  
4 manual actions or assumptions were put into place.

5 And I don't mean to say that there was -- well, the  
6 point that I am trying to make is that there was  
7 another change. There was the removal of a lot of  
8 these thermal lag which was relied on to protect  
9 cables and probably would have mitigated many spurious  
10 actuations, many multiple spurious.

11 MEMBER MAYNARD: And I'm not saying at  
12 this point that they shouldn't be considered now. I'm  
13 challenging the regulatory positions that says all  
14 along everybody should have always done this. I think  
15 that, you know, we're now setting, you know, these are  
16 the things that definitely need to be considered.

17 If those were considered 20, 30 years ago,  
18 if that was part of the regulatory position for the  
19 licenses, we wouldn't have gone through a 20-year  
20 period here of trying to figure out what it really  
21 requires the licensee to do. Again, it's a regulatory  
22 -- I believe that this is something that falls within  
23 the backfit.

24 It needs a better analysis overall. And  
25 that doesn't mean that it is a bad thing to do. I'm

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1 just saying that I do not believe that we can take the  
2 position that this is a requirement that has already  
3 been there, that everybody should have already done.  
4 And that is kind of what we are saying in this generic  
5 letter.

6 MR. KLEIN: This is Alex Klein of NRR. I  
7 just wanted to add to the discussion here that -- and  
8 Bob can clarify this also for me -- is that the  
9 generic letter did receive CRGR approval. We did go  
10 to that Committee.

11 There are subsequent slides in Bob's  
12 presentation, I think 23, 24, 25, that does talk  
13 about the background, the regulatory background that  
14 you are speaking of that might clarify some of these  
15 discussion questions.

16 MEMBER MAYNARD: I'd be glad to look at  
17 that.

18 MR. WOLFGANG: Well, and also attend CFR  
19 Part 50, Appendix R, it also talks about you have to  
20 consider hot shorts. It doesn't set a limit on the  
21 number.

22 MEMBER MAYNARD: Well, I understand that.  
23 But there is a number of the regulations that come to  
24 an agreement between the licensee and staff as to what  
25 are -- what do you have to assume in a number of those

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1 things.

2 So anyway, we will get into it maybe aq  
3 little more with the regulatory evaluation. But I do  
4 not agree that --

5 CHAIRMAN WALLIS: Well, could we clarify  
6 this first bullet? I mean it seems to me that if we  
7 did have this long-held regulatory position, which was  
8 being enforced, then you wouldn't need this generic  
9 letter.

10 MEMBER MAYNARD: Right.

11 CHAIRMAN WALLIS: So something has changed  
12 as the result of these tests. So maybe there was a  
13 position which wasn't very well enforced or something  
14 or was not properly interpreted by the industry. Is  
15 that the problem?

16 MEMBER MAYNARD: Or the staff?

17 CHAIRMAN WALLIS: Well, the staff, yes.

18 MR. FRUMKIN: Well, I think we -- well,  
19 Bob, I think I would say that something did change.  
20 And that thing may not have been entirely the tests.  
21 I think that the staff had high confidence that these  
22 fire barriers that were installed were separating  
23 these redundant trains.

24 And they were removed and they were  
25 replaced with non-barrier solutions which were

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1 analysis, manual actions, and those type of things.  
2 And as soon as the NRC started inspecting post-thermal  
3 lag fixes, which was in 1997, well before these tests.  
4 We had numerous -- there was an information notice  
5 97-something which presented numerous hot short and  
6 multiple -- well, numerous alternate associated  
7 circuits and circuit failure type issues.

8 So to hang this entirely on the test is  
9 not -- certainly the staff position goes before -- to  
10 before the tests. And that has been documented in  
11 that generic -- that information notice and there was  
12 a letter sent to NEI which expressed this sentiment  
13 well before -- I believe that was before the test as  
14 well.

15 CHAIRMAN WALLIS: The purpose of the  
16 generic letter is to reinforcement your enforcement  
17 which you were a bit lax about before or something?  
18 Is that what its purpose is?

19 MR. WOLFGANG: There was a lot of  
20 confusion. You were talking about 3(g)(iii) about  
21 alternative and dedicated shutdown systems and the use  
22 of one only -- you had to consider one spurious  
23 actuation there --

24 MR. FRUMKIN: Right, 3(g)(iii) and the  
25 Generic Letter 86-10 talked about spurious actuations

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1 quite a bit but the staff position is that those  
2 didn't apply to 3(g)(ii) and they were erroneously  
3 applied to 3(g)(ii), which is all we're really talking  
4 about right now. We are not talking about these 3(g)  
5 (iii) inspections that occurred in the 80s. We're not  
6 talking about the 3(g)(iii) approvals.

7 Every 3(g)(iii) program should have been  
8 approved with an SER. That was the policy. But we  
9 did not go into the 3(g)(ii) areas because the  
10 barriers and those solutions should have been  
11 sufficient.

12 MEMBER MAYNARD: It just seems to me that  
13 with all the confusion that has gone on for a number  
14 of years on this, a much cleaner way of doing this is  
15 if the NRC believes that this is something that needs  
16 to be done is just to come out with it as a  
17 requirement following the process for rulemaking, for  
18 changes, or whatever rather than trying to handle it  
19 through a generic letter requesting information to  
20 show compliance with a very confusing set of  
21 requirements.

22 MEMBER-AT-LARGE SIEBER: I suspect,  
23 though, that the staff does not believe that  
24 rulemaking is required, that the proper regulations  
25 already exist.

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1 MR. FRUMKIN: That is correct.

2 MEMBER-AT-LARGE SIEBER: In the review  
3 process that the staff has used in the past does not  
4 establish new regulations. The regulations are the  
5 regulations. And how the staff reviews something is  
6 another matter.

7 MEMBER MAYNARD: Well, how they review it  
8 but what it is accepted as to your certain assumptions  
9 and things --

10 MEMBER DENNING: I'm sure we are going to  
11 come back to this issue. So why don't you go ahead --

12 MEMBER-AT-LARGE SIEBER: It won't go away.

13 MR. WOLFGANG: Okay, moving to the next  
14 slide, more purposes of issuing a generic letter,  
15 respond to the Agency's need to provide clarification  
16 and closure of outstanding fire protection issues,  
17 respond to the licensee's request to provide  
18 clarification of regulatory expectations, and respond  
19 to the region's request to provide clarification of  
20 regulatory expectations for circuit inspections. And  
21 circuit inspections were resumed January 2005.

22 Generic letter, what information it is  
23 requesting from the licensees. Within 90 days to  
24 evaluate their licensing basis and information in the  
25 generic letter regarding multiple spurious actuations

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1 in the Post-Fire Safe-Shutdown Circuit Analysis.

2 MEMBER MAYNARD: Is that practical to  
3 expect -- I think we might get into a little bit more  
4 as to what we are really asking here but within 90  
5 days, for the whole industry to do this, I'm sure  
6 there is going to be some resources -- external  
7 resources needed in some cases.

8 With the whole industry trying to use  
9 those, is 90 days really a practical time frame to get  
10 what is really being asked for here?

11 CHAIRMAN WALLIS: Well, we believe that it  
12 is. But, you know, I guess when NEI talks, they have  
13 a consensus from the industry that it is not a  
14 sufficient time, We can always adjust that.

15 MR. WOLFGANG: Yes, I think what is being  
16 asked here is not for the technical evaluation of the  
17 entire circuit analysis. What we are asking for is  
18 for licensees to report whether they have a multiple  
19 spurious licensing basis or they have a single  
20 spurious licensing basis.

21 For those plants that have a multiple  
22 spurious and haven't analyzed for multiple spurious,  
23 then that is going to be a long-term fix. All we are  
24 asking them to do is to report their situation within  
25 90 days, which is a licensing --

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1                   MEMBER DENNING: Wait a second. How do  
2 they submit their functionality assessment of effected  
3 SSCs without doing that total analysis? Am I missing  
4 something here? And this is within 90 days, if  
5 you're not in compliance, you have to submit this  
6 functionality assessment of effected SSCs.

7                   MEMBER APOSTOLAKIS: And compensatory  
8 measures.

9                   MEMBER DENNING: And compensatory  
10 measures. I think that is the whole analysis, isn't  
11 it? I mean you don't necessarily know how you are  
12 going to ultimately correct them but it seems to me  
13 that the analysis has to be done in 90 days.

14                   Incidentally, I should have mentioned that  
15 listening in is EPM, which is a company that does this  
16 kind of stuff. But I should have mentioned that  
17 earlier that we do have an open line here.

18                   I'm sorry, go ahead.

19                   MR. WOLFGANG: Yes, what we are asking --  
20 yes, to submit the functionality assessment of  
21 effected SSCs.

22                   MEMBER DENNING: Yes. How do you  
23 determine what SSCs are effected unless you have  
24 looked at the multiple spurious actuations.

25                   MR. WOLFGANG: Yes, they have to look at

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1 the multiple spurious actuations.

2 MR. FRUMKIN: First, I agree with the  
3 member that doing a full analysis for 104 plants in 90  
4 days is not going to be credible. This is a major  
5 effort to look at that.

6 I believe though that the second bullet of  
7 compensatory measures for these areas where the plants  
8 are capable of putting compensatory measures and then  
9 solving the problems in a long-term program. That is  
10 credible. That is possible.

11 MEMBER APOSTOLAKIS: It seems to me that  
12 the 90 days applies to the first bullet but not the  
13 sub bullets.

14 MEMBER MAYNARD: I think it does a -- it  
15 certainly applies to the first bullet.

16 MEMBER DENNING: But the sub bullets are  
17 there in the generic letter.

18 CHAIRMAN WALLIS: Well, why is there an  
19 assumption that they are not in compliance now? I  
20 mean that they have done various things today to meet  
21 the regulations already. And their position would  
22 probably be we are in compliance now. So what are you  
23 asking us to do?

24 MEMBER DENNING: No, I don't think so.

25 MEMBER-AT-LARGE SIEBER: Well, if you took

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1 the lag out of your plant --

2 CHAIRMAN WALLIS: That's the problem.

3 They have changed something.

4 MEMBER-AT-LARGE SIEBER: You changed the  
5 configuration.

6 CHAIRMAN WALLIS: That is okay. So they  
7 have changed something. Thank you.

8 MEMBER DENNING: It is not just that,  
9 Graham. They have argued that this has not been the  
10 requirement. That you didn't have to do multiple  
11 spurious actuations. They did one at a time or a  
12 single. So they would argue this is not the  
13 regulatory -- they would argue that it is new  
14 requirement but kind of like Otto has.

15 MEMBER KRESS: But the regulation says  
16 broadly that under these conditions, you have to have  
17 one train of safe shutdown. And that can only be  
18 interpreted as multiple spurious actuation I think.

19 MEMBER MAYNARD: I don't think -- I don't  
20 agree with that. Through the regulatory process, you  
21 don't necessarily have to assume everything that  
22 anybody could ever conceivably come up with. And so  
23 that's why the NRC and the industry -- but you decide  
24 on a set of assumptions. And what you really have to  
25 assume to reasonably meet that requirement.

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1           And then as new information comes along,  
2           if those previous assumptions weren't conservative  
3           enough, you may need to do that. But that really  
4           constitutes a change there. Otherwise why would you  
5           have any guidance documents or any -- what is allowed  
6           to assume or whatever. So I would argue that it is  
7           part of it.

8           MEMBER DENNING: In some respect, this is  
9           an open-ended problem in terms of, you know, and so it  
10          begs for some kind of guidance as to where you end the  
11          search for things that can go wrong.

12          Continue.

13          MR. WOLFGANG: We are asking that within  
14          six months to submit the plan to return all effected  
15          SSCs to compliance with the regulatory requirements.  
16          And that is the plant modifications, license .  
17          Exemption request.

18          And we are also asking that within 30  
19          days, if you cannot meet the 90-day, six month  
20          schedule that we are requesting, you provide us  
21          notification you cannot meet it and your suggested  
22          schedule and completion date.

23          CHAIRMAN WALLIS: What kind of things  
24          would they do to come into compliance? Are they going  
25          to change these offending cables? Are they going to

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1 change the way in which they put out fires? Are they  
2 going to change the actual equipment in the SSC? It  
3 is very open ended what they are expected to do.

4 MR. WOLFGANG: Yes, they can protect  
5 cables. They can reroute cables. They can submit  
6 license amendments based on a risk analysis method --  
7 those type of things.

8 CHAIRMAN WALLIS: Manual actions?

9 MR. WOLFGANG: Well, not in 3(g)(ii)  
10 space. There are a lot of ways.

11 MEMBER DENNING: I don't know how  
12 expensive those ways are. I mean we say there are  
13 lots of ways but those ways may be extremely  
14 expensive.

15 CHAIRMAN WALLIS: Well, I'm also unclear  
16 about what it is they are supposed to assume can go  
17 wrong? When I read these things about they are  
18 supposed to assume the possibility that this can  
19 happen, it goes back to Otto's question here.

20 I mean if you assume the very worst that  
21 could possibly happen, then you could have enormous  
22 changes in the plants in order to avoid this worst  
23 conceivable thing. Is that what you are asking them  
24 to do?

25 MR. WOLFGANG: You have to assume all

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1 multiple spurious actuations.

2 CHAIRMAN WALLIS: Well, but that is a  
3 major thing, isn't it?

4 MEMBER MAYNARD: That is major.

5 CHAIRMAN WALLIS: You have to assume that  
6 it happens with the probability of one?

7 MR. WOLFGANG: Yes.

8 MEMBER-AT-LARGE SIEBER: Yes. On the  
9 other hand --

10 MR. WOLFGANG: 3(g)(ii) in deterministic  
11 space doesn't limit the number of --

12 MEMBER-AT-LARGE SIEBER: On the other  
13 hand, you restrict the fire to a single fire area,  
14 which means that if you have appropriate separation or  
15 fire barriers that you have a train that is free of  
16 fire, that will operate.

17 MR. WOLFGANG: Right.

18 MEMBER-AT-LARGE SIEBER: And that is the  
19 principle. I think it is going to vary dramatically  
20 from plant to plant, especially based on the age of  
21 the plant and the type of plant. I think some are  
22 going to be tremendously impacted. Some others may  
23 not. And again, depending on what assumptions you  
24 really have to make and what credit you can take for  
25 things you already have in place, things that have

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1 already been done, everything from operator actions to  
2 fire loadings, improvement in fire control,  
3 everything.

4 MEMBER DENNING: And, Jack, you talked  
5 about the separating of trains. And that's, you know,  
6 pretty straight forward. But isn't the real open  
7 endedness related to the spurious actuations where  
8 there is some unanticipated valve opens that effective  
9 give you a loss of coolant accident or something like  
10 that, that, you know, introduces a different element  
11 to safe shutdown. Isn't that the open-endedness that  
12 makes it so difficult.

13 And I also don't know whether -- how many  
14 plants really know what cables are in what trays  
15 within a room.

16 Obviously if you are going to do -- yes so  
17 that you basically are assuming anything within the  
18 room -- I mean you know that -- you have concluded  
19 that it has gone through a room up to this point.  
20 But, you know, they could be in totally different  
21 trays in the room. But you don't know where they are  
22 in the room.

23 CHAIRMAN WALLIS: Well, you have to assume  
24 that they are all together and they are all --

25 MEMBER DENNING: Assume that you have to

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1 submit it. But I don't know the answer to that.

2 MEMBER KRESS: Assume that you have to do  
3 it. But I don't know the answer to that.

4 MR. WOLFGANG: Well in a fire area in a  
5 room, if you assume a fire, you have to assume  
6 everything is --

7 MEMBER KRESS: Yes, but can everything  
8 have an inter --

9 CHAIRMAN WALLIS: Everything in that room  
10 can short together?

11 MEMBER KRESS: -- can it short together as  
12 an inter-cable connection even though it may be way  
13 separated?

14 MR. FRUMKIN: No, if it couldn't occur,  
15 then it wouldn't be -- I mean you wouldn't have -- we  
16 wouldn't be expecting energized cables to penetrate  
17 conduits. We wouldn't expect energized cables to jump  
18 from tray to tray.

19 Or, for example, DC current has to have  
20 the same path. If it is not in the same tray or same  
21 conduit you couldn't actuate that from an AC circuit  
22 or something of that nature.

23 MEMBER DENNING: I don't know whether --  
24 what utilities know what cables --

25 MR. FRUMKIN: Right, no, you are correct.

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1                   MEMBER DENNING: -- are in what trays you  
2 were going to run.

3                   MR. FRUMKIN: And that can be a very  
4 significant effort.

5                   One of the aspects is that for the  
6 3(g)(ii) area -- or for the 3(g)(iii) plants, some of  
7 the older plants are 3(g)(iii). And they don't have  
8 very much separation at all. But they have done a  
9 significant analysis that was reviewed in the 80s  
10 which we referred to earlier. And they do have the --  
11 because they have done that detailed analysis, they  
12 have the flexibility to do manual actions.

13                   So in effect, the newer plants with the  
14 good separation should be fairly well off. The older  
15 plants that had very little separation probably have  
16 done a lot of this analysis already and may already be  
17 in compliance.

18                   It is the middle plants that are more  
19 likely than the older plants to have the circuits  
20 traced. But they are kind of in the middle there.  
21 And they are the ones who I think are going to be  
22 having a more difficult time answering this generic  
23 letter.

24                   MEMBER-AT-LARGE SIEBER: That is a pretty  
25 limited number of plants then. This issue is, you

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1 know, I was a young man when this issue came out. The  
2 work has been done. And the plants that were built in  
3 the 80s, to my knowledge they all had pull tickets  
4 associated with cables when they were originally  
5 routed.

6 So you just run your computer and it tells  
7 you whether you've got separation or not. And if you  
8 don't, what circuits are offending circuits.

9 MR. FRUMKIN: Many plants have that. Or  
10 some plants have that.

11 MEMBER-AT-LARGE SIEBER: Some plants have  
12 it. Some plants had to do that all manually, hand  
13 over hand.

14 MR. FRUMKIN: But I just want to add one  
15 thing that the staff has come our with a statement --  
16 or, well, not really a statement but what 3(g)(ii)  
17 says is that when cables of the redundant trays are  
18 within the same fire area and are not protected, so if  
19 you have a area with train A equipment in it and no  
20 train B equipment or the train B is protected in  
21 accordance with 3(g)(iii) protection criteria, we're  
22 not -- so with the train B protected, we're not  
23 limiting the actions that -- the feasible and reliable  
24 actions for failures on train A.

25 So if you have a protected train outside

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1 of a fire area or protected with 3(g)(ii), the  
2 licensees can do feasible and reliable manual actions  
3 on the fire-effected train to let's say close that  
4 valve that opens spuriously or stop that pump that  
5 opens spuriously because there is a full -- typically  
6 from the control room, so there is good annunciation  
7 and indication, there is a full protected train  
8 outside of that fire-effected area.

9 And I'll just point to Alex and see if he  
10 nods at me. Okay, yes.

11 MEMBER-AT-LARGE SIEBER: And there is very  
12 limited amounts of equipment if you had a spurious  
13 actuation, would cause another accident like a LOCA.  
14 Some value opens in the valve is -- like a safety  
15 injection valve, is designed to pump in not pump out.

16 Okay, so there are check valves and things  
17 like that that would prevent that. But there area  
18 few cases -- PRVs for example --

19 MR. FRUMKIN: Yes, PRVs is one I was  
20 thinking of if you --

21 MEMBER-AT-LARGE SIEBER: Yes , that could  
22 open and --

23 CHAIRMAN WALLIS: New plant designs have  
24 this screw valves. And the spurious actuation of them  
25 create a LOCA.

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1 MEMBER-AT-LARGE SIEBER: Yes, but they  
2 have them so you get to a safer condition, right?

3 CHAIRMAN WALLIS: One question I was going  
4 to --

5 MEMBER-AT-LARGE SIEBER: It is just  
6 expensive to do it.

7 MEMBER DENNING: Yes, is there any kind of  
8 assessment as to what fraction of spurious actuations  
9 actually are deleterious as far as effecting safe  
10 shutdown capability? I mean has anybody in a risk  
11 study done that kind of an assessment? Or do you have  
12 any feeling as to the fraction of spurious actuations  
13 that will get you into trouble?

14 MR. FRUMKIN: Well, you asked for that.  
15 We have this bounding analysis that we did and you  
16 actually -- well, you have to look at a lot to find  
17 the ones that are going to give you problems from a  
18 spurious actuation standpoint. But in our bounding  
19 analysis, it took five pairs of spurious actuations in  
20 order to get a significant risk.

21 And it is because these spurious system --  
22 these multiple spurious effect systems that, you know,  
23 are the redundant train. So it effects both -- the  
24 train, the productive train or the unprotected train,  
25 and the redundant train so you really lose all your

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1 protection with these scenarios. And it doesn't --  
2 you have to look at a lot to find the bad players.  
3 And there don't actually have to be a lot of bad  
4 players, at least based on our bounding analysis for  
5 it to be of fairly high risk significance.

6 MEMBER DENNING: Continue please.

7 MR. WOLFGANG: Background since 1997,  
8 multiple LERs brought lack of consensus concerning  
9 circuits to the staff's attention. And this led to a  
10 moratorium on inspection of circuit issues back in  
11 1997.

12 In 2001, NEI/EPRI cable fire test  
13 demonstrated that multiple spurious actuations can  
14 occur. And they can occur in rapid succession or  
15 simultaneously without sufficient time for mitigation  
16 in between.

17 Therefore if a licensee doesn't account  
18 for multiple spurious actuations, and its circuits  
19 analysis, the licensee may not be in compliance with  
20 10 CFR 50.48 and 10 CFR Part 50, Appendix A, General  
21 Design Criteria, and (3) which require that a licensee  
22 provide and maintain free from fire damage, one train  
23 of systems necessary to achieve and maintain the safe  
24 shutdown.

25 Staff has developed the risk-informed

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1 approach to inspections to focus on risk-significant  
2 configurations based on the cable fire test. And this  
3 is RIS 2004-003.

4 MEMBER DENNING: Now let me ask with  
5 regard to that, I understand that that was prepared  
6 for inspection as opposed to compliance.

7 MR. WOLFGANG: Correct.

8 MEMBER DENNING: But is there a real  
9 reason why one couldn't use guidance of that type for  
10 compliance as well? Do you see a regulatory  
11 constraint that would prevent you from -- I mean from  
12 the regulations that exist now, do you think it would  
13 be incompatible for the staff to provide the  
14 equivalent, perhaps a perturbation off of that or  
15 perhaps a revision to NEI's risk-informed guidance?  
16 Why can't we do that?

17 MR. WOLFGANG: I think the thing is we  
18 haven't seen licensee's risk tools, their model that  
19 we would have to approve prior to them using any risk  
20 analysis.

21 MR. KLEIN: Let me take a shot at  
22 answering the question maybe at a higher level. And  
23 that is with respect to licensees who are required to  
24 meet the requirements of Appendix R. Don't today have  
25 the ability to change that regulation or the

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1 commitment to that regulation based upon risk  
2 information.

3 If they want to do that, they would have  
4 to seek an exemption request from us against the  
5 regulation. They may certainly use risk information if  
6 they want to come in and see us with an exemption  
7 request, that is certainly open to them.

8 But what I think Bob is indicating is that  
9 a licensee may not make a change in their plant using  
10 risk information and making the conclusion based upon  
11 their standard license condition that says that, you  
12 know, it doesn't effect their ability to achieve and  
13 maintain safe shutdown.

14 The staff has been telling licensees that  
15 we would like them to come in and see us for such an  
16 exemption request or a license amendment.

17 MEMBER DENNING: Yes, I understand that  
18 that is the way -- that is the process by which they  
19 would use risk information to do that. But this first  
20 bullet is generic. It is generic information as to  
21 how many combinations of things or what are kinds of  
22 situations that are -- could be expected to be risk  
23 significant?

24 Now I realize it is not totally complete  
25 but it, you know, it gave guidance to the inspectors

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1 as to what are the combinations of things that could  
2 risk significant to look at and make sure. And I  
3 don't see any reason why one couldn't effectively rule  
4 out some of this total space of situations that the  
5 applicant has to look at to be compliant.

6 Now, you know, Tom is saying -- and I  
7 think it is kind of the regulatory position that  
8 you've got to look at everything because anything that  
9 can prevent this safe shutdown pathway is a potential  
10 problem. But you used it for the inspector to give  
11 him guidance on what is risk important and not in the  
12 area.

13 Couldn't you have done the same to provide  
14 generic guidance on this is how far you have to go in  
15 this process of looking at multiple spurious  
16 actuations.

17 MR. FRUMKIN: Bob, let me -- I'll be  
18 candid. We tried very hard to read 3(g)(ii) as a --  
19 to be risk informed in the way you describe. And with  
20 help from our lawyers, we were unable to get there for  
21 those pre-`79 plants. And then there is also the  
22 Agency or the Commission has approved a risk-informed  
23 rule.

24 And although it is more comprehensive,  
25 that is out there. And we considered the possibility

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1 of a risk-informed changed to this rule, to the  
2 current 3(g)(ii), and there is currently a rule that  
3 has been promulgated by the Commission. So that did  
4 not seem like a credible approach.

5 CHAIRMAN WALLIS: Well, could I follow up  
6 on that? And I looked at this risk informed approach.  
7 It seems to be just advice on vendors --

8 MR. FRUMKIN: Yes?

9 CHAIRMAN WALLIS: -- to focus on certain  
10 configurations. Well, that's okay. Focus on what  
11 matters. But then how does this inspector decide to  
12 reach some sort of a finding that something is not  
13 adequate? Or is not in compliance. That would get  
14 closer to tying these things together because the  
15 whole question here is what do they have to do in  
16 order to be in compliance.

17 MR. FRUMKIN: That is correct.

18 CHAIRMAN WALLIS: And how does the  
19 inspector know when they are in compliance or not?  
20 Well, he has just chose to focus on these things. How  
21 does he then decide when he is focused whether or not  
22 they are in compliance?

23 MR. FRUMKIN: And the answer to that is  
24 they pull up the licensing basis and if the licensing  
25 basis, if they do not have -- are not licensed for

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1 single spurious, that are considered to be -- required  
2 to look for multiple spurious.

3 CHAIRMAN WALLIS: Well then what are they  
4 supposed to do?

5 MR. FRUMKIN: Then that would be -- that  
6 could be -- that would be a finding would be run  
7 through the risk analysis of this STP. It would be  
8 cited. And the licensee would have to resolve a  
9 finding in the normal manner.

10 MEMBER DENNING: Incidentally, I think  
11 your last statement about their legal interpretation  
12 of pre-`79 is very important as far as our  
13 considerations are concerned because I mean it could  
14 be indeed that we are in a box in terms of whether you  
15 can risk inform the current regulation or whether you  
16 would need to change a rule which is obviously a huge  
17 undertaking.

18 CHAIRMAN WALLIS: Well, I'm really  
19 wondering, you made an initial statement that we  
20 should have had a subcommittee meeting. We seem to be  
21 at the level of behaving like a subcommittee so trying  
22 to determine whether or not you are ready to go to the  
23 full Committee because there seems to be so many  
24 questions here. And yet we are here as a full  
25 Committee.

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1                   MEMBER DENNING: That is why we have three  
2 whole hours.

3                   CHAIRMAN WALLIS: You know subcommittees  
4 sometimes have the option of saying you guys aren't  
5 ready. You shouldn't go to the full Committee. But  
6 they are here.

7                   MEMBER DENNING: The full Committee has  
8 that same option, doesn't it?

9                   MR. WOLFGANG: To continue, in 2004, staff  
10 held a public meeting in Atlanta to discuss the staff  
11 positions and solicit stakeholder feedback. We worked  
12 with NEI to finalize an acceptable industry guidance  
13 document for circuit analysis. And that was NEI 0001.

14                   Staff issued RIS 2005-30 to clarify  
15 regulatory requirements for a circuit analysis. And  
16 that RIS addressed the terms associated circuits, any  
17 and all, and emergency control stations.

18                   And this draft generic letter was issued  
19 for public comment in October 2005. We held a public  
20 meeting in March of this year. And the pertinent  
21 public comments were incorporated into the final draft  
22 of the generic letter. And we also received CRGR  
23 approval to issue the generic letter.

24                   The basis for the generic letter -- the  
25 bulleted review of NRC regulations, generic

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1 communications, correspondence related to this issue.  
2 And we have references identified in the generic  
3 letter. The results of the 2001 NEI EPRI cable fire  
4 test program, prior to the cable fire test, there was  
5 very little information available regarding circuit  
6 failure during a fire which made enforcement of the  
7 regulations in this area difficult. And also input  
8 from inspectors on issues that needed to be addressed.

9 The issue clarified in the generic letter  
10 is multiple spurious actuations. As Dan said earlier,  
11 some licensees claim that only a single spurious  
12 actuation had to be assumed in their circuit analysis.  
13 This was based on a misinterpretation of Generic  
14 Letter 86-10 in response to question 5.3.10.

15 And also some licensees claimed multiple  
16 spurious actuation occur with sufficient time in  
17 between them to take mitigating actions.

18 CHAIRMAN WALLIS: Now this  
19 misinterpretation has been going on for how long?  
20 D.L. 86 is 9/86?

21 MR. WOLFGANG: Yes.

22 CHAIRMAN WALLIS: Over 20 years they have  
23 been under some misapprehension about the regulations?

24 MR. WOLFGANG: That is my understanding.

25 MR. FRUMKIN: In this section of the

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1 generic letter, it refers to the 3(g)(iii) associated  
2 circuits I believe. So it took 3(g)(iii) alternate  
3 shutdown -- I'm sorry -- it took this 3(g)(iii)  
4 assumption and applied it to 3(g)(ii) areas. And that  
5 is what this misinterpretation is describing.

6 MEMBER APOSTOLAKIS: Let me understand it  
7 a little bit the second bullet here. Suppose there is  
8 sufficient time between actuations? Okay, so you have  
9 the first one. You really don't know what the second  
10 one is going to be, right? It could be anything.

11 MR. WOLFGANG: Second.

12 MEMBER APOSTOLAKIS: Oh, let's say there  
13 are two --

14 MR. WOLFGANG: Actuations?

15 MEMBER APOSTOLAKIS: -- spurious -- yes.

16 MR. WOLFGANG: Yes, based on these tests,  
17 they could occur --

18 MEMBER APOSTOLAKIS: No, I understand  
19 that, that it is a very short time.

20 MR. WOLFGANG: Right.

21 MEMBER APOSTOLAKIS: But let's assume for  
22 a moment that there is sufficient time, there is long  
23 time between them.

24 MEMBER DENNING: And there may be, George.  
25 There is a contention that --

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1 MEMBER APOSTOLAKIS: Okay.

2 MEMBER DENNING: Yes, right.

3 MEMBER APOSTOLAKIS: But you still don't  
4 know what the second one is going to be.

5 MEMBER DENNING: Is going to be, right.

6 MEMBER APOSTOLAKIS: So you can really  
7 take mitigations actions without know what the second  
8 will be?

9 MEMBER DENNING: Well, now wait a second.  
10 If you have mitigated the first one --

11 MEMBER APOSTOLAKIS: Yes.

12 MEMBER DENNING: -- then it is as if you  
13 now just have one.

14 MEMBER APOSTOLAKIS: Oh, so now you are  
15 going to get together and wait.

16 MR. WOLFGANG: And when the second one  
17 occurs and you have time to mitigate that one.

18 MEMBER APOSTOLAKIS: And this is doable?  
19 I mean has anybody looked into the details of this?  
20 It comes back to this issue of open endedness. You  
21 really don't know what is going to happen next. So I  
22 don't understand this particular -- I mean have they  
23 submitted details, you know, if you have sufficient  
24 time, you will protect the plant?

25 MEMBER DENNING: You know what I think

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1 would help us is we had some better feeling as to how  
2 do they really mitigate these actuations?

3 MEMBER APOSTOLAKIS: Yes, exactly,  
4 exactly.

5 MEMBER DENNING: What is a typical -- and  
6 I know there are constraints on manual --

7 MR. WOLFGANG: Yes, in 3(g)(ii), they  
8 can't use manual actions.

9 MR. KLEIN: Licensees have commonly used  
10 operator manual actions to mitigate that spurious  
11 actuation. They may send an operator out in a plant  
12 to close a valve or some such action like that. And  
13 then they wait for the next actuation and they say,  
14 okay, I've got plenty of time available to have taken  
15 that first action. And now they wait for the second  
16 action. And when that occurs, they send the operator  
17 out.

18 So I think that second bullet there is to  
19 just simply indicate to the Committee that that is the  
20 claim that some licensees have made. That is not  
21 necessarily a position that the staff agrees with.

22 MEMBER APOSTOLAKIS: No, I understand  
23 that.

24 MR. WOLFGANG: Yes.

25 MEMBER APOSTOLAKIS: But I'm trying to

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1 understand the position.

2 MEMBER DENNING: Now suppose you had --  
3 suppose it takes 30 minutes to have them get out there  
4 and close the valve, now obviously -- more than, you  
5 know, and then something else happens say before he  
6 closes that valve, then the real question is there a  
7 compounding effect?

8 MR. WOLFGANG: And I guess like --

9 MEMBER DENNING: As far as you don't have  
10 enough operators that you can send out to do all these  
11 --

12 MEMBER APOSTOLAKIS: The real question is  
13 is the length of time the critical variable here. And  
14 it doesn't seem to me to be.

15 MR. FRUMKIN: I mean we'll give you an  
16 example, for example if you have a -- you going to  
17 drain two valves in series that would drain the RWST  
18 and you also damage a number of other equipment. They  
19 fail. They short out and become unavailable.

20 Well, if you have -- if you lose the  
21 indication on the RWST and you open up the valve and  
22 you say you have plenty of time to -- you have  
23 indication the valve opened spuriously, you can go  
24 down and close the valve and then when the next valve  
25 opens, it has no effect.

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1 I think that would be an example of where  
2 they feel they would have sufficient time. Let's say  
3 the circuits are in cable trays -- you know, 20, you  
4 know, six cable trays above. There is going to be a  
5 good deal of time before the first cable tray is  
6 damaged and the next -- the first cable is damaged and  
7 then the next cable.

8 So -- and from a risk standpoint, you  
9 might be able to argue yes, we will have adequate  
10 indication that the valve opened and we have adequate  
11 time. And then that could be a risk-informed type  
12 analysis.

13 But if they are in the same cable, then  
14 they both could open simultaneously.

15 MEMBER MAYNARD: If there is time and  
16 there are a number of things they can do, when you  
17 have a fire in an area, you typically know what cables  
18 and what other things could be potentially effected in  
19 that and the manual actions going out either manually  
20 isolating valves, pulling breakers, a number of things  
21 you can do. But it is based on what is in that area  
22 or what could be effected with those in that area.

23 MEMBER APOSTOLAKIS: I remember when I was  
24 reading the analysis of the Browns Ferry fire a long  
25 time ago. They did have spurious actuations there did

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1 they not?

2 MR. WOLFGANG: Yes.

3 MEMBER APOSTOLAKIS: Within 20 minutes I  
4 believe they had all sorts of signals and so on. And  
5 then things started going dead. How does that  
6 experience fit into this?

7 MR. FRUMKIN: I think that experience is  
8 "the long-held staff position" that multiple  
9 simultaneous spurious actuations occur. I think when  
10 you want to point your finger to where we come up with  
11 that, it comes from 1975. It comes from the very  
12 beginning of fire protection regulation is that these  
13 spurious actuations occur.

14 And I think that -- unfortunately the  
15 statements of consideration for Appendix R are short.  
16 You know we have, you know, dozens of pages for a  
17 short NFPA-805 and there may be a dozen pages and a  
18 page maximum for 3(g)(iii) -- for 3(g) of Appendix R.  
19 So we really can't go back in time and pull out the  
20 basis for that. But we have Mark Sallies here, he  
21 might be able to shed some light on that.

22 But I believe that that is the long-held  
23 staff position is the Appendix R fire and these  
24 multiple spurious and rapid succession starting pumps  
25 giving incorrect indication, doing all sorts of

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1 unpleasant things to the plant.

2 CHAIRMAN WALLIS: The incorrect indication  
3 is a big problem. Something has happened and yet you  
4 don't know quite what has happened. That is another  
5 variable altogether from the time. I mean it is the  
6 uncertainty of knowing what is going on which might  
7 lead the operator to do the wrong thing.

8 MEMBER-AT-LARGE SIEBER: Yes, on the other  
9 hand, indications usually either go full scale or to  
10 zero.

11 MEMBER MAYNARD: A lot of times you've got  
12 multiple indications. And that is something they are  
13 trained on quite a bit is on instrument failures.  
14 That said, it is not uncommon to have an instrument  
15 failure without a fire. So they are trained on how to  
16 handle that.

17 MR. FRUMKIN: Right. One of the failure  
18 though they can also get -- and, again, there's  
19 multiple indications, but they could get an indication  
20 of a pump starting when it didn't start. Or a pump in  
21 a start and stop position and then that's going to  
22 take time for them to troubleshoot and whether it was  
23 started or stopped could it be adversely effecting  
24 overfilling the plant or not.

25 There are a number of timing issues that

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1 I'm sure they are trained on. But they can be  
2 potentially challenging.

3 MEMBER DENNING: Continue.

4 MR. WOLFGANG: The NRC letter from Sam  
5 Collins to NEI in 1997 stated that multiple spurious  
6 actuations caused by fire-induced hot shorts must be  
7 considered and evaluated. As I stated earlier, Byron  
8 and Braidwood have SCRs approving the assumption of a  
9 single spurious actuation for a fire event. So if the  
10 staff position is applied to them, it would be  
11 considered compliance backfit.

12 The generic letter --

13 MEMBER-AT-LARGE SIEBER: That's a unique  
14 case, those two plants.

15 MR. WOLFGANG: Yes, correct. The generic  
16 --

17 MEMBER APOSTOLAKIS: But what does that  
18 mean now?

19 MR. WOLFGANG: They are in compliance by  
20 definition.

21 MEMBER APOSTOLAKIS: You would say the SCR  
22 was not correct or what?

23 MR. WOLFGANG: They are in compliance by  
24 definition, right.

25 MEMBER APOSTOLAKIS: But I don't

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1 understand this compliance backfit.

2 CHAIRMAN WALLIS: Compliance by mistake is  
3 what I heard earlier.

4 MR. WOLFGANG: Well, by regulatory  
5 approval.

6 MEMBER APOSTOLAKIS: Can you explain the  
7 parenthesis? If stop position is applied to them, it  
8 would be a compliance backfit. You mean the current  
9 position?

10 MR. WOLFGANG: If they comply with their  
11 SER, the SER is approved even though it was a mistake,  
12 it would be a compliance backfit if we made them  
13 change.

14 MEMBER APOSTOLAKIS: So you would have to  
15 admit then that the SER was not correct?

16 MR. WOLFGANG: We have already admitted  
17 that.

18 MEMBER APOSTOLAKIS: Okay.

19 MEMBER MAYNARD: It is a matter of what  
20 regulatory process is used to actually do it. A lot  
21 fo people think backfit is a bad thing. I think it is  
22 a process that should be used a little bit more rather  
23 than trying to go around a lot of these things. Just  
24 say hey look, we've changed or this is a new  
25 requirement. Here's the regulatory burden. Here is

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1 the increased safety benefit. We are imposing this as  
2 the new requirement for you. It's not necessarily a  
3 bad thing. Just what regulatory burden --

4 MEMBER APOSTOLAKIS: But this doesn't  
5 happen too often, right? I mean --

6 MEMBER DENNING: What? Regulatory  
7 mistakes?

8 MEMBER APOSTOLAKIS: Yes.

9 MEMBER DENNING: Right.

10 CHAIRMAN WALLIS: Well, this last bullet,  
11 I have a lot of problem with. And they must be  
12 considered and evaluated. But it seemed to be very  
13 unclear about to what depth and by what methods these  
14 things must be considered and evaluated. That seems  
15 to be so open-ended that the licensee must be  
16 uncertain what he has to do.

17 MEMBER DENNING: RIS provides more detail  
18 than the generic letter does, right. The 2005 RIS.

19 MR. WOLFGANG: 2005-30?

20 MEMBER DENNING: Yes.

21 MR. WOLFGANG: Not on multiple spurious  
22 actuations, no.

23 MEMBER DENNING: No?

24 MR. WOLFGANG: It doesn't address that.

25 We didn't put that in there because we thought

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1 multiple spurious actuations because of this Byron and  
2 Braidwood SCR could be considered possibly a change in  
3 staff position. So that's why we didn't want to put  
4 it in a RIS.

5 CHAIRMAN WALLIS: There is no regulatory  
6 guide that says how to evaluate multiple spurious  
7 actuations?

8 MR. KLEIN: I think if I could respond to  
9 that question, I'll ask Dan also to pipe in. Is on  
10 page 7 of the generic letter where we do talk about,  
11 you know, ways that licensees can bring themselves  
12 into compliance, there is a discussion in there about  
13 the deterministic methodology or NEI-0001.

14 We do talk about the guidance in there in  
15 Chapter 3. We do say that for post-fire safe-shutdown  
16 circuits in conjunction with the guidance provided in  
17 this generic letter that NEI-0001 is one of the  
18 acceptable approaches to achieve regulatory compliance  
19 with the fire protection requirements for multiple  
20 spurious actuations.

21 So that's one example. And Dan can  
22 correct me if I've overstated this.

23 MR. WOLFGANG: And we say in conjunction  
24 with the guidance provided in this generic letter to  
25 mean consider multiple spurious actuation. I believe

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1 NEI-0001 says to consider two spurious actuations.

2 CHAIRMAN WALLIS: That doesn't mean  
3 anything to me. It could simply mean to say well I  
4 considered it and I think it is irrelevant or  
5 something. I mean what does consider mean? But what  
6 depth? By what methods?

7 MEMBER APOSTOLAKIS: To the depth required  
8 to convince the staff.

9 MEMBER BONACA: That is called open ended.  
10 We could fix it here but it seems to me that, you  
11 know, we do have a problem. And we are trying to  
12 figure out what is the best regulatory process to  
13 solve it. But the problem is there.

14 CHAIRMAN WALLIS: Well, I think we agree  
15 there is a problem. It is just whether or not there  
16 is a mature enough process in place to make something  
17 that is workable happen.

18 MEMBER BONACA: I understand.

19 MEMBER-AT-LARGE SIEBER: Well, this work  
20 has already been done once. The only thing that  
21 changed is the disqualification of certain fire  
22 barriers. All the licensees have done this. And it  
23 should be part of their licensing basis. There should  
24 be plant records as to how they did it the first time.

25 MEMBER DENNING: Really, Jack? I mean

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1 isn't there an issue here of the number of licensees  
2 who thought that they were really dealing with one  
3 spurious actuation requirement? Or one at a time?

4 MEMBER-AT-LARGE SIEBER: I can only speak  
5 to one licensee or about one licensee. And that was  
6 not the assumption.

7 MEMBER DENNING: That was not your  
8 assumption.

9 MEMBER-AT-LARGE SIEBER: No.

10 MEMBER DENNING: No. But there are  
11 licensees out there --

12 MEMBER-AT-LARGE SIEBER: Otto, was that  
13 yours? It is sort of obvious from Browns Ferry that  
14 you get more than one.

15 MEMBER MAYNARD: I'm trying to recall  
16 because the only place where we had different trains  
17 mixing was in the control room so it was primarily a  
18 control room-related issue.

19 MEMBER KRESS: But that is one purpose of  
20 the generic letter to find out the status.

21 MEMBER-AT-LARGE SIEBER: The only time the  
22 number of faults becomes an issue is when you are  
23 trying to solve the problem with operator manual  
24 actions. So now you've got too many things for too  
25 few people to do.

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1           But if you have train separation and the  
2 train separation is effective, you are going to get  
3 some spurious actuations which are going to be  
4 upsetting but not fatal. And you are still going to  
5 maintain a full set of safety equipment that  
6 functions. And that is the object of the fire  
7 protection regulation.

8           MR. KLEIN: I would strongly agree with  
9 what Dr. Sieber just indicated in that the focus here  
10 is on 3(g)(ii) compliance and that is where you've got  
11 the redundant trains in the same fire area as Dan had  
12 indicated. And Dan had indicated some of the history  
13 that, you know, led us up to this.

14           And that had to do with the resolution  
15 that some licensees used to address the thermal lag  
16 issue where they removed some of these fire barriers  
17 and in lieu of meeting the separation requirements of  
18 3(g)(ii), elected to put in place the use of operator  
19 manual actions.

20           And I think that is a very important thing  
21 to kind of keep in mind.

22           MEMBER-AT-LARGE SIEBER: But other  
23 licensees pulled no cable.

24           MR. KLEIN: That is correct. I'm not --

25           MEMBER-AT-LARGE SIEBER: They moved

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1 circuits out of the same fire area.

2 MR. KLEIN: Yes, I'm not suggesting that  
3 all licensees implemented unapproved operator manual  
4 actions in lieu of the requirements of 3(g)(ii).

5 There are other licensees who did plant modifications,  
6 did re-analysis, did re-wraps, pulled cables, what  
7 have you to bring themselves back into compliance with  
8 3(g)(ii).

9 MEMBER-AT-LARGE SIEBER: And some of them  
10 didn't use thermal lag to begin with.

11 MR. KLEIN: That is correct.

12 CHAIRMAN WALLIS: Well, I don't really  
13 have a good understanding of what kind of spurious  
14 actions we are talking about, what kind of operator  
15 actions in response we're talking about, and whether  
16 redundant trains solve the spurious action problem.

17 If I have a fire scenario and it switches  
18 on my high pressure injection, I've got a pump that  
19 runs and it is pouring water into the system, right?  
20 For one thing, I have to know -- I have to diagnose  
21 what is happening. Do I have to send somebody  
22 somewhere to shut a valve? And does that factor have  
23 some redundant train help me at all when something has  
24 been activated spuriously? I mean it is not clear to  
25 me what the range of kind of scenarios is that you are

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1 talking about here.

2 And whether redundant trains always help  
3 you or don't. Maybe they don't help you at all  
4 sometimes. And maybe the operator action sometimes is  
5 so severe that it is very difficult to take.

6 MEMBER MAYNARD: I think in most cases,  
7 there are things they can do. But there are some --  
8 and I think the power operator relief valve is one  
9 that if you have a system where you can't operate the  
10 block valve or the PRE, if it opens you basically have  
11 given yourself a small break.

12 CHAIRMAN WALLIS: That's what I think.  
13 When you think about TMR, they had a false indication  
14 because there was a light which said it was closed  
15 when it was open.

16 MEMBER MAYNARD: But most times you are  
17 still covered by -- I mean you are still analyzed for  
18 a small break LOCA or for the other events. A pump  
19 coming on, there are multiple ways to turn pumps off.  
20 And you are not going to be injecting water at such a  
21 rate that you have, you know -- I'm kind of talking  
22 more PWR than I am BWN here so I --

23 MEMBER DENNING: But it is those things  
24 though -- it is the multiplicity of those things that  
25 boggles my mind. You know rather than train

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1 separation and train protection which you talked  
2 about, it just seems like there is such a multiplicity  
3 of potential things and trying to analyze all those  
4 things seems almost open ended.

5 MEMBER-AT-LARGE SIEBER: There aren't --  
6 in sheer numbers, there aren't all that many safety  
7 circuits. And if you go underneath the control room  
8 into the faucet rafter, you'll find loads of jumpers  
9 and knife switches and things like that where you can  
10 de-energize control circuits.

11 Now one of the problems is that it  
12 actually, in a lot of circuit breakers, it takes power  
13 to trip it, you know. The trip coil requires  
14 energization so pulling a knife switch doesn't  
15 guarantee that it will run forever. And so the  
16 operator really has to understand how the control  
17 system is set up to be able to do that.

18 But there are ways to overcome these  
19 problems that don't require excursions all over the  
20 plant. And on the other hand, the plant is designed  
21 to be safe provided that you have a functional safety  
22 train. Separation criteria, if rigidly applied,  
23 provides that independent safety train.

24 MEMBER DENNING: We are going to now take  
25 our break until 20 after 10. And then we will have to

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1 move surprisingly quickly after that.

2 CHAIRMAN WALLIS: Okay. So we're going to  
3 take a break until 20 past 10.

4 (Whereupon, the foregoing matter went off  
5 the record at 10:09 a.m. and went back on the record  
6 at 10:23 a.m.)

7 CHAIRMAN WALLIS: Rich, would you resume  
8 the management of the meeting, please?

9 MEMBER DENNING: Please proceed.

10 MR. WOLFGANG: Okay. The last issue,  
11 clarifying the generic letter, the point we have here  
12 is the staff position on multiple spurious actuations  
13 presented in the generic letter is consistent with  
14 section 9.5.1 of the standard review plan.

15 Public comments. The significant public  
16 comment was that the generic letter constituted a  
17 backfit to licensees. And we addressed this comment.  
18 We obtained CRGR approval to issue this generic  
19 letter. And, as I said earlier, only for Byron and  
20 Braidwood, who have approved SERs that we know of,  
21 would this constitute a backfit.

22 Basically, this generic letter is just a  
23 request for information.

24 MEMBER MAYNARD: I would challenge that.

25 MR. WOLFGANG: Yes. I think --

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1                   MEMBER MAYNARD: That's all right. We'll  
2 comment on that.

3                   CHAIRMAN WALLIS: It isn't just a request  
4 for information. It asks them to do a lot of things.

5                   MEMBER MAYNARD: Yes. That is what I  
6 challenge, that statement. Yes. We've talked about  
7 it.

8                   CHAIRMAN WALLIS: That was what I was  
9 uncertain about.

10                  MEMBER DENNING: Why don't you go ahead  
11 and summarize, even though we're going to have a  
12 couple of other things? Why don't you go ahead and  
13 summarize? Then there are a couple of other things we  
14 would like you to -- we have more than started. We're  
15 almost done.

16                  MR. WOLFGANG: A summary. The generic  
17 letter, as I said before, is a request for information  
18 from licensees. The industry cable fire test program  
19 reaffirmed the staff interpretation of the regulatory  
20 requirements concerning multiple spurious actuations  
21 must be considered in the circuits analysis. The  
22 generic letter is necessary to ensure that all  
23 risk-significant circuit situations are identified and  
24 addressed.

25                  CHAIRMAN WALLIS: Could you go back a bit

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1 and say something about why this came about? I mean,  
2 wasn't this something to do with this thermal lag  
3 business? All of these installations, like Hemmicks  
4 and Eastern, every time we look at them --

5 MR. WOLFGANG: Yes.

6 CHAIRMAN WALLIS: Well, isn't that the  
7 solution would be to have a proper barrier around  
8 these things?

9 MR. WOLFGANG: That's one solution, yes.

10 MEMBER DENNING: I don't see that as a  
11 total solution. I don't --

12 MR. WOLFGANG: That is one solution.  
13 Another solution is a separation, 20-foot separation.

14 CHAIRMAN WALLIS: But in the past, when we  
15 believed that this thermal lag worked, there wasn't a  
16 problem. Is that right?

17 MEMBER MAYNARD: No. I think the problem  
18 was still there then. This has been bounced around  
19 since I know at least the early '80s as an issue. I  
20 think the thermal lag, it helped in some cases where  
21 you could show separation in the trains, but it  
22 doesn't necessarily take care of you if you've got  
23 cables in the same area that are --

24 MEMBER DENNING: Right. They can still  
25 give you spurious actuation, regardless.

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1 MEMBER MAYNARD: Right.

2 MEMBER DENNING: Now, it may be -- do you  
3 have any comments on that?

4 MR. FRUMKIN: Yes. If you have the  
5 separation, you can still get spurious actuations.  
6 And that's a box that we're not in with the rule. The  
7 rule does not require that those be protected. So all  
8 plants have the flexibility for the unprotected train  
9 to mitigate through feasible and reliable manual  
10 actions those types of spurious actuations.

11 Now, if you were to get a spurious  
12 actuation that were to give you all incorrect  
13 indication and was not recoverable, then that would  
14 still have to be resolved because it would be a  
15 potential safety issue. But for the minor ones that  
16 we have been talking about that would be fairly easy  
17 to resolve through a manual operator action or there  
18 are procedural controls or something of that nature,  
19 that would not be a compliance issue per se.

20 MEMBER DENNING: Help me with that because  
21 I still don't quite understand it. So if you have a  
22 protected train and you get a spurious actuation from  
23 an unprotected train, then you have to analyze all  
24 combinations of spurious actuations still, don't you,  
25 that are possible in that unprotected train?

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1 MR. FRUMKIN: Alex, do you want to?

2 MR. KLEIN: Yes, I believe you do because  
3 the over-arching requirement of appendix R is to be  
4 able to safely bring your plant to safe shutdown. And  
5 if you don't know what's occurring in your plant, then  
6 you can't meet that over-arching high-level goal of  
7 achieving and maintaining safe shutdown of your plant.

8 MR. FRUMKIN: And I will just say that  
9 once you have your protective train, your protected  
10 train, your unprotected train has a very limited set  
11 of things that could hurt you.

12 Now, we're talking we have plenty of  
13 water. We have plenty of indication. We have plenty  
14 of everything. But now we might open, we might cause  
15 a drain letdown path to open or we might cause a pump  
16 to start, but we should be getting clear indication of  
17 that in the control room. And in the normal  
18 procedure, process, you'll be getting indication of  
19 these things happening. And they should be able to  
20 mitigate them fairly effectively.

21 Now, there may be some things that would  
22 be difficult to mitigate. And, as Alex says, they  
23 have to find those and find a way to mitigate them.

24 MEMBER DENNING: So you have lots of  
25 things you have to analyze, but the mitigation of it

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1 is probably not too severe for the plant, and the  
2 plant is allowed to do manual action on it.

3 Now, there is another set here. So what  
4 is the other set? Aren't you always required to have  
5 a protected train?

6 MR. FRUMKIN: Yes. And these plants don't  
7 have that protected train. In effect, all circuit and  
8 manual action findings or potential violations are  
9 lack of protection, lack of circuit protection.

10 MEMBER DENNING: Circuit separation.

11 MR. FRUMKIN: So when --

12 MEMBER DENNING: Separation of the --

13 MR. FRUMKIN: Right. So when a finding  
14 comes in, let's say we have that hypothetical finding,  
15 which opens up and drains down the RWST. The citation  
16 is going to be against 3G2, lack of separation and  
17 lack of protection.

18 Now, we don't require one protection  
19 method over another, but they didn't put a protection  
20 method in there to protect the -- well, RWST is a bad  
21 example because it is not a necessarily one-train  
22 system.

23 But let's say you have both trains being  
24 affected by a fire. And here this is probably what is  
25 the more likely scenario. One train is just going to

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1 be damaged by the fire and not work, and then the  
2 other train is going to have the spurious actuation.

3 We don't necessarily need both trains to  
4 have spurious actuations. So that's the situation.  
5 It doesn't have to be multiple spurious on multiple  
6 trains.

7 MEMBER APOSTOLAKIS: Have we agreed that  
8 the first bullet is not quite correct? We're asking  
9 for more than just information?

10 MR. FRUMKIN: It's clear.

11 MEMBER APOSTOLAKIS: Yes.

12 MEMBER DENNING: It just takes them a lot  
13 of work to do it. I think we all recognize that it's  
14 a request for information, but in order to produce  
15 that information, you have to do a lot of work.

16 MEMBER APOSTOLAKIS: Right. It sounds to  
17 me like the priest saying, you know, "I know you're a  
18 sinner, George. Now, you go away and think of all the  
19 ways in which you could be a sinner and come back and  
20 tell me what they are." I have thought about it.

21 CHAIRMAN WALLIS: It's already been  
22 analyzed.

23 MEMBER APOSTOLAKIS: I protected myself.

24 MEMBER DENNING: Let's go on. And I would  
25 like to hear the conservative risk analysis. And so

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1 would you give us a little presentation on the  
2 conservative risk analysis?

3 MR. FRUMKIN: Are you done with all of  
4 your slides?

5 MEMBER DENNING: Yes.

6 MR. WOLFGANG: Yes. I just want to say  
7 one thing. If we don't issue a generic letter, we'll  
8 have to use the inspection process behind these  
9 problems.

10 It will take longer. We estimate three  
11 triennials, nine years. And some risk-significant  
12 items may be missed. We don't know because the burden  
13 is put on us, instead of the licensee. I just want to  
14 bring it up.

15 MEMBER DENNING: Thank you.

16 MEMBER BONACA: Is it with regard to the  
17 90 days with the responses? I mean, how did you come  
18 up with the 90 days, recognizing that you have to go  
19 to award to provide these responses? Was there an  
20 evaluation that you performed?

21 MR. WOLFGANG: No.

22 MEMBER BONACA: I mean, can it be changed?

23 MR. WOLFGANG: It can be changed. It was  
24 an arbitrary period that we thought was --

25 MEMBER APOSTOLAKIS: Or you can reduce the

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1 requirement.

2 MR. WOLFGANG: Yes, or we can --

3 MEMBER APOSTOLAKIS: So we don't have  
4 these?

5 MR. FRUMKIN: No, you don't have these  
6 slides. We will be making them available.

7 MR. KLEIN: Just as a reminder, if I can  
8 just follow up on the 90-day issue and the comments in  
9 regard to that, we do have a bullet in there that, for  
10 licensees who can't meet that 90-day requirement, that  
11 within the 30 days, they come in and request an  
12 extension.

13 MEMBER MAYNARD: Yes. And I saw that in  
14 the generic letter. If it's a situation where you  
15 know 90 percent of the industry is not going to be  
16 able to do it, you might as well be able to pick a  
17 date where everybody is not having to do it. I'll be  
18 interested in hearing from the industry as to whether  
19 they think that is a burden or not. I think I am  
20 assuming it is, but it may not be. So I don't know.

21 MR. FRUMKIN: This is a bounding risk  
22 analysis for multiple spurious actuations. It was  
23 developed for this meeting by Ray Gallucci, Dr. Ray  
24 Gallucci, who is in the Fire Protection Section. And  
25 it's been presented as a paper for the American

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1 Nuclear Society presentation. I think this winter  
2 they're having a meeting.

3 I am the third string presenter of this  
4 document. Ray is the first string. Dr. Weerakkody is  
5 the second string. And I'm presenting out of  
6 necessity.

7 MEMBER DENNING: Is Ray here to get beaten  
8 upon if he --

9 MR. FRUMKIN: No. Ray is on inspection at  
10 Browns Ferry. So we have --

11 MEMBER APOSTOLAKIS: Last time he was here  
12 he --

13 MEMBER DENNING: No wonder he's at Browns  
14 Ferry.

15 MR. KLEIN: Let me clarify. He's on a  
16 program review at Browns Ferry. He's not on an  
17 inspection.

18 MR. FRUMKIN: Okay. I'm sorry. These  
19 slides will be made available. My understanding of  
20 this analysis is using an older plant PRA that Ray was  
21 involved in, he pulled out some of the important  
22 measures for some hot shorts. And he recombined them  
23 into multiple hot shots and, using a simplification  
24 process, determined a bounding risk analysis for those  
25 based on those important measures for one plant's PSA.

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1           So this is the typical older nuclear power  
2 plant, has a fire CDF of  $3.3^{-5}$ . And they used a hot  
3 short probability of .1. They had modeled 24 of the  
4 basic events. And that contributed about 5 percent to  
5 the fire CDF or  $1.8D^{-6}$ .

6           And then there were some systematically  
7 symmetric redundant train components that were chosen  
8 because I think they had more of a larger impact on  
9 the plant risk if they were to fail together. And  
10 that was a contribution of .03 to the fire CDF, those  
11 10 items.

12           MEMBER DENNING: Let's go slowly so we --

13           MEMBER APOSTOLAKIS: Yes.

14           MEMBER DENNING: -- understand what we  
15 have here.

16           MR. FRUMKIN: Okay.

17           MEMBER APOSTOLAKIS: Twenty-four hot short  
18 basic events above truncation. What does that mean?

19           MR. FRUMKIN: That in the model, the ones  
20 that had remained as important remained having  
21 importance measures in the model, that there were only  
22 24 hot shorts that remained there.

23           MEMBER APOSTOLAKIS: The core damage  
24 frequency due to hot shorts is  $1.8 \cdot 10^{-6}$  per year, it  
25 says.

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1 MR. FRUMKIN: Correct, assuming a hot  
2 short probability of .1.

3 MEMBER APOSTOLAKIS: Which was low.

4 MR. FRUMKIN: Which is low based on  
5 current data.

6 MEMBER KRESS: Okay. So one, it would be  
7 1.8 times  $10^{-5}$ .

8 MR. FRUMKIN: If you said 1.0, correct.

9 MEMBER DENNING: Now, you said that that's  
10 low, but don't forget here that now we're talking  
11 supposedly real nuclear power plants with fires where  
12 you would take into account the fact that the fire may  
13 not damage any cables, you know.

14 MR. FRUMKIN: Right. Well, this is from  
15 an --

16 MEMBER DENNING: Oh, this is --

17 MR. FRUMKIN: -- old fire PSA. So this  
18 does consider --

19 MEMBER DENNING: Yes, it does.

20 MR. FRUMKIN: -- many of those factors.

21 MEMBER DENNING: But saying that the  
22 probability of your hot short is .1 and saying, "Well,  
23 that is low," I think because we saw those other  
24 things where people say, "Well, it could be .6 or .2  
25 or something like that," --

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1 MR. FRUMKIN: Right.

2 MEMBER DENNING: -- and, therefore, this  
3 is low, that doesn't necessarily follow.

4 MR. FRUMKIN: I think this is the  
5 conditional hot short probability based on cable  
6 damage.

7 CHAIRMAN WALLIS: How about multiple  
8 shorts come into this?

9 MR. FRUMKIN: That is what we are going to  
10 be talking about.

11 CHAIRMAN WALLIS: This doesn't address  
12 that?

13 MR. FRUMKIN: No, no. Right. This is  
14 what this analysis is. So assuming that the  
15 components within each pair -- these are those ten  
16 items that have been paired -- have similar failure  
17 characteristics and locations, including their cable  
18 runs, again, this is a conservative assumption and  
19 that these comprise the full set of candidates for  
20 multiple spurious actuations that are not specifically  
21 modeled in the traditional IPEEEs as --

22 MEMBER APOSTOLAKIS: The number you showed  
23 us earlier assumes that these happen independently?

24 MR. FRUMKIN: Yes.

25 MEMBER DENNING: You know, I still don't

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1 understand the pairing. What is going on here? Is it  
2 ten corresponding to --

3 MEMBER APOSTOLAKIS: Ten of these?

4 MEMBER DENNING: Five paired components.

5 That means that there is a --

6 MEMBER APOSTOLAKIS: Redundant elements.

7 MEMBER DENNING: They're redundant  
8 elements.

9 MEMBER APOSTOLAKIS: Yes.

10 MR. FRUMKIN: I believe what they did is  
11 of these 24, they took out 10 of them that could when  
12 combined have an issue.

13 MEMBER APOSTOLAKIS: They are still  
14 located in the --

15 MEMBER DENNING: It could lead to  
16 problems.

17 MR. FRUMKIN: On this slide, they're  
18 independent.

19 MEMBER APOSTOLAKIS: Yes.

20 MR. FRUMKIN: But I think what we're going  
21 to do is we're going to try to take out that and look  
22 at them as pairs. So this is what we're going to do,  
23 form a bounding analysis to estimate the potential  
24 maximum CDF due to multiple spurious actuations for  
25 this typical older MPP, which I think is what the

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1 target, the goal is here.

2 And now we start getting into some  
3 formulas. Per pair, one hot short corresponds to  
4 train A and the other to train B. So that's how they  
5 were paired. And they appear in symmetrically paired  
6 cut sets.

7 So one cut set, the CDF of A -- and  
8 there's the formula for that -- and the CDF of B,  
9 which is the fire initiator, and then the hot short or  
10 random failure of one of the paired components and  
11 then the summation of the B. Okay?

12 CHAIRMAN WALLIS: And where do the  
13 multiple shorts come in?

14 MR. FRUMKIN: This is the formula for --

15 CHAIRMAN WALLIS: It's between two trains,  
16 but it's not multiple shorts in the same cable.

17 MR. FRUMKIN: That's correct, not in the  
18 same cable.

19 CHAIRMAN WALLIS: It's still independent.  
20 And this formula that you have here, the cut sets, are  
21 still assuming that the --

22 MR. FRUMKIN: I think so. They're not  
23 going to be independent of the same fire and the same  
24 damage time, but they're going to be independent  
25 failures affected by the same fire.

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1 MEMBER APOSTOLAKIS: Conditional on the  
2 fire.

3 MR. FRUMKIN: Conditional on the fire.

4 MEMBER SIEBER: Which assumes the fire  
5 covers both things.

6 MR. FRUMKIN: Right, which is a  
7 conservative assumption in this analysis.

8 MEMBER SIEBER: Truly conservative.

9 MR. FRUMKIN: Yes.

10 MEMBER SIEBER: Improbable.

11 MR. FRUMKIN: Well, it depends on the  
12 design of the plant, but yes, it's --

13 MEMBER APOSTOLAKIS: So if I want to  
14 couple them, then, I will assume that Fa and Fb are  
15 just F, one fire. Is that correct? And then I will  
16 have --

17 MEMBER DENNING: A is --

18 MEMBER APOSTOLAKIS: Otherwise they are  
19 still independent. I mean, the fire initiator must be  
20 the same.

21 MR. FRUMKIN: Well, let's just hope that  
22 your answer --

23 MEMBER APOSTOLAKIS: We assume two  
24 different fires.

25 MEMBER DENNING: We'll go to the next

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1 slide. And maybe it will become clear.

2 MEMBER SIEBER: It's a lot clearer in  
3 here.

4 MR. FRUMKIN: Okay. So, again, we have --

5 MEMBER APOSTOLAKIS: This .1 comes from?

6 MR. FRUMKIN: The .1 was the  
7 state-of-the-art when they did this PSA of --

8 MEMBER APOSTOLAKIS: I'll tell you where  
9 it comes from.

10 MR. FRUMKIN: Okay.

11 MEMBER APOSTOLAKIS: That's 20 years or so  
12 ago.

13 MEMBER DENNING: You're responsible for  
14 .1?

15 MEMBER APOSTOLAKIS: I saw it, and I said,  
16 "Well, gee. How did you come up with that?"

17 So they said, "Well, call this guy"  
18 somewhere in California.

19 I called this guy. He says, "Well, you  
20 know Sandia told us that."

21 "What Sandia?"

22 "This person."

23 So I called this person in Sandia. He  
24 says, "Well, I really don't know. It's this other  
25 guy."

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1           So I called this other guy. And he says,  
2 "You told us that."

3           (Laughter.)

4           MEMBER DENNING: So we're going to accept  
5 the .1.

6           MEMBER APOSTOLAKIS: It wasn't followed up  
7 at all. I mean, that was the funniest thing.

8           MR. FRUMKIN: The IPEEE assumed this hot  
9 short probability of .1. And then I believe we're  
10 doing a simplification of these factors here. And it  
11 actually gets very simple on the next slide, but if  
12 anyone really wants me to read through this, I can  
13 try.

14           MEMBER DENNING: You know what we'll do?  
15 Let's go to the bottom line.

16           MR. FRUMKIN: The bottom line.

17           MEMBER DENNING: And we'll have copies of  
18 this.

19           MR. FRUMKIN: Okay. Yes.

20           MEMBER DENNING: And we'll --

21           MR. FRUMKIN: Okay. This is, I believe --  
22 well, let's see.

23           MEMBER APOSTOLAKIS: No. This is --

24           MR. FRUMKIN: This is the bottom line  
25 here.

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1 MEMBER APOSTOLAKIS: Go back a little bit.

2 MR. FRUMKIN: I think --

3 MEMBER APOSTOLAKIS: This Fa plus Fb I  
4 don't understand. I thought it was going to be 1.5.

5 CHAIRMAN WALLIS: That's two fires, isn't  
6 it?

7 MEMBER APOSTOLAKIS: This is one or the  
8 other, yes, one or the other.

9 MR. FRUMKIN: Yes.

10 MEMBER APOSTOLAKIS: It doesn't really --  
11 I mean, he should have assumed one fire as far as I  
12 can tell. But, again, the --

13 MEMBER DENNING: We will look at it  
14 carefully.

15 MEMBER APOSTOLAKIS: -- connection is  
16 nothing, I mean, right?

17 MEMBER DENNING: We will look at it  
18 carefully later.

19 MR. FRUMKIN: Right. That would be a  
20 small difference.

21 MEMBER DENNING: And Ray's bottom line  
22 again is?

23 MR. FRUMKIN: Okay. Well, what he does  
24 here is he's taking out the  $1.1E^{-6}$ . And he's putting  
25 in this value or coming up with this value of .011,

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1 which is his surrogate simplification for all of the  
2 fires and his X factor, which is his fire and his  
3 failure factor.

4 MEMBER APOSTOLAKIS: He's bounding the  
5 random failures, right, by assuming a  $10^{-3}$ , right?

6 MR. FRUMKIN: I believe so.

7 MEMBER APOSTOLAKIS: Yes.

8 MR. FRUMKIN: Typical, right.

9 MEMBER APOSTOLAKIS: But he doesn't know  
10 how many -- oh, this is a bound on all random failures  
11 that are required.

12 MR. FRUMKIN: Yes.

13 MEMBER DENNING: Continue. Let's see.

14 MR. FRUMKIN: Okay. And now he's talking  
15 about the dual failures. Any of the ten paired hot  
16 shorts would appear in the cut sets. And Fa is the S,  
17 which is your severity factor, which going to reduce  
18 your likelihood of more hot shorts, which is the  
19 likelihood of having a big fire that's going to cause  
20 this damage.

21 CHAIRMAN WALLIS: Which affects both  
22 trains?

23 MR. FRUMKIN: Right. And then your  
24 various factors, A hot, B hot short, and then your  
25 random factors.

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1 MEMBER APOSTOLAKIS: Why square? Why A  
2 hot times A hot? It still assumes that they're  
3 independent events, right?

4 CHAIRMAN WALLIS: Well, that is the A hot  
5 times B hot --

6 MEMBER DENNING: It is going to take us  
7 some time to really work through this. Rather than do  
8 this here, --

9 MR. FRUMKIN: Okay.

10 MEMBER DENNING: -- let's go see Ray's  
11 bottom line.

12 MR. FRUMKIN: Okay. The bottom line is  
13 here.

14 MEMBER APOSTOLAKIS: All right.

15 MR. FRUMKIN: So for his choice of fires,  
16 for severity factor, I think he used a .1 for this  
17 extreme fire, which is an S.

18 CHAIRMAN WALLIS: Why is .1 extreme? It  
19 could be .5.

20 MR. FRUMKIN: Oh, no, no, no. This is for  
21 the likelihood of a large fire.

22 CHAIRMAN WALLIS: Yes. But just asking  
23 George Apostolakis by telephone tag --

24 MR. FRUMKIN: Oh, no. This is not his .1.

25 CHAIRMAN WALLIS: I thought it was his .1.

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1 MR. FRUMKIN: It's somebody else's .1.

2 MEMBER APOSTOLAKIS: This is from one of  
3 my students.

4 MR. FRUMKIN: That's right. Right. This  
5 .1 is from very likely the fire protection STP, which  
6 says that severe fires happen or ten percent of all  
7 fires that happen are severe, which is, again, a  
8 conservative number based on the state-of-the-art,  
9 which is the 6850 analysis.

10 But that's what we're doing with -- I  
11 mean, this is no question about it. This is a  
12 bounding analysis.

13 CHAIRMAN WALLIS: The ones that cause hot  
14 shorts?

15 MR. FRUMKIN: No. Instead of using a  
16 severity factor of one, assuming that all fires will  
17 cause the damage, we're only assuming that ten percent  
18 of the fires will cause the damage to cause hot short.  
19 So there are many different ways of severity --

20 MEMBER APOSTOLAKIS: So this .011, .011,  
21 is the frequency of fire or, no, this is from the  
22 random failure?

23 MR. FRUMKIN: Right.

24 MEMBER APOSTOLAKIS: According to one is  
25 one?

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1 MR. FRUMKIN: That's the severity factor.

2 MEMBER APOSTOLAKIS: What is the frequency  
3 of fire?

4 MR. FRUMKIN: What I believe he has done  
5 is I believe he has back-calculated through his  
6 simplification that .1 that he used. And he's turned  
7 that, the whole -- all of his important measures into  
8 this .011.

9 MEMBER APOSTOLAKIS: So that includes the  
10 frequency of fire?

11 MR. FRUMKIN: I believe so.

12 MEMBER APOSTOLAKIS: That's a pretty high  
13 number.

14 MR. FRUMKIN: Yes.

15 MEMBER DENNING: We are going to look at  
16 this carefully, but his bottom line is saying, well,  
17 what this could do in this particular case is it could  
18 have increased by a factor of three the fire damage  
19 frequency.

20 MR. FRUMKIN: I think what he's trying to  
21 say here is that when he back-calculates from his  
22 importance measures and then he combines these pairs,  
23 that -- and this is the bottom line here -- he can  
24 have a maximum of  $10^{-4}$  per year due to these pairs of  
25 hot shorts.

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1 MEMBER DENNING: And without it, they had  
2 3 times  $10^{-5}$  is what this plant did.

3 MR. FRUMKIN: Yes. That's the whole fire  
4 risk for the plant, is 3 times  $10^{-5}$ . So this could be  
5 dominating.

6 MEMBER APOSTOLAKIS: But why couldn't you  
7 go to an actual PRA and fix, instead of whatever they  
8 had, and see what happens, rather than doing this  
9 undue analysis? I mean, there are detailed fire PRAs  
10 out there.

11 MR. FRUMKIN: We don't actually have one  
12 in the office. He did have this information available  
13 to him.

14 MEMBER DENNING: What I would like to do  
15 is we would definitely like copies. Don't go  
16 anywhere.

17 MR. FRUMKIN: Okay.

18 MEMBER DENNING: And I don't think you  
19 have to read that. What we would like -- I mean, you  
20 can actually --

21 MR. FRUMKIN: Well, here his last slide is  
22 at least for a typical older nuclear power plant, one  
23 cannot a priori dismiss multiple hot shorts of being  
24 of lower significance.

25 MEMBER DENNING: Okay.

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1 MEMBER APOSTOLAKIS: Well, I would like to  
2 see the paper, please. No, no. Give me a copy.

3 MEMBER DENNING: Right. Yes, if we may.  
4 What we would like to do now is we would like to hear  
5 now from NEI, if we could. Don't run away, Research.

6 MEMBER APOSTOLAKIS: Don't anybody go  
7 away.

8 MEMBER DENNING: Don't anybody leave town  
9 other than me, but I would definitely like to make  
10 sure we have plenty of time to hear from NEI.

11 MEMBER APOSTOLAKIS: That's what I call  
12 running and meeting with --

13 MEMBER DENNING: The policeman is asked to  
14 lock the doors.

15 MEMBER APOSTOLAKIS: We have a cop  
16 outside?

17 MEMBER DENNING: And, Alex, you don't have  
18 handouts, but we can make them. Is that a true  
19 statement?

20 MR. MARRION: No, I do not have handouts.  
21 I do have a couple of comments.

22 MEMBER DENNING: You have comments?

23 MR. MARRION: Yes.

24 MEMBER DENNING: But you don't have any  
25 papers?

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1 MR. MARRION: No.

2 MEMBER DENNING: Okay. Please proceed.

3 MR. MARRION: Good morning. My name is  
4 Alex Marrion. I am a Senior Director of Engineering  
5 at NEI, and I appreciate the opportunity to offer a  
6 couple of comments on our perspectives on what we  
7 heard this morning.

8 Before I begin, I want to point out that  
9 we have two utility representatives, one from Progress  
10 Energy and one from Duke Power, who represent the two  
11 pilot plants for the application of NFPA 805.

12 And if the Committee so desires, I think  
13 it may be useful for you to understand the  
14 implications of this generic letter on the NFPA 805  
15 risk-informed application process. And I'll defer to  
16 you to --

17 MEMBER DENNING: We so desire.

18 MR. MARRION: Okay. Very good. Now I'll  
19 ask them to step up when I finish my comments.

20 To get back to Dr. Apostolakis' --  
21 George's comment, --

22 (Laughter.)

23 MR. MARRION: -- the test protocol and the  
24 issue of having cables exposed in the flaming region,  
25 I don't have any direct knowledge of that discussion

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1 with the NRC staff at the time we developed the test  
2 protocol. This was the first I heard of it, but I'll  
3 look into it. And we'll try to get an answer to you  
4 at the end of the week.

5 I do want to make it clear that we believe  
6 the multiple spurious actuation is a new regulatory  
7 position that results in significant impact on utility  
8 licensees, not only on the Appendix R, the NUREG 0800  
9 plants but also on the NFPA 805 plants.

10 The impact is significant in that it  
11 changes the methodologies that the utilities have  
12 credited in their licensing basis over the last 20  
13 years. So the licensing basis has to change.

14 Now, with that, it's perfectly appropriate  
15 for the NRC to say, "There's new information that has  
16 been brought to bear on this topic. And we have a new  
17 position." That's fine. But the NRC must bear the  
18 burden of demonstrating the safety impact of that new  
19 position and do a regulatory analysis to substantiate  
20 it because of the significant implications on the  
21 utility licensee design basis.

22 That's straightforward, but one thing that  
23 this position does not take into account is the  
24 fundamental elements of defense-in-depth relative to  
25 fire protection. What I'm talking about is the

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1 actions that are taken by licensees in preventing  
2 fires from occurring and detecting a fire when it does  
3 occur, having systems and personnel to respond to the  
4 fire to mitigate the consequences of the fire,  
5 suppression and detection systems, and then ultimately  
6 recovering the plant to assure that you can get into  
7 a safe condition.

8 We understand there is value to looking at  
9 risk-informed approaches and changes and assumptions  
10 and evaluating them accordingly, but I would recommend  
11 that we not lose sight of the defense-in-depth  
12 concepts as we go through this process going forward.

13 This generic letter is another example of  
14 what is fundamentally flawed with fire protection  
15 regulations and has been a problem with fire  
16 protection regulations and the associated regulatory  
17 process over the last 25 or 35 years.

18 And by that, I mean we have a continuous  
19 evolution of NRC positions and expectations that are  
20 addressed in a somewhat informal manner. And by that,  
21 I mean use of generic communications to articulate  
22 regulatory positions is, quite frankly, inappropriate.

23 New regulatory positions should be  
24 evaluated in terms of safety impact or clearly  
25 demonstrating the compliance issue associated with

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1 that new position. Then that has to be made publicly  
2 available so that the licensees can understand what  
3 these new positions are and what the basis for the  
4 positions are.

5 Historically in fire protection, it's been  
6 a plant-specific fire protection engineer from the  
7 licensee to an NRC inspector agreement of what the  
8 understanding is relative to an interpretation. And  
9 that is the problem that we're trying to fix. That's  
10 why we are so firm in our comments going forward,  
11 because fundamentally, gentlemen, if we don't address  
12 or we don't identify resolution to the spurious  
13 actuation issue today, it will be an issue for the  
14 NFPA 805 plants.

15 Going to 805 does not provide a resolution  
16 to this issue today because there is no understood  
17 methodology that can address the staff's position. I  
18 want to make that very clear.

19 MEMBER APOSTOLAKIS: Is this the  
20 open-ended issue that we discussed earlier?

21 MR. MARRION: Yes, yes. The comments made  
22 about CRGR approval of this generic letter, as an  
23 external stakeholder, that essentially is meaningless  
24 to us, reason being we are not privy to any kind of  
25 disciplined process that is used by CRGR or anyone

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1 within the NRC that clearly demonstrates this is the  
2 basis for the safety concern or this is the basis for  
3 the compliance concern.

4 What we have seen over the years -- and  
5 this is another example -- where the preferred route  
6 appears to be, well, let's make it a compliance  
7 concern because we as a regulatory agency, the NRC,  
8 can interpret the regulations. We have the right to  
9 interpret the regulations, et cetera, which is fine,  
10 but let's put the interpretation on paper. Let's  
11 identify resolution path so we have a common  
12 understanding going forward. We don't have that today  
13 on this particular issue.

14 Lastly, I would like to say that there  
15 isn't a generic letter that is simply a request for  
16 information. It should be clear from the discussion  
17 this morning that this generic letter basically  
18 imposes a new regulatory requirement that has  
19 significant impact on the licensing basis of current  
20 plants. That is not a request for information.

21 Those are the comments that I wanted to  
22 make this morning. I don't know if you have any  
23 questions on anything I said.

24 MEMBER DENNING: Yes, we do have some.  
25 One of them has to do with the timing, the 90 days,

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1 and the timing required to do the kind of analysis  
2 that's being requested there. Do you have a feeling  
3 as to what an appropriate time would be?

4 I mean, there's a timing that says, are  
5 you in compliance with this, which, regardless of this  
6 question, whether it's a new regulation or an old,  
7 there's no question the plant can determine that  
8 fairly quickly. But doing the entire analysis and  
9 determining what affected SSCs are, do you have any  
10 indication from the plants as to how much time that  
11 might take and what an appropriate time frame would be  
12 for a response like --

13 MR. MARRION: I don't have the information  
14 to answer the question, but I would submit that the  
15 next two individuals may be able --

16 MEMBER DENNING: May be of help on it?

17 MR. MARRION: -- to give you their  
18 perspectives.

19 MEMBER DENNING: Okay. Good.

20 MEMBER MAYNARD: Could I just --

21 MEMBER DENNING: Yes?

22 MEMBER MAYNARD: Your perspective comment  
23 was made that if the generic letter is not issued,  
24 then it would just have to be dealt with in inspection  
25 space. Do you have any comment on that?

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1 MR. MARRION: It is being dealt with in  
2 inspection space. Now, what we don't have is an  
3 external stakeholder. When I mention "we," I'm  
4 speaking of NEI and the industry. What is the safety  
5 case or what is the compliance case? And we haven't  
6 seen evidence of that clearly demonstrated that NRC  
7 action in this particular area is necessary in an  
8 expedited manner.

9 VICE CHAIRMAN SHACK: Just to address your  
10 methodology question, apparently you can deal with  
11 multiple actions if they come sequentially. So you  
12 have a methodology for that. And you're arguing that  
13 there isn't a methodology.

14 So it isn't necessarily the open-endedness  
15 of it that's the problem?

16 MR. MARRION: There isn't a methodology  
17 for addressing all spurious actuations in a given  
18 fire. Utilities had --

19 VICE CHAIRMAN SHACK: You can address them  
20 one at a time.

21 MR. MARRION: You can address them one at  
22 a time. And I would ask that the two utility  
23 representatives explain their methodology for circuit  
24 analysis. I think we would find that very insightful.

25 MEMBER DENNING: Good.

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1 MR. MARRION: But it's changed. And then  
2 what I would like to do is ask Dave Miskiewicz from  
3 Progress Energy and Harry Barrett from Duke Power.

4 CHAIRMAN WALLIS: I would bring up the  
5 point before you leave --

6 MR. MARRION: Yes?

7 CHAIRMAN WALLIS: You talked about the  
8 role of a generic letter and whether it just requests  
9 information. We have another generic letter on sumps,  
10 which you may be aware of, right?

11 MR. MARRION: I am generally aware of that  
12 one.

13 CHAIRMAN WALLIS: It not only requested  
14 information. It requested analysis, and it requested  
15 plans. And, in fact, it's resulted in large changes  
16 in the plant by a result of a generic letter.

17 MR. MARRION: Yes.

18 CHAIRMAN WALLIS: So it's not as if this  
19 is a unique generic letter, which is actually asking  
20 plants to do much more than just supply information.

21 MR. MARRION: My only point is a request  
22 for information as this generic letter is  
23 characterized as a mischaracterization of what its  
24 impact is.

25 CHAIRMAN WALLIS: Well, it clearly isn't

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1 that. I mean, it says a request for information and  
2 taking additional actions. I mean, the sentence asks  
3 for more than just information.

4 MR. MARRION: Okay?

5 MEMBER DENNING: Okay. Let's have our  
6 visitors come up.

7 MR. FRUMKIN: If I could add? This is Dan  
8 Frumkin. Just one point. The inspections started  
9 again in January of 2005, but there is still currently  
10 enforcement discretion for all circuit findings. And  
11 so there may be a perception that this has not turned  
12 into an issue yet because of a lack of enforcement in  
13 this area.

14 So starting in September 2006, enforcement  
15 will proceed for plants that do not have enforcement  
16 discretion under NFPA 805. So I just want to put that  
17 out there that currently there are no enforcement  
18 actions in this area for plants that take compensatory  
19 measures and have correction action plans.

20 MEMBER DENNING: Introduce yourselves,  
21 please.

22 MR. BARRETT: Good morning. My name is  
23 Harry Barrett. I work at Duke Power. I'm the  
24 three-site lead for NFPA 805 transition for all three  
25 of these sites in Duke Power's nuclear fleets. I just

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1 wanted to say a few words about the multiple spurious  
2 issue as it affects 805.

3           Although 805 is a risk-informed,  
4 performance-based rule, it is based on your current  
5 licensing basis going forward. And if that is  
6 questionable, then your regulatory foundation that  
7 you're billing it on would be questionable in 805,  
8 which ends up leading to a lot more effort and a lot  
9 more analysis required for that.

10           So this multiple spurious issue is adding  
11 a significant amount of paperwork and analysis to 805  
12 transition. The original concept was you would take  
13 your fire protection licensing basis, map it over to  
14 the 805 requirements, and it was pretty much just a  
15 paper transition.

16           With this new multiple spurious and the  
17 complications that that adds to the fire PRA, we're  
18 looking at a significant amount of engineering effort  
19 that goes into that.

20           It's going to take us over two years to do  
21 the transition for Oconee, which is the first plant.  
22 And a lot of that, most of that, is the PRA in the  
23 multiple spurious issue.

24           MEMBER APOSTOLAKIS: Do you agree that it  
25 is an issue?

1 MR. BARRETT: I agree that it needs to be  
2 looked at. I have not seen a multiple spurious  
3 scenario that is risk-significant yet.

4 MEMBER APOSTOLAKIS: Do any of your plant  
5 have a detailed fire PRA?

6 MR. BARRETT: We have a fire PRA. We have  
7 --

8 MEMBER APOSTOLAKIS: Not IPEEE, though?

9 MR. BARRETT: We had an early '80s vintage  
10 fire PRA, but we are putting together a NUREG 6850,  
11 the new version of it.

12 MEMBER APOSTOLAKIS: Okay. So --

13 MR. BARRETT: We're doing that now.

14 MEMBER APOSTOLAKIS: It would be, then,  
15 possible for you to go back to that PRA and see what  
16 happens if you assume multiple --

17 MR. BARRETT: It assumed multiple in the  
18 original analysis. To use the core melt, we needed to  
19 use multiples for that particular analysis. So it  
20 included --

21 MEMBER APOSTOLAKIS: The number came out  
22 okay?

23 MR. BARRETT: It came out relatively high.  
24 I don't remember the exact number, but fire was a  
25 fairly significant contributor to risk in the --

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1 MEMBER APOSTOLAKIS: Not fire overall,  
2 but, I mean, this particular mode with --

3 MR. BARRETT: Spurious?

4 MEMBER APOSTOLAKIS: Yes.

5 MR. BARRETT: If I remember right, many of  
6 the combinations that we analyzed were within the  
7 bounds of the Appendix R analysis originally for  
8 control room evacuation. The main fire area that we  
9 got into trouble with the IPEEE or the fire PRA, the  
10 original one, was in our cable shaft going up to the  
11 control room, where we had just about every cable in  
12 the plant going through one area. And so --

13 MEMBER APOSTOLAKIS: It seems to me that  
14 --

15 CHAIRMAN WALLIS: Did you assume multiple  
16 spurious actuations, simultaneous, and all of this?

17 MR. BARRETT: In that particular PRA, we  
18 ended up having to go to multiple spurious actuations  
19 in order to get the core damage.

20 CHAIRMAN WALLIS: Okay. Including  
21 simultaneous actuations.

22 MEMBER APOSTOLAKIS: So it would be  
23 interesting, then, to compare your numbers and  
24 analysis with the bounding analysis that the NRC staff  
25 has done to see which one makes sense.

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1 I mean, it seems that we do have a body of  
2 knowledge there that at least I as a member of this  
3 Committee don't seem to have access to. I don't know  
4 whether the rest of the members are familiar with it,  
5 but I doubt it.

6 So, I mean, it would be nice to see that,  
7 especially since you have done it already, I mean.

8 MR. BARRETT: Yes. The original analysis  
9 was nowhere the rigor that 6850 requires now.

10 MEMBER APOSTOLAKIS: I understand that.  
11 I mean, you --

12 MEMBER SIEBER: It is just one plant. So  
13 it's not clear to me how you can extend that to some  
14 --

15 MEMBER APOSTOLAKIS: Yes. But it provides  
16 a basis for judging what Ray Gallucci did.

17 MEMBER SIEBER: It gives you an idea.

18 MEMBER APOSTOLAKIS: Yes. And also what  
19 kind of effort it takes to do it because under NFPA  
20 805, it seems to me that if you find -- as I recall.  
21 Maybe I'm wrong. As I recall, you're right. You're  
22 supposed to meet the regulations, but if you don't  
23 meet some of them, then you can argue in risk space.

24 MR. BARRETT: Right.

25 MEMBER APOSTOLAKIS: Right?

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1 MR. BARRETT: Right.

2 MEMBER SIEBER: You don't need to.

3 MEMBER APOSTOLAKIS: But you don't need to  
4 go back and comply. So, I mean, there is a way out of  
5 it depending on the quality of the risk assessment.

6 MEMBER SIEBER: That would be a basis for  
7 an exemption, but you can't just sit there and do  
8 nothing.

9 MEMBER APOSTOLAKIS: But is that  
10 consistent with a statement that it does a lot of  
11 work, paperwork? I mean, if you already have the PRA,  
12 why does it add a lot of work? But you just said  
13 that, right?

14 I'm sorry. I don't remember your name.

15 MR. BARRETT: Harry.

16 MEMBER SIEBER: The PRA is not  
17 state-of-the-art.

18 MR. BARRETT: Right. The original PRA is  
19 not state-of-the-art.

20 MEMBER SIEBER: They have to do the work.

21 MR. BARRETT: The one that they are doing  
22 now is state-of-the-art. They're using 6850 and --

23 MEMBER APOSTOLAKIS: When do you expect it  
24 to be completed?

25 MR. BARRETT: It should be complete by

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1 probably June of next year.

2 VICE CHAIRMAN SHACK: When you do your  
3 state-of-the-art PRA, you're going to consider  
4 multiple actuations, right?

5 MR. BARRETT: Yes.

6 MEMBER APOSTOLAKIS: Yes. So, I mean, is  
7 it clear to everyone? I mean --

8 MR. BARRETT: We are taking significant  
9 efforts to make sure we get our best chance at finding  
10 those multiple spurious risk --

11 VICE CHAIRMAN SHACK: But it seems to me  
12 that anybody doing a fire PRA is going to have to  
13 consider multiple --

14 MEMBER DENNING: Do they have to consider  
15 them as comprehensively as here? Because they will  
16 have screening criteria. And I guess can you tell me  
17 if you weren't -- you know, suppose you were not  
18 heading towards that.

19 If you are sitting there and you had to do  
20 this analysis, how long would it take you to do this  
21 analysis? And how difficult would it be to -- would  
22 you have to modify the plant to be able to accommodate  
23 it?

24 MR. BARRETT: I am not sure about that.  
25 What we would probably end up doing is using the

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1 guidance in NEI-0001, chapter 4, which is the risk  
2 analysis piece of that, which is, in essence, doing a  
3 mini PRA for the --

4 MEMBER DENNING: But you're not allowed to  
5 use that. I mean, by this generic letter, you're only  
6 allowed to do that if you're then going to look for  
7 exemptions.

8 MR. BARRETT: Right, yes. You're not  
9 doing 805. That's your only other --

10 MEMBER DENNING: Yes.

11 MR. BARRETT: I mean, you need to modify  
12 the plant or you --

13 MEMBER DENNING: Modify the plant. How  
14 long would it take you to do that analysis in --

15 MR. BARRETT: Guessing, I would say  
16 probably a year.

17 MEMBER DENNING: Probably a year. I mean,  
18 what is in here says 90 days.

19 MR. BARRETT: No way.

20 MEMBER DENNING: There's no way?

21 MR. BARRETT: No way.

22 MEMBER DENNING: You would think that --

23 MEMBER SIEBER: Well, you can tell in 90  
24 days roughly how long you think it's going to take you  
25 to do it.

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1 MEMBER DENNING: Absolutely.

2 MEMBER SIEBER: But that's not what  
3 they're asking.

4 MEMBER DENNING: But that's not what  
5 they're asking.

6 MR. BARRETT: I mean, your choices are to  
7 take your safe shutdown analysis and just say that  
8 everything in a given fire areas fails immediately.

9 MEMBER SIEBER: That is the way you used  
10 to do it.

11 MR. BARRETT: And you can't do it.

12 MEMBER SIEBER: No.

13 MR. BARRETT: I mean, with the acceptance  
14 criteria you have in Appendix R, having water level go  
15 out of the pressurizer, you can do that with just a  
16 couple of spurious actuations. If you do all of them,  
17 you're never going to make it. So I don't know how  
18 you do that in 90 days.

19 MR. WOLFGANG: This is Bob Wolfgang with  
20 again --

21 MEMBER DENNING: Go ahead, Bob.

22 MR. WOLFGANG: The 90 days, what we have  
23 currently in the generic letter is for functionality  
24 assessment. To submit any exemption requests,  
25 amendment requests, that's the six-month period.

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1 MEMBER DENNING: Yes, but what I am  
2 missing is to do the functionality assessment, don't  
3 you have to do basically the analysis?

4 MR. BARRETT: Yes. That is essentially an  
5 operability assessment. Are components operable? In  
6 order to know that, you have to do the analysis to  
7 know what gets damaged and when. There's no way  
8 you're going to do that in a short time, no way.

9 MEMBER DENNING: Dave, did you want to  
10 make some comments?

11 MEMBER SIEBER: Before we switch, one  
12 thing that you said that I think is important is you  
13 really can't get the core damage unless you have  
14 multiple spurious actuations.

15 MR. BARRETT: We have some singles that  
16 get us in trouble, and we're going to have to fix  
17 those. But as far as getting into the core damage,  
18 I'm not even sure --

19 MEMBER SIEBER: This would be opposing  
20 trains, too, right?

21 MR. BARRETT: Well --

22 MEMBER SIEBER: Train A, train B pairs.

23 MR. BARRETT: By the fire PRA methodology,  
24 you're really not even worrying about 3G2 or 3G3  
25 anymore. You're looking at fires anywhere and damage

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1 to all of the circuits.

2 MEMBER SIEBER: Right.

3 MR. BARRETT: So you're really looking at  
4 controlling fires and cable room fires and all of  
5 that. And, you know --

6 MEMBER SIEBER: But if you were to make  
7 the assumption that you only have one spurious  
8 actuation, you wouldn't get the core damage. And you  
9 could just say, "I don't need to do anything," right?

10 MEMBER APOSTOLAKIS: Well, it depends on  
11 what else fails.

12 MR. BARRETT: Yes. I think it depends  
13 largely on --

14 MEMBER SIEBER: It would be an on-fire --

15 MR. BARRETT: -- what other failures --

16 MEMBER SIEBER: -- a non-fire-induced  
17 failure, right?

18 MEMBER DENNING: There has to be a core  
19 damage frequency, though. I mean, when you said you  
20 wouldn't get core damage frequency with a single  
21 failure, you have to because you have other unrelated,  
22 but it's just very low.

23 MR. BARRETT: Also we are talking hot  
24 shorts here, but you also have fire-related damage,  
25 which takes the component out of service, which is not

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1 included in that spurious operation probability.

2 So it's a much more complicated things to  
3 get your arms around as far as loss of all electrical  
4 power, loss of indication, and all of that. It's more  
5 than that.

6 MEMBER DENNING: Yes?

7 MEMBER SIEBER: Thanks.

8 MEMBER DENNING: Dave?

9 MR. WOLFGANG: Excuse me.

10 MEMBER DENNING: Yes?

11 MR. WOLFGANG: This is Bob Wolfgang again.

12 So Duke's response to this generic letter  
13 would be we're addressing it. We're transition to  
14 NFPA 805. And we're going to address multiple  
15 spurious actuations in that transition.

16 MR. BARRETT: Yes, sir.

17 MR. WOLFGANG: And that is the total  
18 response we're looking for from --

19 MR. BARRETT: We will give you a schedule  
20 of when we think that will be done, yes.

21 MEMBER DENNING: Okay. If that is what  
22 you are asking for, you're going to have to change the  
23 generic letter.

24 MR. BARRETT: No.

25 MEMBER DENNING: My interpretation. Well,

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1 we'll look at that.

2 Dave, why don't you go ahead and say a few  
3 words?

4 MR. MISKIEWICZ: Okay. My name is Dave  
5 Miskiewicz. I'm from Progress Energy. I'm the lead  
6 PRA supporting the transition to 805 at all of our  
7 units.

8 MEMBER APOSTOLAKIS: PRA?

9 MR. MISKIEWICZ: I'm the lead PRA engineer  
10 supporting our transition.

11 MEMBER APOSTOLAKIS: I thought you said  
12 "elite."

13 (Laughter.)

14 MR. MISKIEWICZ: That does sound good.

15 A lot of the discussion I'm hearing, my  
16 perspective is probably a little bit different than  
17 the normal compliance.

18 MEMBER APOSTOLAKIS: That's why we want  
19 it.

20 MR. MISKIEWICZ: You know, there is  
21 uncertainty. And I am used to dealing with the  
22 uncertainty as how much probability I can assign to  
23 something, can I take credit for these actions and all  
24 the various things on there.

25 One of the things that strikes me is when

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1 I look at the bounding analysis and it seems like  
2 we're trying to get the best of both worlds. We want  
3 to address everything in totality and also assure that  
4 we don't have that risk.

5 You know, when I deal with traditional  
6 design basis, we are allowed one single failure. And  
7 we assume no off-site power. And we give an  
8 initiating event that happens, and that is a given.

9 PRA, we will look at multiple failures.  
10 And we may find things that are more vulnerable that  
11 weren't even addressed under compliance. And I see  
12 kind of a similar thing here except for instead of  
13 saying, "Address a single failure," we're looking at  
14 "You've got to find them all."

15 And that just seems like an impossible  
16 task. Even in the PRA world, we can model a lot of  
17 stuff, but we're still not going to get them all. But  
18 we try to find the significant things. We're trying  
19 to gear down to get the significant issues.

20 As far as the workload goes that I see on  
21 the generic letter, I think it would be significant.  
22 I'm not the circuit analysis person but when I start  
23 throwing in non-currently credited equipment into that  
24 list that I want circuits routed for and cables routed  
25 for, it is a big workload for the electrical guys who

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1 are going to be doing that work. And I would see that  
2 as a resource drain on the overall transition effort  
3 for me.

4 In fact, if I saw them, you know, all of  
5 a sudden, focusing on one area and not another area,  
6 I'm not even sure how they would be able to get all of  
7 them without doing the PRA perspective.

8 MEMBER APOSTOLAKIS: I am a little bit --  
9 I don't know what the right word is, but we keep  
10 talking about the workload. It seems to me we should  
11 be talking about the real issue.

12 Is there a real issue here? Is there a  
13 contributor to risk that we have not handled in the  
14 past or managed well? I mean, the workload I'm sure  
15 you will agree, too, it's a major contributor to risk.  
16 We have to do something about it.

17 MR. MISKIEWICZ: I agree.

18 MEMBER APOSTOLAKIS: And, you know, the  
19 thing that made me happy with Duke is that they are  
20 doing the PRA. They will consider the multiple hot  
21 shorts or spurious situations. Is your company doing  
22 something similar or --

23 MR. MISKIEWICZ: We are doing the PRA.  
24 And we're going to in the PRA model the hot shorts,  
25 the spurious actuations.

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1 MEMBER APOSTOLAKIS: According to the  
2 latest information we have and everything?

3 MR. MISKIEWICZ: When we say important,  
4 too, it's almost, you know --

5 MEMBER APOSTOLAKIS: You're not going to  
6 use .1? You're going to use .6, for example?

7 MR. MISKIEWICZ: We'll use whatever the  
8 methodology recommends.

9 MEMBER BONACA: You can go to Professor  
10 Apostolakis if you remember.

11 MEMBER APOSTOLAKIS: Give me a call. I'll  
12 tell you.

13 (Laughter.)

14 MR. MISKIEWICZ: It's .1. And we're  
15 working through those issues, but even doing that is  
16 going to be limited somewhat. You know, there are  
17 screening techniques and things used that we're going  
18 to work our way through as to which circuits really  
19 need to be evaluated.

20 MEMBER DENNING: Do you think the approach  
21 is clearly defined as to how you come up with a  
22 probability for these actuations?

23 MR. MISKIEWICZ: Right.

24 MEMBER DENNING: There is some randomness  
25 that one assumes in terms of which circuits can

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1 connect with which other circuits to --

2 MR. MISKIEWICZ: I think what we know now  
3 is better than what we knew ten years ago when we were  
4 dealing with this.

5 MEMBER DENNING: Yes. But it isn't  
6 obvious to me even what the best approach is to doing  
7 that within the fire PRA, let alone deterministically.

8 MEMBER APOSTOLAKIS: So the position,  
9 then, of at least you two gentlemen and maybe the  
10 industry is that this generic letter is unnecessary,  
11 that you are handling the issue of multiple spurious  
12 actuations via the PRA and as you transition to it --  
13 are you transitioning to 805?

14 MR. MISKIEWICZ: Yes, we are.

15 MEMBER APOSTOLAKIS: As you transition to  
16 805, you may have to come back to the NRC and, using  
17 risk arguments, request an exemption of some sort. Is  
18 that your position?

19 MEMBER BONACA: Well, I heard it  
20 differently.

21 MEMBER APOSTOLAKIS: What?

22 MEMBER BONACA: I heard it differently.  
23 I heard simply that the burden should be on the NRC to  
24 perform. Okay.

25 MEMBER APOSTOLAKIS: But they are handling

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1 it already.

2 MEMBER BONACA: Yes.

3 MR. BARRETT: We are handling multiple  
4 spurious in the PRA as part of the 805 transition.

5 MEMBER APOSTOLAKIS: And then what?

6 MR. BARRETT: And then we're going to  
7 follow the industry guidance and the regulatory  
8 guidance provided by the NRC. And depending upon  
9 where the thresholds fall in relation to the  
10 self-approval thresholds, if it's less than the  
11 self-approval threshold, then we'll end up  
12 self-approving an exemption in accordance with the NRC  
13 rules for 805 implementation.

14 MEMBER APOSTOLAKIS: Right, right.

15 MR. BARRETT: If it's over that threshold,  
16 then we'll end up having to --

17 MEMBER APOSTOLAKIS: Come back.

18 MR. BARRETT: -- contact the staff and  
19 work out whether we have to modify or whether we can  
20 leave the situation as is.

21 MEMBER APOSTOLAKIS: The conclusion one  
22 can draw from this is that you believe that this  
23 generic letter is unnecessary because there is already  
24 a process in place. Is that correct?

25 MR. BARRETT: For 805, for their plants.

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1 Not everyone is --

2 MEMBER APOSTOLAKIS: Why wouldn't another  
3 plant apply the same thing?

4 MEMBER SIEBER: It is an optional process.  
5 Some plants --

6 MEMBER APOSTOLAKIS: Oh, they don't --

7 MEMBER SIEBER: -- may decide not to do  
8 anything at all.

9 MEMBER APOSTOLAKIS: If they don't  
10 transition to 805, you mean?

11 MEMBER SIEBER: Yes.

12 MR. MARRION: If I may, Dr. Apostolakis,  
13 there are 40 plants that have submitted letters of  
14 intent to the NRC. The resolution of this issue for  
15 the 805 plans has yet to be determined. The approach  
16 is the use of the PRA, do the modeling -- all right?  
17 -- and then define that.

18 But that would be applicable to those 40  
19 plants. The other plants, the balance of the  
20 industry, have used any combination of the single  
21 failure to three or four failures.

22 You heard mention of NEI-001 that has the  
23 methodology, both -- two methodologies: deterministic  
24 and risk-informed. We piloted that at two plants.

25 And so we can't take credit for that

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1 anymore because of this new position with the generic  
2 letter. But I suspect that the solution will be had  
3 with the pilot exercise over the next several months  
4 to a year possibly and that that's the solution that  
5 needs to be evaluated for applicability to the non-805  
6 plants because, absent that, I don't see anyone coming  
7 up with a generic solution for the non-805 plants  
8 today. And it is going to be based upon PRA.

9 MR. MISKIEWICZ: Even in 805, though, when  
10 we do a fire PRA, there will be some iterative  
11 process. You know, we're dependent on the circuit  
12 analysis people giving us the information that we need  
13 to model. And so we're going to try to get risk to  
14 make sure we're modeling the right areas.

15 MEMBER SIEBER: Just the basic methodology  
16 of PRAs causes you to consider multiple spurious --

17 MR. MISKIEWICZ: If you model all of your  
18 singles and multiples from singles --

19 MEMBER SIEBER: That's the way it is.

20 MEMBER APOSTOLAKIS: But in the old days,  
21 in the first PRAs, I don't think we considered that.

22 MR. MISKIEWICZ: You modeled your singles.  
23 And they would combine in your results to give you  
24 multiples.

25 MEMBER SIEBER: Part of the process.

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1 MR. MISKIEWICZ: Yes. But you would still  
2 have to model the spurious event was a failure mode  
3 for that specific piece of equipment, --

4 MEMBER SIEBER: Right.

5 MR. MISKIEWICZ: -- which depends on the  
6 circuit analysis people telling you where that --

7 MEMBER SIEBER: So the philosophical  
8 discussion as to what the assumptions ought to be is  
9 sort of moot because the process of the PRA itself  
10 takes care of that if it's done thoroughly and done  
11 right.

12 MEMBER APOSTOLAKIS: One of the things  
13 that we don't do at this Committee is have  
14 presentations or briefings on the actual analysis that  
15 the industry is doing.

16 MEMBER SIEBER: Right.

17 MEMBER APOSTOLAKIS: I think that would be  
18 extremely beneficial to us if somehow we found a way  
19 to have the industry come and present a detailed PRA,  
20 fire PRA in this case. Anyway, that's a separate  
21 issue.

22 MEMBER DENNING: I think what we would  
23 like to do at this point is thank you gentlemen. And  
24 we may still ask you in the few minutes that we have  
25 left if we have some additional questions. We have

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1 the potential to hear about additional experimental  
2 work that could potentially change some perspectives,  
3 but I don't think we'll do that.

4 I think what we ought to do now is we  
5 would have some discussion while we still have the  
6 staff here and the industry here, we have some  
7 discussion? Would you agree, Graham, that we'll have  
8 some discussion here, see just kind of where we are  
9 sitting on this?

10 CHAIRMAN WALLIS: I was thinking about  
11 that. I think we certainly need discussion.

12 MEMBER SIEBER: Yes.

13 CHAIRMAN WALLIS: I think some of it needs  
14 to be in our working session, --

15 MEMBER DENNING: Yes.

16 CHAIRMAN WALLIS: -- rather than open  
17 session, but I think we can do some of it now. What  
18 little bit we can do now to clarify the situation  
19 certainly we should do now.

20 MEMBER ARMIJO: I have a question that may  
21 not be a discussion. Just in reading the staff's  
22 response to a lot of the comments received on the  
23 draft, there was reference to a lot of -- where is  
24 this thing, the screening tool, a risk screening tool,  
25 that the licensees develop a risk screening tool to be

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1 reviewed and approved by the staff.

2 This is a tool that would evaluate a  
3 variety of different multiple spurious actuations and  
4 sort them out and say, "These are the ones to worry  
5 about. And the rest we don't have to worry about."

6 What is your view? Does such a tool  
7 exist? Do you use such tools, both parties?

8 MR. MISKIEWICZ: We haven't kind of gotten  
9 to that step yet. I'm not exactly sure what the  
10 paragraph is you are referring to.

11 MEMBER ARMIJO: Yes. It's --

12 MR. MISKIEWICZ: But we can do  
13 sensitivities and say, "If I just fail the system, you  
14 know, a functional type of thing, if it's not  
15 significant, then I don't have to go down deeper and  
16 model all the individual spurious. I can screen it by  
17 saying it's not going to matter without doing the  
18 detailed modeling," you know.

19 MEMBER APOSTOLAKIS: The screening depends  
20 on a number of factors, this being one, but the other  
21 is the amount of fuel you have in your area, whether  
22 you can have a fire to begin with, the fire PRA.

23 MEMBER ARMIJO: I thought it was here is  
24 a large number of conductors that can cause spurious  
25 actuations of a large number of systems. And nobody

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1 has defined what scenarios are worrisome. It seems to  
2 me like it's a large number of mind-boggling barriers.  
3 And how do you sort those all?

4 MR. BARRETT: Let me address that.

5 MEMBER ARMIJO: Yes.

6 MR. BARRETT: One of the things that Duke  
7 has done -- and I think Progress is going to follow  
8 suit when they actually do their PRA -- is we have  
9 attempted to put our arms around the most significant  
10 multiples that we could think of by putting together  
11 an expert panel of people who know the plant, know the  
12 Appendix R design, no fire protection, and postulate  
13 these in an organized fashion, like going through  
14 PNIDs and plant design records to say, "All right.  
15 What are the real multiple spurious combinations that  
16 would really hurt me?" and capture those in scenarios  
17 so that they can be analyzed in detail in the fire PRA  
18 so that we can really look at the risk.

19 We're looking at it taking a three-pronged  
20 approach. We have the Appendix R analysis that says,  
21 "Here is all the safe shutdown stuff that I've got to  
22 have. Here are the cables and where they go in the  
23 plant. And then here is what gets damaged in each  
24 fire area."

25 And we take the expert panel. And we say,

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1 "Well, is there anything we missed? You know, is  
2 there something out there that because you end up  
3 flushing the toilet over here and you end up turning  
4 that light bulb on, the combination of things gets you  
5 something you didn't expect?" The expert panel is  
6 supposed to deal with that.

7 And then we also look at the PRA and true  
8 up all AOVs, true up all MOVs, and see if those kinds  
9 of things give us surprises that we didn't expect.  
10 Between the three of those, we think we're going to  
11 end up probably having 95 percent of the  
12 risk-significant scenarios.

13 MEMBER DENNING: For all of your plants,  
14 do you know where your cables are by tray?

15 MR. BARRETT: We didn't. We ended up  
16 having to pay to have that analysis done for us. I  
17 think it was originally determined in the '80s but was  
18 not captured in a database or anything. And we had to  
19 go back and --

20 MEMBER DENNING: But you had that for all  
21 your plants, do you?

22 MR. MISKIEWICZ: I wouldn't say all of the  
23 plants. That's a lot of work. In a lot of cases it's  
24 limited to the set of equipment that met the rule for  
25 the Appendix R compliance --

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1 MEMBER DENNING: It seems to say that --

2 MR. MISKIEWICZ: -- or our equipment that  
3 we want to credit from PRA perspective because there  
4 is risk-significant equipment in mitigation that is  
5 not within the scope of Appendix R right now. And  
6 that we'll add to the list. And some of those still  
7 need to be routed.

8 MEMBER DENNING: You do have additional  
9 cable routing that you would have to determine;  
10 whereas, you feel that you have already done the --

11 MR. BARRETT: There were some things in  
12 the PRA that we had not addressed in safe shutdown,  
13 and we're going to have to have --

14 MEMBER DENNING: Well, PRA is one thing.  
15 What about with this requirement? Does that change?  
16 Would you have to -- if this was imposed on you, do  
17 you think you have to do more cable tracing?

18 MR. BARRETT: What I'm talking about is  
19 our attempt to try to get our arms around all of the  
20 risk-significant scenarios.

21 MEMBER DENNING: Scenarios? Okay.

22 MR. BARRETT: So that's why we did the  
23 expert panel and all of that, to try to get our arms  
24 around things that we would have otherwise missed.

25 MEMBER DENNING: You keep saying

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1 "risk-significant." And we're in a space here where  
2 we're not necessarily risk-significant. It's broader  
3 than that.

4 MR. BARRETT: I think if you take all of  
5 the cables and you just fail them all and you say they  
6 all happen immediately, you're done.

7 MEMBER DENNING: You can't survive.

8 MR. BARRETT: Some of these areas you  
9 can't survive it.

10 MEMBER DENNING: Okay.

11 MEMBER SIEBER: On the other hand, from a  
12 risk standpoint, the set of cables that you have to  
13 know what the routing is becomes larger than the  
14 Appendix R set.

15 MR. BARRETT: Yes.

16 MEMBER SIEBER: But it is certainly not  
17 all of the cables. So there is going to be some  
18 physical work that has to be done if you don't have  
19 pull ticket. If you don't have the database, you  
20 can't --

21 VICE CHAIRMAN SHACK: In the NEI-001  
22 guidance, where, as I understand it, you do up to four  
23 failures, how do you select those four?

24 MR. BARRETT: A similar process with the  
25 expert panel and using Appendix R analysis, a similar

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1 process.

2 MR. FRUMKIN: This is Dan Frumkin from the  
3 staff.

4 One of the things that we have discovered  
5 about defining a failure is a lot of the analyses  
6 assume once spurious actuation, once spurious  
7 actuation, what the NEI or at least the risk, 2,403 --  
8 and I think NEI-001. They talk about multiple hot  
9 shorts.

10 Now, one pair of conductors coming  
11 together could cause numerous different spurious  
12 actuations. So I think that the staff and the --  
13 well, the staff has come out with 2,403 and has put it  
14 on the table.

15 We are looking for this hot short. That  
16 could cause whatever it could cause. We're not  
17 counting spurious actuations anymore. We're taking  
18 that hot short and saying, "Well, what could it  
19 cause?"

20 I think there was a situation where there  
21 was one cable or just a number, just a few conductors,  
22 or maybe it was even two conductors that could give an  
23 indication which could open all of 16 SRVs at one  
24 plant.

25 Now, a long time ago that might have been

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1 16 separate spurious actuations. And today we're  
2 looking at that as one pair of conductors coming  
3 together. And I think everybody is pretty much on the  
4 same page that yes, obviously if the circuits can  
5 cause all of those spurious actuations, we consider  
6 that.

7 MEMBER DENNING: Well, I guess a comment  
8 that I would have on generally what I have heard is  
9 that I think it's very clear that there are timing  
10 issues. If we go forward with the generic letter,  
11 then, at least in my interpretation of the generic  
12 letter, there are timing requirements that are not  
13 doable by the industry and that one would have to do  
14 some relaxation of that. And I don't see where just  
15 having the 30-day, where they can say, "It's going to  
16 take me longer as appropriate."

17 Now, it could be that maybe this should be  
18 more of an information-gathering generic letter,  
19 rather than one that is quite forcing the NRC's  
20 position about the need for multiple spurious  
21 actuations without a more relaxed position like NEI's.

22 I guess what I'm looking for are general  
23 comments as to people, where they are seemingly  
24 falling on this generic letter.

25 MEMBER MAYNARD: Well, I would agree with

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1 most of your comments there. First of all, I do  
2 believe that it clearly constitutes a backfit. We  
3 will get into some other things later on that, but we  
4 don't have to change regulations to be changing  
5 requirements. A change in staff position on what is  
6 acceptable for meeting a regulation, changing those  
7 position, also constitutes a backfit.

8 With that said, I would also like to say  
9 that this issue needs to be resolved. I think playing  
10 around too long about what is the right regulatory  
11 process isn't going to serve everybody's best interest  
12 either.

13 I think it is important. This issue has  
14 been around for 25 years. It needs to get resolved in  
15 an approach going forward as to what is it going to  
16 take to either make it go away as an issue or to  
17 actually fix it.

18 I think the 90 days, I think basically if  
19 it goes out the way it is, basically you're going to  
20 end up with everybody coming in with time request  
21 extensions. And so I don't think that's really the  
22 right thing to do there.

23 If it goes out the way it is, I think it  
24 needs to extend that time. I think it might be better  
25 to go out with what is truly an information request,

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1 to gather information to then be able to determine  
2 what the next steps are.

3 But, again, I don't think process should  
4 drag out for another 5 or 10 or 15, 20 years.  
5 Something needs to be done to put it on a resolution  
6 path.

7 VICE CHAIRMAN SHACK: Let me just come  
8 back to that for a second. I mean, we know what you  
9 expect from the 40 plants that are going for NFPA 805.  
10 What do you expect from the others?

11 MR. WOLFGANG: This is Bob Wolfgang again.

12 I think a number of them are going to come  
13 back and say, "We meet our licensing basis, and thank  
14 you very much. And good-bye."

15 MEMBER DENNING: Will they really say  
16 that? I mean, your --

17 MR. WOLFGANG: That is one thing.

18 VICE CHAIRMAN SHACK: Will you accept that  
19 answer?

20 MEMBER SIEBER: Send it over to  
21 enforcement.

22 MR. WOLFGANG: No. No, we won't. What we  
23 will hear from others is --

24 VICE CHAIRMAN SHACK: What would you  
25 consider an acceptable response from the others?

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1 MR. WOLFGANG: Well, "We don't address  
2 multiple spurious actuations. Here is our plan to  
3 address it to do" X, Y, Z. I don't know. "Do  
4 physical mods."

5 MEMBER DENNING: That's a six months'  
6 answer.

7 MR. WOLFGANG: Yes. That will be the  
8 six-month answer. But initially, yes, either you meet  
9 it or you don't meet it. We don't think we meet it.  
10 We think we meet it.

11 For the first round, that's all I think  
12 we're going to get.

13 MEMBER DENNING: Getting back to this  
14 backfit question, I'm not sure that ACRS is the  
15 appropriate one to answer that. Obviously it makes it  
16 easier for the regulatory staff if it's not a backfit  
17 question.

18 MEMBER BONACA: Yes. One thing that  
19 troubles me a little bit is, you know, is it a  
20 significant issue or is it not a significant issue?  
21 That's a plant-specific answer. And so we're not  
22 going to find out an answer to the question.

23 And I think that if we had to perform a  
24 generic evaluation to justify a backfit, I'm not sure  
25 that it could be done because, I mean, it's so

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1 specific to the plant, the age, to whatever the  
2 situation may be.

3 MEMBER DENNING: But this question of a  
4 specific issue, I think you can do a reduced analysis  
5 to determine. I think you can screen out stuff a  
6 priori --

7 MEMBER BONACA: I think so, too.

8 MEMBER DENNING: -- you know, so that it  
9 isn't such an onerous job to determine what's  
10 important and what's a potentially significant risk  
11 contributor here.

12 MEMBER BONACA: Clearly, I mean, something  
13 has to be done. I mean, we have new evidence in front  
14 of us. And I completely agree with you, Otto, that it  
15 can't wait. They have to be dealt with.

16 I think that, however, the industry needs  
17 more time to deal with this. They don't have a  
18 ready-made process by which they can screen this out  
19 and address it. So the issue is more the time.

20 Now, the next statement again, as reported  
21 to you, is the fact that we are not really the best  
22 charges of what is the most appropriate regulatory  
23 process to follow to go ahead with this.

24 MEMBER APOSTOLAKIS: Our job here is to  
25 judge the generic letter as presented to us.

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1 MEMBER BONACA: Yes.

2 CHAIRMAN WALLIS: I am just wondering how  
3 we add value to this. If we were a subcommittee, we  
4 might well say, "Look, we now know what the issues  
5 are. We think there must be a better way than having  
6 the agency send out this generic letter asking for  
7 things which may be impractical for some plants," but,  
8 then, there should be some way to work with the plants  
9 to figure out what is the right solution to this  
10 technical problem. I'm not sure.

11 We're also sort of a facilitator between  
12 industry and the agency, and that's not really our  
13 job, though, is it?

14 MEMBER SIEBER: Well, the other thing that  
15 is not our job is to try to figure out whether it's a  
16 backfit or not. That's a legal question.

17 CHAIRMAN WALLIS: Well, we don't even know  
18 how important it is because we don't have these proper  
19 risk analyses.

20 MEMBER DENNING: Well, having resolved  
21 these questions, I now turn it back to you, Mr.  
22 Chairman.

23 (Laughter.)

24 CHAIRMAN WALLIS: I can make a very  
25 decision, which is to take a break for lunch. We are

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1 going to be ethics-trained at 12:15. And then we go  
2 to work again at 1:30. Thank you very much for your  
3 presentations.

4 We'll take a break, and as a Committee,  
5 we're going to be back here, not on the transcripts or  
6 anything, for ethics training at 12:15. We'll start  
7 the official proceedings again at 1:30.

8 (Whereupon, a luncheon recess was taken  
9 at 11:33 a.m.)

A-F-T-E-R-N-O-O-N S-E-S-S-I-O-N

(1:33 p.m.)

CHAIRMAN WALLIS: Back into session. The next item on the agenda is another generic letter; first of all, underground cable failures that disable accident mitigation systems.

Our cognizant member is Mario Bonaca. I will hand over the meeting to him. Please go ahead, Mario.

MEMBER BONACA: Thank you, Mr. Chairman.

3) DRAFT FINAL GENERIC LETTER 2006-XX,

"INACCESSIBLE OR UNDERGROUND CABLE FAILURES THAT  
DISABLE ACCIDENT MITIGATION SYSTEMS"

3.1) REMARKS BY THE SUBCOMMITTEE CHAIRMAN

MEMBER BONACA: We have a presentation from the staff. They are proposing to issue a generic letter on inaccessible underground cable failures that disable accident mitigation systems.

We have recently become conversant with this issue through license renewal. You may remember that the GALL report requires for license renewal the existence of two programs: one, a program to detect the presence of water and the watering actions; and the other one is a program to test the cables and essentially-- so we are aware of the concern here.

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1 And the staff is now addressing this issue in the  
2 current licensing area.

3 And so, with that, I will turn to the  
4 staff. Mr. Mayfield?

5 3.2) BRIEFING BY AND DISCUSSIONS WITH  
6 REPRESENTATIVES OF THE NRC STAFF

7 MR. MAYFIELD: Good afternoon. I'm Mike  
8 Mayfield, the Director of the Division of Engineering.  
9 And my division is sponsoring this generic letter.

10 We're here this afternoon to seek ACRS  
11 endorsement to publish the generic letter. The  
12 generic letter, as Mr. Koshy will describe, provides  
13 some information to licensees on the significance of  
14 these potential failures, and seeks some information  
15 from licensees regarding the monitoring of these  
16 cables.

17 Tom Koshy from the Electrical Engineering  
18 Branch will make the presentation.

19 MR. KOSHY: Thank you, Mike.

20 As Dr. Bonaca mentioned to you, this was  
21 first brought to your attention as a problem during  
22 the license renewal hearing at the ACRS. The question  
23 was, is dewatering every ten years going to prevent  
24 the problem?

25 At that time, in light of the failures

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1 that we had noticed at the time, we thought of taking  
2 it as an operating reactor issue under Part 50. And  
3 we did some serious looking into see how big the  
4 problems are.

5 The safety concerns identified at the time  
6 were some of these underground and inaccessible cables  
7 supply power to some safety-related components. Using  
8 some examples here, the off-site power, the cable that  
9 brings the off-site power, to the safety buses.

10 The second would be the emergency diesel  
11 generator feeder. This is critical in those cases  
12 where the emergency diesel generator to building is  
13 physical apart from the main building so that the  
14 underground cables bring into power; and then the  
15 emergency service water pumps, these cases where the  
16 pump house is located again, you know, physically away  
17 from the plant so that the power supply to the service  
18 water pump has to go through underground cables.

19 And failure of one of these cables could  
20 affect multiple systems in these sense there could be  
21 a train, cooling off of safety systems, collectively  
22 influencing more than just one isolated system.

23 Most of these failures that we came across  
24 did not have any direct reference to having a  
25 qualification for this cable to withstand the moisture

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1 environment or, essentially, you know, in duct banks,  
2 if it is immersed in water, you know, can it  
3 withstand. That type of qualification had not been in  
4 existence for these cables that we came across.

5 MEMBER BONACA: Let me understand now,  
6 however. These are cables in safety-related  
7 applications?

8 MR. KOSHY: Yes.

9 MEMBER BONACA: Okay. So evidently on day  
10 one, when the plant was built, there was no  
11 expectation that the cable would be wetted?

12 MR. KOSHY: Yes. In fact, they thought it  
13 would stay relatively dry, but as duct banks develop  
14 cracks, you know, there would be traffic about it.  
15 And eventually these things crack. And depending on  
16 the water table, you know, it could be immersed for a  
17 long time or maybe a short time.

18 MEMBER BONACA: Well, in many cases, these  
19 cables are buried --

20 MR. KOSHY: Yes.

21 MEMBER BONACA: -- in the ground. So from  
22 day one, there was an expectation that they would see  
23 humidity and why we are not environmentally qualified.

24 MR. KOSHY: Either it was not specified at  
25 the time or they thought that, you know, the existing

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1 material at the time could withstand some level of  
2 moisture. For some reason, they did not specifically  
3 seek out.

4 The reason I stated that is, you know,  
5 much in the later period, now we have cables that can  
6 withstand such highly moist environment. In fact, I  
7 know of a case where they have run the cable to the  
8 river. That's for a --

9 CHAIRMAN WALLIS: But not forever.

10 MR. KOSHY: Excuse me?

11 CHAIRMAN WALLIS: Just because they are  
12 qualified doesn't mean they will survive forever in  
13 this environment.

14 MR. KOSHY: You are right, yes. Yes.  
15 They may not survive forever, but at least, you know,  
16 they have some demonstrated capability for a certain  
17 period that it can be even immersed in water and still  
18 do its function.

19 But all of that addresses, you know, the  
20 possibility that you need to know the condition of the  
21 insulation so that you have that confidence that it  
22 can do its function for the foreseeable future.

23 We went back into the history of the LERs  
24 that we have on record. We saw failure at 17 sites  
25 and cable replacements at 100 or so. And most of the

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1 faulty cables were not discovered until there was an  
2 operational failure.

3 Again, these are based on LERs, where the  
4 system has a redundant system or some reason, because  
5 of a plant trip or the failure was serious enough it  
6 prompted an LER.

7 MEMBER ARMIJO: What is your definition of  
8 a medium cable?

9 MR. KOSHY: 5 kV.

10 MEMBER ARMIJO: And above?

11 MR. KOSHY: 5 kV. Well, in the sense of  
12 when you go into 13 kV, you know, some people label it  
13 as medium also.

14 MEMBER ARMIJO: Okay.

15 CHAIRMAN WALLIS: High tension.

16 MEMBER SIEBER: Four-eighty volts to --

17 MR. KOSHY: Four-eighty will be below  
18 that. Yes. We will not call that medium, yes.

19 MEMBER SIEBER: Four-eighty is --

20 MEMBER BONACA: But you include those?

21 MR. KOSHY: Excuse me?

22 MEMBER BONACA: But you include those in  
23 the --

24 MR. KOSHY: Yes, we are including those  
25 because there are certain plants where the emergency

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1 diesel generator generates voltage at 480 and  
2 emergency service water and safety pumps are at 480  
3 volts, some small plants and early vintage.

4 MEMBER BONACA: Okay.

5 MR. KOSHY: So we wanted to include that  
6 also. That's why we went more than just medium  
7 voltage.

8 The EPRI data indicated about 65 cable  
9 failures. And later the white paper which NEI has  
10 submitted indicated about 55 failures for about 15  
11 plants.

12 Most of the cable failures have what in  
13 common? It's about 12 years of age. And the cable  
14 was subjected to some type of, you know, moisture  
15 environment, probably for a longer duration or a  
16 shorter duration. And these things were essentially  
17 common factors.

18 The cables, again, that we are focusing on  
19 is about roughly about six to eight cables, you know,  
20 depending on the design uniqueness, the cables that  
21 can have the most, let's say, significant impact on  
22 the plant.

23 MEMBER MAYNARD: The cable was about 12  
24 years old? You're saying that all of these failures  
25 were about the same age or --

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1 MR. KOSHY: No. More than that. There  
2 are some 20-plus.

3 MEMBER MAYNARD: Okay. All right.

4 MR. KOSHY: Yes.

5 CHAIRMAN WALLIS: It was at least 12 years  
6 old. At least 12 years. I was trying to figure it  
7 out. If it's every 12 years, that's pretty severe.

8 MR. KOSHY: You're right. Twelve and  
9 above. So in this generic letter, what we are  
10 focusing on is power cables that are within the scope  
11 of the maintenance rule, including cables connected to  
12 off-site power, emergency service water, and the other  
13 examples that I stated before, and those routed  
14 through underground or inaccessible locations, such as  
15 buried conduits, cable troughs, above-ground and  
16 underground. And these are the things that we are  
17 considering to be within the scope of this generic  
18 letter.

19 The benefits of this program are gaining  
20 confidence in the capability of the cable to respond  
21 to design bases events. To give you an example, at  
22 Turkey Point after the hurricane, the diesel had to  
23 run for about a week continuously. And thereafter for  
24 a month's period, the diesel had to come back on for  
25 other spurious power outages.

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1           So if you are looking into an accident  
2 where it has to be on a LOOP condition where these  
3 cables may need to be relied on for a few weeks. So  
4 we are not looking at a few hours of operation. The  
5 confidence needs to be gained for a period much higher  
6 than a few hours, which is usually the subject of our  
7 maintenance and surveillance activities.

8           MEMBER BONACA: Do you have examples of  
9 failures in service that were not exhibited during  
10 functional testing?

11           MR. KOSHY: What we have, the reported  
12 failures are a combination of both. Some in-service  
13 failures certain plants appear to have more than  
14 others. And others, when you start for surveillance,  
15 you find out that, you know, after a couple of hours,  
16 it fails.

17           So the LERs that we recorded are those  
18 cases where the plant impact was significant, so in  
19 the sense either operational. And if it is purely  
20 during a surveillance, we will not get an LER report  
21 on it.

22           So that's some of the problem that we are  
23 facing. The LERs that we received are so limited in  
24 number because, you know, it had to either bring a  
25 plant down or give an easy access situation for us to

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1 plant an LER report.

2 So that's why we are focusing on getting  
3 a handle on the extent of failures so we can engage  
4 them and see what other actions would be necessary.

5 CHAIRMAN WALLIS: Could you explain  
6 something to me?

7 MR. KOSHY: Yes.

8 CHAIRMAN WALLIS: I can understand  
9 off-site power sort of coming in on the underground  
10 cable. Why is diesel generator? Why does the diesel  
11 generator have underground cables? Is it part of the  
12 plant?

13 MR. KOSHY: Yes. For example, in some  
14 plants, the building is a separate building.

15 CHAIRMAN WALLIS: It's in a separate  
16 building. It's in a separate building.

17 MR. KOSHY: Yes. For example --

18 CHAIRMAN WALLIS: Okay.

19 MR. KOSHY: -- they have separate  
20 building.

21 CHAIRMAN WALLIS: They might be in a  
22 separate building?

23 MR. KOSHY: Yes.

24 CHAIRMAN WALLIS: That's very different  
25 from, say, something that comes from off-site power,

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1 where the cable may be a long cable from --

2 MR. KOSHY: Yes. That will be  
3 significantly longer. That will be from the  
4 switchyard. In some cases, you will have a situation  
5 closer to the plant, where you bring down to 13 kVR or  
6 so.

7 CHAIRMAN WALLIS: Okay. Thank you.

8 MR. KOSHY: The next benefit is we can  
9 prevent the unanticipated failures that cause plant  
10 transients by using the maintenance rule as the scope.  
11 We are also looking at challenges to the plant in the  
12 sense of what will give you a plant transient. So  
13 that is what is seen as the scope of this generic  
14 letter.

15 The next is you can use a convenient  
16 outage if you know the rate of degradation. Rather  
17 than taking, you know, unwarranted outages, you can  
18 schedule that cable replacement for a convenient  
19 refueling outage and do the replacement with minimum  
20 interruption.

21 CHAIRMAN WALLIS: Are these cables usually  
22 designed so they can easily be pulled through to  
23 repair them?

24 MR. KOSHY: No. It is very  
25 time-consuming, most of the --

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1 CHAIRMAN WALLIS: There's not a big duct  
2 in the cable and you just drag through a new cable?

3 MR. KOSHY: No.

4 CHAIRMAN WALLIS: No? You have to take it  
5 out? You have to dig it up?

6 MEMBER SIEBER: It's the whole thing. No.

7 MR. KOSHY: Well, pull-through is there,  
8 but the thing is it has a lot of staging. And you  
9 have energized equipment on both sides. So you need  
10 to essentially take some bus outages. So it is  
11 significantly time-consuming.

12 CHAIRMAN WALLIS: Yes, but you don't have  
13 to dig it out?

14 MR. KOSHY: Unless it is direct buried  
15 cable.

16 MEMBER BONACA: In fact, I mean, for  
17 example, yesterday during the review of Monticello,  
18 the majority of their underground cable, they're  
19 buried.

20 CHAIRMAN WALLIS: Those are usually  
21 utility duct or something, in other words.

22 VICE CHAIRMAN SHACK: This is direct  
23 buried.

24 CHAIRMAN WALLIS: Direct buried cable?

25 MR. KOSHY: Those are not exceptions.

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1 Usually you will have a duct bank with some sleeves in  
2 there so that you can pull through it.

3 MEMBER BONACA: And it depends on the age  
4 of the plant. I mean, Monticello is an older plant.  
5 They buried it, and that was it.

6 MR. KOSHY: So you have a wide variety on  
7 those?

8 MR. MORRIS: Tom, George Morris, EEEB.  
9 Some of the original cables that were pulled through  
10 duct bank, all of the original cables that were pulled  
11 through duct bank, were pulled through with the use of  
12 cable lubricant to reduce the friction. After they  
13 had been in there for a while, that lubricant has  
14 dried up.

15 MEMBER BONACA: It doesn't work.

16 MR. MORRIS: In some cases, it's almost  
17 like concrete.

18 MR. KOSHY: Okay. Moving on to some  
19 examples, Ocone is a success story where they found  
20 that two of the six cables had significant  
21 degradation. And they were able to monitor it and  
22 take the outage at a convenient time so that they can  
23 replace them.

24 Another example I am using here is Peach  
25 Bottom. When they experienced a failure, they decided

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1 to make a global replacement. You know, they didn't  
2 want to do any testing at all. And that's also a  
3 solution.

4 CHAIRMAN WALLIS: Now, is it always water  
5 that leads to degraded cables? It seems to me that  
6 you could have a cable and a duct which might just --  
7 you know, the insulation can over a period of time  
8 oxide or whatever it does. I mean, even in your house  
9 without water, you get cables that --

10 MR. KOSHY: Yes.

11 CHAIRMAN WALLIS: The insulation cracks  
12 and so on.

13 MR. KOSHY: This has some influence in the  
14 sense if it is a dry insulation and there is only  
15 cracks, chances are it will survive a little longer.

16 CHAIRMAN WALLIS: That's right, but it may  
17 --

18 MR. KOSHY: The presence of chemicals --

19 CHAIRMAN WALLIS: Makes it work.

20 MR. KOSHY: -- create default.

21 CHAIRMAN WALLIS: It's not essential that  
22 you have moisture, is it?

23 MR. KOSHY: Right. You're right. We are  
24 not trying to look at the root cause of what causes  
25 the failure. We are more interested in seeing,

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1       irrespective of the causes, let's have a program in  
2       place so that we can prevent such unanticipated  
3       failures and have a great confidence in the accident  
4       mitigation capability. So that's the focus we are  
5       trying to get because for --

6                   CHAIRMAN WALLIS: There is no routine  
7       measurement of, say, resistance of ground of a cable?  
8       There is no routine --

9                   MR. KOSHY: There is some technology  
10      developing that way, but online systems have not been  
11      doing that well. I think the industry is headed that  
12      way and there is some aggressive effort in the  
13      industry for coming up with something like that or,  
14      rather, building confidence in the systems that are  
15      now under development.

16                   Oyster Creek is an example where they  
17      replaced the cables and they had few repeated  
18      failures. This design is also unique. They  
19      essentially had this cable going about 200 feet away  
20      from the main plant as an extension of the safety bus.  
21      And this is remaining energized all the time. And  
22      that earlier had several failures.

23                   So the information that we are requesting  
24      is provide to us a history of the cable failures in  
25      the scope that I discussed just before and a

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1 description and frequency of the inspection, testing,  
2 and the monitoring programs in place. And if you do  
3 not have a monitoring program in place, explain to us  
4 why such a program is not necessary. So that is  
5 essentially what we are asking in --

6 CHAIRMAN WALLIS: So this is really  
7 information gathering. This isn't requiring an  
8 action?

9 MR. KOSHY: Right, right.

10 VICE CHAIRMAN SHACK: Now, are you  
11 distinguishing between a monitoring program and a  
12 functional testing program here?

13 MR. KOSHY: Okay. The explanation that we  
14 have given, in fact, I am addressing as a response to  
15 a public comment, what we are saying is the functional  
16 testing that you do that you energize for a short  
17 period doesn't give you any confidence that it will do  
18 it again.

19 VICE CHAIRMAN SHACK: Okay. So you're not  
20 counting that as a monitoring program?

21 MR. KOSHY: Yes. We are not.

22 MEMBER SIEBER: A surveillance test.

23 MR. KOSHY: These are the organizations  
24 that have given response to the first version that  
25 went out for public comments. And I will address the

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1 highlights of how we addressed those comments.

2 Cable failures are random. And,  
3 therefore, no NRC action is required.

4 CHAIRMAN WALLIS: It sounds like saying  
5 they're an act of God or something.

6 MR. KOSHY: Yes. We just explained the  
7 surveillance activity, which wouldn't give you  
8 confidence on its future performance. You need to in  
9 some way monitor the condition of that insulation so  
10 that we can build that confidence.

11 Again, you know, this is the small group  
12 of cable where you have this problem. Otherwise, the  
13 rest of the cable is in a dry environment. Next to  
14 selectable sealed-in concrete, you know, these cables  
15 should be the most reliable piece of equipment in a  
16 plant, you know, should not be failing for about 40  
17 years or, in fact, for 60 years, you know, if it is  
18 the environment and the conditions are right.

19 And I quickly explained before that the  
20 low-voltage cables are included because some of the  
21 early vintage plants have this 480-volt equipment for  
22 safety buses, diesel, and naturalized emergency  
23 service water, and service water equipment.

24 CHAIRMAN WALLIS: The original sentence is  
25 garbled. It doesn't matter. Essentially we have a

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1 period after impact, and that's all right. Scope is  
2 limited.

3 MR. KOSHY: Okay. Again, we just  
4 addressed this issue, why this basic surveillance  
5 tests of operating for a half an hour or two hours  
6 wouldn't be sufficient to gain that confidence for --

7 CHAIRMAN WALLIS: What you do is you put  
8 on them the voltage that they would have in operations  
9 and --

10 MR. KOSHY: No. You actually energize a  
11 --

12 CHAIRMAN WALLIS: Do you actually have to  
13 have current going? Do you have to current going  
14 through these cables to test them or does it have the  
15 voltage applied to them and see if there's a leakage?

16 MR. KOSHY: Yes. There are about eight or  
17 ten techniques in the industry.

18 CHAIRMAN WALLIS: There's a whole lot of  
19 techniques.

20 MR. KOSHY: Yes, yes. And the thing is  
21 the early technique was just apply very high voltage  
22 and make it fail. That was the most crude way of  
23 doing it.

24 MEMBER SIEBER: Meggering.

25 MR. KOSHY: Meggering is another method,

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1 but that has certain weaknesses, too.

2 MEMBER SIEBER: You have reflective  
3 techniques.

4 MR. KOSHY: Yes. Time domain reflects  
5 III, and about six or eight techniques are there. And  
6 there are still some under development. Collectively  
7 you have about two IEEE standards that go into details  
8 of the type of tests available and the level of  
9 confidence that you have based on the type of cable.

10 So depending on if you have a shield and  
11 what kind of shield and what type of rubber material  
12 is used, the level of confidence is different, you  
13 know, depending on the type of test that you do.

14 So there is some industry that two IEEE  
15 standards are available to address that and which one  
16 is better and which one is desired.

17 MEMBER SIEBER: You can get some pretty  
18 high voltages in these cables from switching  
19 transients.

20 MR. KOSHY: That's true.

21 MEMBER SIEBER: It will go well beyond the  
22 rating for a very brief period of time. And sometimes  
23 that's when the insulation fails.

24 MR. KOSHY: Yes.

25 MEMBER BONACA: By "surveillance test,"

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1 you mean surveillance of the equipment and this power  
2 by the cable?

3 MR. KOSHY: Right. You are giving normal  
4 voltage and normal function of a couple of hours, you  
5 know, like in the pump in service inspection or type  
6 of surveillance you will expect to run in for two or  
7 three hours, make sure it is for using the rate of  
8 flow and things like that. That's the type of test  
9 that will not give you a feeling of how good the  
10 insulation is. Will it last for the next two weeks of  
11 runoff?

12 The regulatory basis for our cable  
13 monitoring is we have added that what is seen in bold,  
14 that condition is something that we really did not  
15 have in the first version. And we are essentially  
16 saying that "assess the continuity of the systems and  
17 the condition of the components." So you need to know  
18 the condition of this insulation so that we can have  
19 that confidence on its performance.

20 MEMBER ARMIJO: Could you expand that?  
21 Condition based on electrical properties? Are you  
22 actually looking for physical condition? They're in  
23 accessible.

24 MR. KOSHY: These are inaccessible, but  
25 you do have state-of-the-art techniques available in

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1 electrical testing which will measure the testing of  
2 the insulation.

3 MEMBER ARMIJO: Okay.

4 MR. KOSHY: So if you can establish that  
5 the integrity of the insulation is reasonable, then  
6 you have that confidence that it will not fail in the  
7 most probable cases.

8 MEMBER ARMIJO: Thank you.

9 MR. KOSHY: The question was regarding  
10 multiple cable failures. The only example that we  
11 have collected in light of our efforts is a case where  
12 one insulation failure was in the circulating water  
13 pump, resulted in taking two other substations out  
14 with it.

15 The possibility that we are talking of is  
16 the fault itself causes a transient and sends some  
17 transient current. And if you have some near-failure  
18 equipment, that can be a cause for additional  
19 failures. You know, these are speculative problems.  
20 And this is the only example that we have on record  
21 for that.

22 Now, the modifications that we have done  
23 in light of the comments on this are editorial in  
24 nature, a good part. We revised the scope to include  
25 the above-ground and below-ground duct banks; removed

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1 the broadband spectroscopy because that's not a proven  
2 technique yet, but, again, that could be a technique  
3 available in the future; revised the requested  
4 information to include the type of service so that we  
5 will be able to know if there are repeated failures in  
6 a certain area. And we revised the data collection  
7 time to 60 hours.

8 CHAIRMAN WALLIS: So it would seem that  
9 there is still a gap between your view and the  
10 industry's view.

11 MR. KOSHY: Yes.

12 CHAIRMAN WALLIS: The industry had some  
13 pretty strong comments. And your modifications don't  
14 reflect large changes in response to their comments.

15 MEMBER SIEBER: Right.

16 CHAIRMAN WALLIS: So there would seem to  
17 be still a big gap between your view and the  
18 industry's view. Is that true?

19 MR. KOSHY: I will address that in the  
20 next slides along with the NEI white paper issues, in  
21 slides 16 and 17.

22 CHAIRMAN WALLIS: Okay.

23 MR. KOSHY: We presented this to CRGR.  
24 And CRGR asked us to do two improvements on the  
25 generic letter: to bring the focus on the power

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1 cables itself and also to add a safety-related example  
2 to show the significance of this failure on a plant.  
3 In the package that you have received, we have  
4 incorporated those changes.

5 We received the NEI white paper much after  
6 the comment period on May 1st. I have addressed the  
7 highlights in this coming couple of slides. One is a  
8 graded approach. Again, the number that you see on  
9 the top is the sections that correspond to the NEI  
10 white paper, 6.6.

11 The graded approach for monitoring and  
12 replacement of cables, the bullets are many cables do  
13 not power safety-related equipment; and the other one,  
14 graded approach to replacement and monitoring is best  
15 for safety and business reasons.

16 Our response is that we are only focusing  
17 on those that are significant. That's the very reason  
18 that we are using to bring the scope down to the  
19 maintenance rule. And we mentioned certain systems in  
20 there because to, let's say, overcome the variances  
21 and interpretations on that rule and also because  
22 those examples that we state there are the ones that  
23 have most impact on the plant in the sense affecting  
24 multiple systems.

25 Therefore, these are classified as most

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1 important because of these reasons. And, therefore,  
2 you know, it will be important to prevent the  
3 transients and also in supporting of mitigating the  
4 accident.

5 So that's how we have narrowed the scope  
6 and as to bringing down to only important cables and  
7 not all of the cables at large. And the numbers that  
8 you see in that white paper are some plants have like  
9 300-plus cables. And that won't be within the scope  
10 of maintenance rule.

11 The next one, the recommendations again in  
12 chapter 8, is provide dry environment, prepare for  
13 cable failures, and share failure resolutions.

14 Providing a dry environment -- again, you  
15 know, these are all installed cables. It's not quite  
16 practical. And pumping out would help. It will slow  
17 down the failure, but it cannot prevent the failure.  
18 It may take a little longer. And these cable failures  
19 could affect many systems. And the replacement of  
20 these cables is very time-consuming.

21 So if you have a valid accident mitigation  
22 method and at that time trying to make this cable  
23 replacement could be very difficult because the cables  
24 that run in the same duct banks could be helping the  
25 accident mitigation at that time. And your cable

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1 pulling and taking bus outages would not be desirable  
2 actions when you run into an accident environment or  
3 facing a LOOP or a station blackout.

4 And the technique is available there to  
5 have that reasonable confidence so that we can rely on  
6 these cables for continued operation.

7 That's all we have prepared for presenting  
8 to you. And if you have --

9 MEMBER BONACA: I have a question --

10 MR. KOSHY: Sure.

11 MEMBER BONACA: -- regarding in the  
12 generic letter, you talk about 23 LERs --

13 MR. KOSHY: Right.

14 MEMBER BONACA: -- and two monitor  
15 reports. Then the letter says that you believe that  
16 this is a very small fraction. That is the word used  
17 in the LER in the generic letter, a very small  
18 fraction of the actual failure to take place, which  
19 tells me that the number of failures that happen may  
20 be in the hundreds.

21 What is the projection? What does it mean  
22 that 25 in total is a very small fraction?

23 MR. KOSHY: It's very difficult to make  
24 such an estimate, but let me give a personal  
25 experience that I know of. I was at an AIT for a

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1 plant where they had such a cable failure. At that  
2 time they had six cable failures already when we had  
3 the AIT in the mid '80s. So that is repeated failures  
4 happening at one plant.

5 MEMBER BONACA: Okay.

6 MR. KOSHY: Again, I know of another  
7 Northeastern plant where they have all of these  
8 service water cable and emergency service water cables  
9 going through manholes. And they had splices in that  
10 also. And this manhole gets filled with water. And  
11 when the manhole cover knocks out, that's when you  
12 find out the splice failed. They had also quite  
13 repeated failures.

14 So certain plants may have a higher  
15 susceptibility because of groundwater and the design  
16 uniqueness. There may be some plants in absolutely  
17 dry environment, like WNP 2 in the middle of the  
18 desert. They may not have any cable problems because  
19 it's always dry. and if it all drains, it dries out  
20 so fast. So some plants may be fully exempt from this  
21 problem.

22 If the water table is a guide, those are  
23 the ones where you have high susceptibility and  
24 failures. And some plants are kind of glaringly  
25 different than others.

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1                   MEMBER BONACA: The information you are  
2 requesting is regarding all cables, right, not only  
3 those in a weather condition?

4                   MR. KOSHY: All cables and inaccessible.

5                   MEMBER BONACA: Inaccessible.

6                   MR. KOSHY: Yes.

7                   MEMBER BONACA: Exactly. Okay.

8                   MR. KOSHY: So plants where they did not  
9 have failures would not have anything to report. But  
10 if you had failures, we would like to know them --

11                   MEMBER BONACA: Yes.

12                   MR. KOSHY: -- so that we can kind of  
13 gauge, you know, are there repeated problems, what are  
14 the vulnerabilities, and based on that probably share  
15 the lessons and see if you have to take further  
16 action. Maybe it's down to a few plants. We do not  
17 know that because we lack the data to support that.

18                   And the NEI white paper data shows about  
19 15 plants having about 45 to 50 failures. That could  
20 be an indication because they focused on underground  
21 and medium voltage only.

22                   MEMBER BONACA: But your monitoring  
23 program that you're talking about doesn't deal only  
24 with cables that failed. It deals with cable aging  
25 that may be operable during functional testing that

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1 failed during demand, service.

2 So how are you going to gather information  
3 regarding these kind of cables?

4 MR. KOSHY: Okay. What we are saying is  
5 if those cables are within the scope of maintenance --

6 MEMBER BONACA: Yes.

7 MR. KOSHY: -- and they're underground and  
8 inaccessible, tell us if you have failures. And do  
9 you have a program when they have this susceptibility  
10 for failure to make sure that it wouldn't fail?

11 MEMBER BONACA: I understand.

12 MR. KOSHY: So you're not on the scope.  
13 Tell us what the failure is. And see how you monitor.

14 MEMBER BONACA: Right.

15 MEMBER ARMIJO: I have a question. How  
16 can you have a failure of above-ground inaccessible  
17 cable without water? Is it --

18 MR. KOSHY: Okay. What happens is, you  
19 know, even in some large conduit connections which go  
20 on the surface because of the variance, you get  
21 condensation built in there unless you have a way of  
22 venting it out.

23 MEMBER ARMIJO: Well, it could be a  
24 significant amount of water.

25 MR. KOSHY: You could collect all the

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1 time.

2 CHAIRMAN WALLIS: You get a humid day and  
3 a cold night.

4 MR. KOSHY: For the condensation and --

5 MEMBER SIEBER: You can get cable failures  
6 from things other than water.

7 MR. KOSHY: Yes, other chemicals and other  
8 leeching, yes.

9 MEMBER SIEBER: Chemicals, overheating.  
10 You know, that degrades insulation or defect in  
11 splices, for example, if --

12 MR. KOSHY: Yes. Splices is another  
13 vulnerable point.

14 MEMBER SIEBER: It's handmade.

15 MEMBER MAYNARD: A couple of questions.  
16 On the provided inscription of the frequency of all  
17 inspection testing, monitoring, are you talking about  
18 what is currently in place or are you asking the  
19 licensee to go back to day one for all of what testing  
20 has been done?

21 MR. KOSHY: We are asking for what you  
22 have in place now so that you can put in place such  
23 unanticipated failures.

24 MEMBER MAYNARD: Okay. And the other  
25 thing is, is the staff coordinating in any way? This

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1 is requesting this information to be within 90 days.

2 MR. KOSHY: Right.

3 MEMBER MAYNARD: And it would appear to me  
4 that if the other generic letter on the spurious  
5 actuation gets issued, a lot of the same resources  
6 could be required or needed for a lot of these  
7 activities, both dealing with electrical circuits,  
8 just --

9 MEMBER SIEBER: This one is pretty --

10 MR. KOSHY: We will work with the Generic  
11 Communications Division so that we would be sensitive  
12 to that.

13 CHAIRMAN WALLIS: So what are you going  
14 with the information when you get it?

15 MR. KOSHY: What we are hoping is that  
16 depending on, let's say, the breadth and depth of the  
17 problem as to why widespread, we may have to think of  
18 NRC action if that warrants it. We have --

19 CHAIRMAN WALLIS: You think that there  
20 might be some problem. You have this sort of you  
21 almost call it a fishing expedition, where you get all  
22 of this information. And then you look at it and say,  
23 "Aha. Now we have to do something or not." You're  
24 not quite sure what you are going to find.

25 MR. KOSHY: Okay. We know it is a

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1 significant problem in the light of what I explained  
2 to you.

3 CHAIRMAN WALLIS: There have been events,  
4 right.

5 MR. KOSHY: Yes. We have been having  
6 events, which either the plant is out or disabled  
7 safety systems. And those things kind of give you a  
8 flavor of significance.

9 CHAIRMAN WALLIS: But the result of all of  
10 this information gathering might be that you decide  
11 everything is okay as it is now.

12 MR. KOSHY: If the industry has, let's  
13 say, commitments to prevent such failures, yes. But  
14 if you are seeing failures and repeated failures, we  
15 have to rethink what we should be doing. Okay? We  
16 are not there yet. We need to --

17 MR. MAYFIELD: Professor Wallis, this is  
18 Mike Mayfield from the staff. As we assess the  
19 results we get back from this, we would have to make  
20 a decision whether generic action is warranted or is  
21 there some plant-specific action that is warranted or  
22 things are being managed appropriately as it is. And  
23 we just don't know until we get the results back. We  
24 have enough indicators to make us believe that we need  
25 to go --

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1 CHAIRMAN WALLIS: I think the industry  
2 response to the public comments was everything is  
3 fine, we're doing the right thing now. You just want  
4 the assurance that it really is so.

5 MR. MAYFIELD: That might be the outcome.  
6 And we'll have to see what actually comes in.

7 MEMBER SIEBER: The third question sort of  
8 tips your hand as to what you want. And it says if a  
9 monitoring or surveillance program is not in place,  
10 explain why such a program is not necessary.

11 In other words, here's a plant with  
12 failures. And they're not testing anything.

13 MR. MAYFIELD: We might want to chat with  
14 them a bit.

15 MEMBER SIEBER: You gave them the hint.  
16 You ought to test something.

17 MEMBER BONACA: Or you may have a plant  
18 where there have been no failures and you have no  
19 significant power equipment. Then why should you even  
20 have a test? I mean, then you have a threshold for  
21 saying, "We don't need it."

22 MEMBER MAYNARD: I've got a feeling when  
23 you get all of this, the actual number of failures if  
24 you divide it by the number of plants and the number  
25 of operating years wouldn't look that great, but when

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1 you go to group them, there may be some areas where  
2 you --

3 MR. MAYFIELD: Exactly. And that is not  
4 an uncommon outcome from getting this kind of  
5 information.

6 MR. KOSHY: One thing you find out is the  
7 data that we have at this time is based on normal run  
8 and surveillances, not an extended use of like two,  
9 three weeks. So what we are trying to see is gain  
10 confidence that these cables can continue in service  
11 for two or three weeks if there is a station blackout  
12 or some reason and we can continue to rely on these  
13 cables for that safety function.

14 MEMBER BONACA: Yes. That is a very  
15 important issue, you know, the failure to run. So the  
16 equipment starts, but then it won't run for as long as  
17 it has to. And that's trickier because, I mean, the  
18 number of failures experienced to date doesn't give  
19 you a specific insight on these cables. And that's  
20 their function.

21 MR. KOSHY: Right.

22 MEMBER BONACA: Any additional questions?

23 (No response.)

24 MEMBER BONACA: If not, I thank you for  
25 the presentation.

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1 MR. KOSHY: Thank you.

2 MEMBER BONACA: I think Mr. Marrion of NEI

3 --

4 MR. MARRION: Yes.

5 MEMBER BONACA: -- would like to make a  
6 statement. NEI, of course, produced that white paper  
7 that is quite interesting on this issue.

8 MR. MARRION: Good afternoon. I'm Alex  
9 Marrion, the Senior Director of Engineering at NEI.

10 I do have a couple of comments I want to  
11 make about basically what we heard. We haven't seen  
12 the staff disposition of the public comments that have  
13 been submitted. Nor have we seen the current version  
14 of the proposed generic letter.

15 But I have to tell you I am confused. And  
16 the reason for that confusion is that a couple of  
17 years ago, I received a letter from the Electric  
18 Systems Branch Chief articulating concern with a  
19 potential common mode of medium voltage cables. And  
20 the common mode failure mechanism was water training.  
21 This was based upon a review of 20-some odd licensee  
22 event reports.

23 We had a public meeting with the staff to  
24 understand, get a little more of an understanding of,  
25 their concerns. And we looked into the licensee event

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1 reports, and they had -- I'm trying to remember. I  
2 think there was only one or two that had a potential  
3 for being related to the water-training phenomenon  
4 that the staff was concerned with.

5 But it became clear to us that we needed  
6 to develop a document that would be an educational  
7 piece, if you will, primarily focusing for the  
8 industry, but we also felt that the NRC could possibly  
9 benefit from it. And that was the basic objective for  
10 the white paper that we developed.

11 The purpose for the educational piece was  
12 to articulate a clear understanding of the  
13 water-training phenomenon to articulate our assessment  
14 of the licensee event reports that the staff was using  
15 as a basis --

16 CHAIRMAN WALLIS: You're talking about a  
17 water-training phenomenon?

18 MR. MARRION: Water training, yes.

19 CHAIRMAN WALLIS: Training. Oh, I'm  
20 sorry.

21 MR. MARRION: Yes, water training. I'm  
22 sorry. I've got a cold, and I'm a little congested.  
23 I apologize.

24 CHAIRMAN WALLIS: That's my  
25 misunderstanding. I'm sorry.

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1 MR. MARRION: -- and also provide us a  
2 technically based understanding of the application of  
3 that phenomenon to basic cable configurations and  
4 insulation systems that exist in the power plants  
5 today or not in the power plants but exist in these  
6 applications today.

7 We concluded that you can't make a general  
8 statement that water training is of concern because  
9 it's not applicable to every cable configuration and  
10 insulation system that's in the field today.

11 It appears that the staff is attempting to  
12 require a cable-monitoring program. I'm not familiar  
13 with the details of the maintenance rule, but I know  
14 that the equipment to which these cables are  
15 terminated are monitored in the maintenance rule.

16 And since the cables aren't active  
17 components, I'm not sure whether they should be  
18 included in the maintenance rule or not. But  
19 fundamentally if the staff expectations and basis in  
20 this generic letter are not clear, you have the  
21 potential of a generic letter basically undermining a  
22 regulation.

23 I don't know if the staff has done a  
24 review with the maintenance rule folks within NRR, but  
25 I would recommend that be done before this is

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1 submitted.

2 CHAIRMAN WALLIS: You're implying this,  
3 but, in fact, they just say they're gathering  
4 information. And it's not clear that they intend to  
5 do anything which would change the regulation in any  
6 way or interfere with regulation. You don't know what  
7 they're going to do.

8 MR. MARRION: And the licensee has to  
9 document a justification of why they don't have a  
10 cable-monitoring program. That is --

11 CHAIRMAN WALLIS: But you're implying that  
12 something downstream is going to require this. That's  
13 not actually a --

14 MR. MARRION: No. I'm implying there may  
15 be a conflict between what the generic letter is  
16 asking for and what is required by the --

17 CHAIRMAN WALLIS: You're asking for  
18 information, rather.

19 MR. MARRION: Well, okay. That's one way  
20 of looking at it. It is a request for information or  
21 an attempt to require a cable-monitoring program. And  
22 I'll let you folks decide how you want to do that if  
23 they want to interpret that.

24 I think that, you know, the staff has made  
25 some comments about, you know, what their concern is.

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1 And it's not clear to me. I have to tell you I'm  
2 confused. Maybe it's because of our involvement over  
3 the past several years, but I have yet to see any kind  
4 of risk analysis or any kind of statistical analysis  
5 conducted by the NRC to articulate some level of  
6 confidence that they find unsatisfactory relative to  
7 the performance of the cable or the equipment.

8 We have attempted to do some statistical  
9 work in our white paper based upon the survey that we  
10 had conducted. I'm not happy with the fact that we  
11 didn't get 100 percent of the utilities to respond,  
12 but we got on the order of 80 percent, I think, 79.  
13 something. That has some benefit.

14 My concern at this particular point is  
15 when the generic letter is finally issued, based upon  
16 what I heard this afternoon, we're going to have to  
17 request a meeting, a public meeting, and probably  
18 document further clarification of what the NRC is  
19 really interested in this information request as they  
20 go forward because it's not clear at this particular  
21 point in time. And that's all I have to say. I would  
22 be more than happy to answer any questions you may  
23 have.

24 (No response.)

25 MR. MARRION: Okay. Thank you.

1 CHAIRMAN WALLIS: You're welcome.

2 You were suspicious that if they gather  
3 this information, then they might use it to require  
4 something which they wouldn't be able to do if they  
5 didn't have the information?

6 MR. MARRION: No. It's not clear what  
7 concern is trying to be addressed by the request for  
8 information.

9 CHAIRMAN WALLIS: Well, the concern is  
10 that these cables will fail. It's a simple concern.

11 MR. MARRION: Well, where does that  
12 concern stop? Do you stop at these cables or do you  
13 continue that concern at the equipment, et cetera,  
14 that is under continuous surveillance programs and  
15 testing? I mean, where does it end?

16 And it's a concern about having possible  
17 unanticipated failures? Well, where do you stop  
18 asking that question now that you started on medium  
19 voltage cables and the small population of medium  
20 voltage cables, I suspect?

21 So there are some real issues that have to  
22 be addressed here because the utilities are going to  
23 want to be responsive to the generic letter. My job  
24 is to make sure that we understand it adequately so  
25 the utilities will be responsive, but right now I'm

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1 not sure we have that understanding.

2 MEMBER BONACA: Well, if I understand it,  
3 I mean, the issue has to do with two things. One is  
4 inaccessible equipment that cannot be visually or  
5 other means inspected -- so it's a very narrow family  
6 -- and then equipment that is really in accepted  
7 applications.

8 And clearly equipment is seeing a water  
9 condition or wetness that -- so it's a pretty unique  
10 and narrow population, but I think at least I am  
11 interested to know what kind of equipment is being  
12 powered by this kind of cable out there. And if it is  
13 something critical, a generic letter or whatever,  
14 connection to off-site power, you know, it's a unique  
15 concern.

16 I mean, we addressed it and discussed it  
17 during license renewal because it was significant.  
18 And the industry and the NRC worked together on a goal  
19 inspection program for those cables.

20 And where does the aging start? I mean,  
21 does it start with a theatre of operation or does it  
22 start before? Clearly there is degradation taking  
23 place at some point. I realize I don't know all there  
24 is necessary to know about that.

25 MR. MARRION: If I may just offer a couple

1 of comments?

2 MEMBER BONACA: Yes?

3 MR. MARRION: The aging phenomenon begins  
4 from the time that the cable is shipped from the  
5 manufacturer's facility.

6 MEMBER BONACA: That's right.

7 MR. MARRION: And it's exacerbated by  
8 environmental conditions as well as operational  
9 conditions that wind up stressing the cable insulation  
10 system. And a submerged, wetted environment for  
11 certain insulation systems has the potential of  
12 increasing the aging or the rate of aging degradation,  
13 et cetera. That is well-known.

14 The equipment that's affected here  
15 includes diesel generators at some plants at 4,000 or  
16 4,160 volts as well as other plants at 6.9 kV. I  
17 don't know about -- I think one of the staff was --  
18 Tom made a comment about some diesel generators  
19 operating in the 480 volts. If that's indeed the  
20 case, then that's indeed the case.

21 But mean voltage cable in the industry is  
22 characterized as 2,000 to 15,000 volts. So I'm hoping  
23 that the generic letter will be very clear of  
24 articulating the 480-volt applications. And is it  
25 only for that particular piece of equipment or is it

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1 for something else? That's one of the points of  
2 clarity that's needed.

3 We tried to capture in our white paper --  
4 and I hope you've read it; we've made it available to  
5 you -- the current state of understanding of cable  
6 insulation systems at this voltage level and  
7 underground applications and which insulation systems  
8 are susceptible to water damage over time.

9 We have encouraged the utilities to  
10 prepare for such failures because if you look at the  
11 age of the fleet, we are approaching the end of  
12 service life of a lot of these cables. It's typically  
13 30, 35, 40 years based upon normal environmental  
14 conditions.

15 And our recommendation to the industry was  
16 don't wait for a failure before you have to deal with  
17 this problem because this is not the kind of cable  
18 that you typically keep large quantities in inventory  
19 at the warehouse, et cetera. And if you're not  
20 prepared, you will have an extended outage should you  
21 have such a failure.

22 I don't know if the generic letter is  
23 going to speak to that, but I also know that there is  
24 not a cable-monitoring system that is applicable and  
25 effective and available to the utilities today.

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1           There are some testing techniques that are  
2 effective for certain kinds of insulation  
3 configurations. And our white paper speaks to that.  
4 But based upon the information I have gotten from  
5 EPRI, who is pursuing research in this area, et  
6 cetera, that there isn't one technique that would be  
7 useful. So okay?

8           MEMBER BONACA: Thank you.

9           MR. MARRION: Thank you.

10          MEMBER BONACA: Yes. I think we're  
11 scheduled for some closing remarks. Is there?

12          MR. MAYFIELD: Just very briefly. We  
13 believe we have articulated why we need the generic  
14 letter. If indeed there is substantive confusion or  
15 misunderstanding once we have published the generic  
16 letter, we would, as always, be more than willing to  
17 meet with the industry and make sure that there is a  
18 common understanding of what we're asking for.

19          This generic letter has been in process  
20 for a while. And we do believe we need to move  
21 forward to get the generic letter published and allow  
22 licensees the opportunity to engage with it. We will  
23 be mindful of any conflicts with other generic  
24 communications that are going forward where we may be  
25 imposing unreasonable time constraints and resource

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1 constraints on the licensees. That's something that  
2 we will pay attention to and go back and pulse with  
3 the generic communication staff and the other  
4 technical staff to make sure we're online there.

5 With that, unless the Committee has other  
6 questions for the staff, I believe we have presented  
7 to you the information that we wanted to present. And  
8 we look forward to receiving a letter from you. Thank  
9 you.

10 MEMBER BONACA: Any other questions for  
11 Mr. Mayfield?

12 MR. FALLON: I have a question. Mike  
13 Fallon with Constellation Energy.

14 For the license renewal applicants that  
15 have submitted under the GALL report, these cables are  
16 all in the scope of license renewal, have been  
17 addressed in their applications. Are they being asked  
18 to resubmit this information again?

19 MR. KOSHY: This is Thomas Koshy.

20 This generic letter will fall under the  
21 Part 50 program, in which case we are addressing,  
22 let's say, something more than what was addressed in  
23 the renewal program. So there is a need for making  
24 separate submittal to the NRC in response to this  
25 generic letter.

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1 MR. FALLON: All of the cables that you  
2 have addressed, all of the safety-related cables, are  
3 in the scope of license renewal. And whether they're  
4 480-volt or they're medium voltage, they're addressed  
5 in those applications.

6 MR. MAYFIELD: Okay. Let me comment.  
7 This is Mike Mayfield from the staff.

8 You raise a good point. It is something  
9 we will look at and make sure we're not asking you to  
10 unnecessarily duplicate information. But that is a  
11 fair question, something that we'll make sure that --

12 MEMBER BONACA: Well, I am not aware that  
13 license renewal applications have the summary of all  
14 of the failures that have taken place. We are going  
15 to get to the information.

16 MR. MAYFIELD: We don't think we are in  
17 conflict, but it's a fair question. And we'll look to  
18 make sure we are not asking an unreasonable question.

19 CHAIRMAN WALLIS: But you will be looking  
20 at plants which doesn't necessarily have license  
21 renewal in prospect.

22 Are we through with this item now or --

23 MEMBER BONACA: Are there additional  
24 questions for the staff, for industry, for us?

25 (No response.)

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1 MEMBER BONACA: If none, I think it's  
2 over.

3 CHAIRMAN WALLIS: Thank you.

4 MEMBER BONACA: And we open it up back to  
5 you, Mr. Chairman.

6 CHAIRMAN WALLIS: Now, I really am  
7 reluctant to take a break for an hour. I wonder if we  
8 couldn't work on -- is it okay, staff who is an expert  
9 on this? Can we work on Mario's letter on this issue  
10 right now on just a preliminary basis?

11 Let's go off the record and work on his  
12 letter for half an hour or an hour.

13 MEMBER SIEBER: We have to come back.

14 CHAIRMAN WALLIS: Can we do that? You're  
15 not ready? We do have a draft letter. Will the  
16 Committee agree to work on his letter? We can discuss  
17 it now, but I think we can go off the record and  
18 discuss our reaction to this generic letter and work  
19 on our letter until about 3:00 o'clock. Is that okay  
20 with the Committee?

21 So let's do that. We'll come off the  
22 record now, and we will work on this letter until  
23 about 3:00 o'clock. We'll have some discussion now  
24 off the record.

25 (Whereupon, the foregoing matter went off

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1 the record at 2:25 p.m. and went back on  
2 the record at 3:18 p.m.)

3 CHAIRMAN WALLIS: We will come back on the  
4 record, come back into session.

5 CHAIRMAN WALLIS: The next item on the  
6 agenda is, let's see now, interim staff guidance. Is  
7 that what it is?

8 MEMBER BONACA: Yes.

9 CHAIRMAN WALLIS: And I will again call on  
10 Mario Bonaca to lead us through this one.

11 MEMBER BONACA: Okay.

12 4) INTERIM STAFF GUIDANCE AGING MANAGEMENT PROGRAM

13 FOR INACCESSIBLE AREAS OF BOILING WATER REACTOR

14 (BWR) MARK I CONTAINMENT DRYWELL SHELL

15 4.1) REMARKS BY THE SUBCOMMITTEE CHAIRMAN

16 MEMBER BONACA: We have the staff here to  
17 provide us with an overview on the proposed license  
18 renewal interim staff guidance on steel containment of  
19 BWR Mark I containments.

20 We have reviewed a number of BWRs. And  
21 we have often asked the question on the status of the  
22 steel liner. And we have seen different proposals by  
23 licensees, some of them planned inspections, only  
24 metric inspections. Some of the others don't.

25 And the staff is using a successful

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1 process that has been successful in most of the  
2 license renewal applications to date, the ISG process,  
3 as a means of proposing an approach that they expect  
4 the licensees to follow regarding this particular  
5 item.

6 And so the staff has come here to give us  
7 an overview of this process and what they are  
8 proposing to do. And I will let the staff go ahead.  
9 I don't know if Mr. Gillespie or Mayfield --

10 MR. GILLESPIE: Yes. If I could, just  
11 some opening comments to put in context what Linh and  
12 Hans are going to go through. Not only did we do a  
13 couple already, but we've got something like seven  
14 Mark I's lined up in the queue. And we have a number  
15 of very controversial ones in New Jersey,  
16 Massachusetts, and Vermont, where there is actually a  
17 lot of public interest. And we had no position on the  
18 liner itself.

19 There are some caveats or I'm going to say  
20 some wiggle room in this position I'd like to  
21 highlight to the Committee by way of how the staff is  
22 approaching this because a question at the meeting  
23 yesterday at Monticello was, why is it different plant  
24 to plant if you're trying to apply a consistent  
25 approach.

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1           This is kind of an approach for the plant  
2           that's got almost like the optimum conditions, of  
3           which Monticello with their leakage control programs  
4           and some things they were doing was.

5           Browns Ferry, an earlier one, which  
6           committed to doing some other measurements, actually  
7           had an operating history of having leaks. And so they  
8           had moisture content in there. And so we actually  
9           have -- this is a minimum condition, as we would look  
10          at it.

11          And there are also some wiggle words,  
12          quite honestly, in this. And that's where it says  
13          first you have to establish a degradation rate,  
14          basically. And then if you get moisture, this  
15          basically treats moisture in the outside of the shell  
16          the same as visible accelerated corrosion on the  
17          inside.

18          And we're using the ASME code kind of  
19          enhanced inspection, but, instead of referencing the  
20          code, we described the enhanced inspection in it in  
21          case the code changes in the future.

22          So we're bringing definition to an  
23          equivalence to inside and outside indications. And  
24          there is still a lot of room on how you establish the  
25          rate and what is the credibility of the rate.

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1           And so if you have a history as a facility  
2 of having leakage and, therefore, moisture in there,  
3 then I think the Committee should expect the staff in  
4 establishing the rate in those wiggle rooms because it  
5 says if you have moisture, reestablish your rate again  
6 -- and the only way to factually reestablish the rate  
7 is likely do a UT measurement and then connect the  
8 dots again. Literally a simplistic way of looking at  
9 it is a regression line between the now additional  
10 point.

11           And so Hans in his efforts as a reviewer  
12 still has a lot of room in what are the uncertainties  
13 in establishing the rate. And it's those  
14 uncertainties which kind of differentiate one plant  
15 from another. How do you reduce those uncertainties  
16 given different operating histories?

17           And so that's really how come Monticello  
18 is different from Browns Ferry. It's strictly  
19 operating history and the uncertainty involved with  
20 known moisture leak on multiple occasions.

21           So, with that, let me turn it over to Linh  
22 because that's just kind of the context. Linh, take  
23 it away.

24           4.2) BRIEFING BY AND DISCUSSIONS WITH  
25           REPRESENTATIVES OF THE NRC STAFF

1 MS. TRAN: Good afternoon. My name is  
2 Linh Tran. And I'm the Project Manager with the  
3 Division of License Renewal. And this is Hans Ashar.  
4 He's a senior civil engineer with the Division of  
5 Engineering.

6 We are here this afternoon to present the  
7 proposed license renewal interim staff guidance for  
8 the inaccessible area of the BWR Mark I drywell  
9 containment shell.

10 The purpose of this ISG is to provide  
11 guidance to future applicants on the information that  
12 is needed to be included in the license renewal  
13 applications for addressing the inaccessible area of  
14 the drywell shell.

15 Now, the proposed ISG here does not impose  
16 any no new technical requirement. And in previous  
17 license renewal application review by the staff, we  
18 usually can obtain the information in the applications  
19 or through the request for additional information.  
20 And usually we will get the information from the  
21 applicant.

22 The information provided by the applicant  
23 is sufficient for the staff to make its determination.  
24 However, it is not the most efficient way because of  
25 the RAI back and forth. And in an effort to reduce

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1 the number of RAIs, this proposed ISG would identify  
2 the information up front, so for the future  
3 applicants, what they should include in the LRAs, I  
4 guess, to make the staff review more efficient,  
5 information such as inspection results or analysis  
6 that would help the staff make the determination  
7 whether the containment would perform its intended  
8 function for the period of extended operation.

9 Past operating experience in the Mark I  
10 steel containments indicate that when water is  
11 discovered in the bottom outside area of the drywell  
12 shell, the most likely cause could be the water  
13 seeping through the inaccessible area.

14 And in slide 10 in your handout, I have a  
15 picture of the drywell shell. It is an inverted light  
16 bulb. That indicates where the inaccessible area  
17 would be.

18 And this area is the area for the distance  
19 between the drywell shell -- did you do slide 10?;  
20 that's a picture there; yes -- where the surrounding  
21 concrete structure is too small for successful  
22 performance of visual inspection. That's the area  
23 right there. The gap is usually two inches, three  
24 inches.

25 CHAIRMAN WALLIS: You used the term

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1 "seeping." It's really any water that gets there from  
2 any reason whatsoever.

3 MS. TRAN: Correct.

4 CHAIRMAN WALLIS: And "seeping" is used as  
5 a general term.

6 MS. TRAN: Term, correct.

7 CHAIRMAN WALLIS: It may not seep. It may  
8 actually flow or --

9 MS. TRAN: Flow through, right.

10 MR. ASHAR: The area that we are  
11 concentrating on is between the shell, between the  
12 shell and the concrete in the back, in between the  
13 insulation --

14 MEMBER BONACA: No, no, no.

15 MR. ASHAR: Oh, I'm sorry. Wrong place.

16 MS. TRAN: Right. That's --

17 MEMBER APOSTOLAKIS: It is between what  
18 and what?

19 MR. ASHAR: Between the freestanding steel  
20 containment --

21 MEMBER BONACA: Between the light bulb and  
22 the --

23 CHAIRMAN WALLIS: There's a space right  
24 there.

25 MR. ASHAR: And mostly it is filled with

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1 insulation.

2 MEMBER APOSTOLAKIS: How does the water  
3 get there?

4 MR. ASHAR: Water gets into -- I'm going  
5 to explain. There are three basic sources of water  
6 that we have seen so far in the operating history.  
7 One can be called because of the -- we don't have any  
8 picture of the actual area.

9 MS. TRAN: No. This is it.

10 MR. ASHAR: This is it. In this area,  
11 there are bellows, bellows between the driver.

12 CHAIRMAN WALLIS: We saw them this  
13 morning.

14 MR. ASHAR: Yesterday you may have seen  
15 it, yes. And those bellows can crack. And then they  
16 can give a seepage into the trough, which collects the  
17 water.

18 Now, if the drain, which is supposed to  
19 drain out all the water from there, is full or is not  
20 working properly, the water can accumulate in the  
21 trough area, which has been kept just for that  
22 purpose. And it may all flow in coming to this area  
23 here.

24 CHAIRMAN WALLIS: It's lower.

25 MR. ASHAR: Because it is not showing

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1 better this particular detail, this is not good  
2 enough. Yesterday it was a very nice picture here.

3 CHAIRMAN WALLIS: But in order to refuel,  
4 you have to flood the upper region there.

5 MR. ASHAR: That is correct.

6 CHAIRMAN WALLIS: And some of that water  
7 can get down on the outside.

8 MEMBER APOSTOLAKIS: Okay. Thank you.

9 MS. TRAN: Now, in this --

10 VICE CHAIRMAN SHACK: Now, is that the  
11 only source of the water, I mean?

12 MR. ASHAR: No, no. There are two or  
13 three we found so far. Okay? One is a cracking of  
14 bellows. Second one is there is a refueling seal  
15 between the bottom of the trough, concrete trough.  
16 And there is a systematic way of draining it out  
17 through a drainage. But drain gets clogged. And the  
18 water comes through that area. It collects in the  
19 trough again and goes into between the concrete and  
20 the drywell shed.

21 Clog one is the reactor cavity wall. You  
22 have a stainless steel liner on it. And stainless  
23 steel liner gets -- they may do for any reason. And  
24 the water goes directly from concrete into that gap in  
25 between the two.

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1                   These are three reasons we have identified  
2                   so far.

3                   CHAIRMAN WALLIS:   So what clogs this  
4                   drain?   You said the drain gets clogged?

5                   MR. ASHAR:   It is because of negligence on  
6                   the part of the various --

7                   CHAIRMAN WALLIS:   Yes.

8                   MR. ASHAR:   -- not to monitor them  
9                   correctly.   Now they have come to their senses.   And  
10                  they started telling us they are monitoring, they are  
11                  doing this, they are doing that.

12                  MEMBER BONACA:   The drains are down from  
13                  the sand cushions, right?

14                  MR. ASHAR:   They are separate.   After the  
15                  water leakage, it is the sand cushion area.   Then  
16                  there are drains to -- actually, those drains were  
17                  meant for making sure the scent does not go away.   And  
18                  if it is, then they can collect them and put them back  
19                  the same.   That was the whole idea behind it.

20                  But it has been used nowadays as a  
21                  water-collecting/catching kind of a thing.   It is an  
22                  indirect function of that particular drain, but that  
23                  shows that water is coming in.   If the drains into  
24                  that room, if it shows any kind of water in the Torus  
25                  room, then it shows that there is a water leakage from

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1            somewhere up above that is getting into that area.

2            CHAIRMAN WALLIS:  It drains into the room  
3            around the Torus?  It just drips down the wall  
4            somehow?

5            MEMBER SIEBER:  Yes.

6            MR. ASHAR:  The water comes from here.

7            CHAIRMAN WALLIS:  That is a four-inch  
8            drain pipe.  It just drains down the wall?

9            MR. ASHAR:  This is a sand pocket here.

10           CHAIRMAN WALLIS:  Where does it go to when  
11           it drains out of that four-inch drain pipe?

12           MEMBER SIEBER:  Onto the floor.

13           CHAIRMAN WALLIS:  It just drains onto the  
14           floor?

15           MR. ASHAR:  Unless they are collectors.  
16           Some people have started collecting them into some  
17           kind of a jar.  But most of them, yes, it was going  
18           onto the floor.

19           MS. TRAN:  It goes onto the floor, yes.

20           MR. ASHAR:  There is where they find out.

21           MEMBER BONACA:  Now, some licensees have  
22           the drainage and some don't.  That depends on the --

23           MR. ASHAR:  Well, some licensees have  
24           drains of the sand pocket area here.

25           MEMBER BONACA:  Down at the low point.

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1 MR. ASHAR: Some people have drains at  
2 this area somewhere on the top of it.

3 MEMBER SIEBER: I think all of them --

4 MR. ASHAR: And if it is on the top of it,  
5 then there has to be sealing between --

6 MEMBER SIEBER: All of them have the top.

7 MR. ASHAR: -- the concrete and the --  
8 yesterday we saw in the Monticello case, it was a  
9 seal, which was a galvanized steel shield between the  
10 sand pocket area and the above area. So it prevents  
11 the water from getting in.

12 MEMBER BONACA: The had a few ounces of  
13 water, too, at some point.

14 MR. ASHAR: Yes, yes.

15 MEMBER BONACA: So they must have come  
16 also from the top.

17 MR. ASHAR: In the case of Monticello,  
18 there were no signs like that. We did not see.

19 MEMBER BONACA: There were only a few  
20 ounces of water, they said.

21 MEMBER MAYNARD: Yes, but they speculated  
22 that that water had actually come from another source  
23 because of the two or three-inch sand pipe there.

24 MEMBER BONACA: On the sand pipe there,  
25 yes.

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1 MR. ASHAR: They could explain when you  
2 ask that question.

3 CHAIRMAN WALLIS: Well, if it drains down  
4 that four-inch drain pipe, I would assume that the  
5 sand is full of water.

6 MEMBER SIEBER: Yes.

7 MEMBER MAYNARD: Right. That is not the  
8 low point.

9 CHAIRMAN WALLIS: There is a lot of water  
10 there before it drains down the pipe. The sand  
11 pocket, the sand --

12 MR. ASHAR: The sand pocket has to be  
13 sucked up completely.

14 CHAIRMAN WALLIS: The sand cushion is  
15 saturated with water first.

16 MR. ASHAR: Right.

17 MEMBER SIEBER: A number of plants have  
18 drains at the bottom of the sand --

19 MR. ASHAR: At the bottom --

20 MEMBER SIEBER: It would make more sense  
21 to --

22 MR. ASHAR: Some people have at the bottom  
23 of the sand pocket area drains with -- again,  
24 actually, it is to retain the sand inside. So that  
25 all flowing sand can be collected, but if they can use

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1 it at the --

2 MEMBER SIEBER: What is the purpose of the  
3 sand in the first place?

4 MR. ASHAR: Okay. See, this is the --

5 MEMBER SIEBER: Got a cushion?

6 MR. ASHAR: -- concrete area -- okay? --  
7 here. And this one when the shell expands under  
8 pressure --

9 MEMBER SIEBER: It is room to --

10 MR. ASHAR: -- it gives you some room to  
11 budge in.

12 MEMBER SIEBER: Expand? Okay. But the  
13 whole bottom of the shell sits on concrete? So you  
14 don't worry about corrosion below the sand?

15 MR. ASHAR: We do in some cases. We do to  
16 some extent, yes. If --

17 MEMBER SIEBER: How do you address that?  
18 You can't get to it because the top of it is concrete,  
19 too.

20 MR. ASHAR: If there is an appreciable  
21 collection of water in the sand bucket area, there is  
22 a chance that the water might have gone between the  
23 steel shell and the concrete.

24 MEMBER SIEBER: Right.

25 MR. ASHAR: But those cases, we have not

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1 found many so far except one, one case.

2 MEMBER SIEBER: You probably don't know --

3 MR. ASHAR: Yes, sir.

4 MEMBER SIEBER: -- you've got a concrete  
5 pad, a hemispherical pad, and then concrete above  
6 that.

7 MR. ASHAR: Right.

8 MEMBER SIEBER: And so there's no way to  
9 make a measurement.

10 MR. ASHAR: We know.

11 MS. TRAN: The interior.

12 MEMBER SIEBER: You can't get to the  
13 inside unless you cut the concrete out.

14 MR. ASHAR: Unless you cut the concrete or  
15 there are some new methods that have been developed in  
16 the NRC's research program, which have guided matters,  
17 but they are not yet being calibrated and haven't been  
18 used extensively by anybody.

19 So there are potential uses for those  
20 things under these examinations, but we have not seen  
21 them use it so far. We have just put one report from  
22 Oak Ridge National Lab in e-mail items so that people  
23 can look at that report and see if it is applicable  
24 for them.

25 CHAIRMAN WALLIS: Didn't someone yesterday

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1 say they actually made holes in that concrete in order  
2 to inspect?

3 MR. ASHAR: Yes.

4 MS. TRAN: Monticello.

5 MEMBER SIEBER: Next to the pedestal.

6 MR. ASHAR: Yes. They had to do that.

7 MEMBER SIEBER: But that is about as far  
8 as you can go because --

9 MR. ASHAR: That is as far as you can go  
10 right now, right.

11 MEMBER SIEBER: It's really thick in  
12 between.

13 MR. ASHAR: Yes. You can go up to here in  
14 the sand pocket area. Anything below that, if there  
15 is a --

16 MEMBER SIEBER: Of course, the sump is in  
17 there, too.

18 VICE CHAIRMAN SHACK: But typically,  
19 though, I mean, your experience is that there is no  
20 water there or that they all collect water?

21 MR. ASHAR: Typically the water has been  
22 very little. There has been water except in one case  
23 in the case of, I think it is, Dresden III, when they  
24 had to put firewater in here to extinguish a fire in  
25 the gravel area here --

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1 VICE CHAIRMAN SHACK: Well, that would do  
2 it.

3 MR. ASHAR: -- because of a summation  
4 fire. I don't know why.

5 MEMBER SIEBER: Good place to get a fire.

6 MR. ASHAR: But there was a fire there.  
7 They put a lot of water into it. And this whole area  
8 becomes soft here in the sand --

9 CHAIRMAN WALLIS: I'm interested to see  
10 when the sand gets full of water by some mechanism how  
11 it ever gets out. How does it ever get dry?

12 MR. ASHAR: With sand you --

13 CHAIRMAN WALLIS: If you had water access,  
14 suppose the bellows fails --

15 MR. ASHAR: Except the temperature --

16 CHAIRMAN WALLIS: -- water runs down.

17 MEMBER SIEBER: Aren't there drains at the  
18 bottom of this thing pushing it, right?

19 MR. ASHAR: Some have. This one is not  
20 shown here. There is a drain right here.

21 CHAIRMAN WALLIS: There is a drain there?

22 MR. ASHAR: There is a drain.

23 MEMBER SIEBER: Okay.

24 CHAIRMAN WALLIS: So that is how you draw  
25 out the sand? You just let it soak out?

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1 MEMBER SIEBER: It drips into where the --

2 MR. ASHAR: The temperature in the drywell  
3 in general in that area is close to about 130-140  
4 degrees. So it helps a little bit drying --

5 CHAIRMAN WALLIS: It evaporates the water?

6 MR. ASHAR: To some extent, not -- I mean,  
7 I have been given those explanations by various  
8 applicants, I know, what does this, but I do not  
9 believe everything they say. But --

10 CHAIRMAN WALLIS: Okay.

11 MS. TRAN: Slide five, please.

12 MEMBER SIEBER: You say the space between  
13 the concrete and the shell and the drywell is filled  
14 with insulation.

15 MR. ASHAR: Yes, there is insulation in  
16 there.

17 MEMBER SIEBER: What is it, some kind of  
18 fiber of some sort?

19 MR. ASHAR: I think so, yes. In one case  
20 we found that insulation was bad enough that it has  
21 chloride and all those contaminants. So when the  
22 water came in, it came with contaminated water. And  
23 that started accelerating the corrosion rate.

24 MEMBER SIEBER: That would do it. The  
25 insulation holds the water all up and down.

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1 MR. ASHAR: Up and down.

2 MR. GILLESPIE: Hans, I think it is  
3 important here that we're not talking in every case  
4 about any single containment.

5 MR. ASHAR: Right.

6 MR. GILLESPIE: What you have hit on is  
7 exactly what I tried to say in the beginning. The  
8 specific designs are so variant that we have really  
9 found out in doing these reviews that a Mark I  
10 containment is not a Mark I containment when you're  
11 looking at the drain details and the drain location.  
12 It's a function of the age, the AE. And, for example,  
13 Nine Mile actually put cameras up to ten-inch drains  
14 that they have and looked up in there, and it was  
15 dust.

16 And so before we assume that this thing is  
17 always full of water on everyone, there is a great  
18 variance between each unit. The design is different.  
19 And what licensees have done in the past to verify  
20 either the presence or absence of water is very  
21 different.

22 And so it's not like there is a universal  
23 answer to each one of these. Each one really is  
24 different.

25 VICE CHAIRMAN SHACK: Now, again, just on

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1 that, are all of the ones filled with insulation or  
2 are some of them actually air gaps?

3 MEMBER ARMIJO: I thought Monticello was  
4 an air gap based on yesterday's presentation.

5 MR. ASHAR: It is called air gap. I mean,  
6 in general, the terminology used is air gap.

7 VICE CHAIRMAN SHACK: But, I mean, is it  
8 typically filled with insulation?

9 MR. ASHAR: Typically it is a concrete  
10 General Electric design. It has the insulation in  
11 most cases. There might be a plant or two that may  
12 not have it available, but there might be some plants.

13 MEMBER SIEBER: You almost need it to be  
14 the form for pouring the concrete.

15 MR. ASHAR: Right, exactly.

16 MEMBER SIEBER: You need something in  
17 there to do that. Otherwise you don't have a gap at  
18 all. And one of the ways you get water down there is  
19 you have to take that refueling seal out after you  
20 refuel in order to put the drywell back together. And  
21 the process of doing that leaves a lip of water --

22 MR. ASHAR: Right.

23 MEMBER SIEBER: -- all around where the  
24 seal --

25 MR. ASHAR: Right.

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1 MEMBER SIEBER: -- used to be. It can  
2 only go down.

3 CHAIRMAN WALLIS: Now, we had a plant  
4 recently which had bulges in this realignment.

5 MR. ASHAR: I want to clarify two things.  
6 Okay?

7 CHAIRMAN WALLIS: It was Brunswick.

8 MR. ASHAR: There is a problem with the  
9 terminology. The first thing, when we talk about the  
10 drywell shell, it is a freestanding drywell steel  
11 shell. And when we talk about the liner, it is  
12 attached to concrete with some kind of anchorages.

13 And that is where we use the word "liner."  
14 But I have seen people using very loosely "drywell  
15 liner" here. It is not true. Okay? We are going to  
16 clarify the terminology in the next -- there is no --

17 MEMBER SIEBER: The one plant that has the  
18 liner, the shell, the structural member is the  
19 concrete, the subject of the code.

20 CHAIRMAN WALLIS: Yes, that's right.

21 MEMBER SIEBER: So you can tolerate some  
22 amount of corrosion as long as you --

23 CHAIRMAN WALLIS: So the liner just sits  
24 on the --

25 MEMBER SIEBER: -- maintain tightness.

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1 CHAIRMAN WALLIS: Okay. So the liner sits  
2 on the concrete, which is why it bulges.

3 MEMBER SIEBER: Just in that one plant.

4 CHAIRMAN WALLIS: This one is  
5 freestanding, this one.

6 MEMBER SIEBER: Yes.

7 MR. ASHAR: The one we are showing is a  
8 freestanding shell plus the liner.

9 MS. TRAN: Okay. Slide five. For some  
10 applications, just the information provided was  
11 included in the various sections of the LRA. And for  
12 other applications, the information was obtained to  
13 request for additional information.

14 As a result, the proposed ISG recommended  
15 that future applicants provide a plant-specific aging  
16 management program that would address the loss of  
17 material for the accessible area of the drywell shell.

18 So the recommendations that the applicant  
19 should be included in there, in the aging management  
20 program to develop a corrosion rate that is really  
21 inferred from past UT examination or establish a  
22 corrosion rate using representative samples in similar  
23 operating condition.

24 CHAIRMAN WALLIS: I would think the  
25 corrosion rate was so low that it would be difficult

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1 to measure. Really, you could say that it's less than  
2 a certain amount.

3 MS. TRAN: Less than, then. No minimum  
4 design.

5 CHAIRMAN WALLIS: That's good enough. You  
6 don't actually want them to determine what it is  
7 because you might be so low that you can't measure it.  
8 But if it's less than a certain amount, that would be  
9 acceptable, wouldn't it?

10 MR. ASHAR: In general, subsection IWE of  
11 the ASME code allows close to about ten percent  
12 allowance --

13 CHAIRMAN WALLIS: I know, but --

14 MR. ASHAR: -- some localized corrosion.

15 CHAIRMAN WALLIS: But if there is no water  
16 there, the corrosion rate may be essentially zero.

17 MS. TRAN: Correct.

18 CHAIRMAN WALLIS: And so establishing a  
19 zero thing is very difficult to do.

20 MEMBER SIEBER: Really, what you are  
21 trying to do is to determine how close you are to  
22 min wall.

23 MR. ASHAR: The min wall, right, minimum  
24 wall.

25 MEMBER SIEBER: And by plotting the

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1 reduction in thickness, you can determine when you are  
2 going to hit min wall. At that point you no longer  
3 meet the code for that pressure vessel.

4 VICE CHAIRMAN SHACK: How do I do this?  
5 Do I have to have multiple UT readings from that  
6 inaccessible portion of the shell? Can I demonstrate  
7 that mine is always dry?

8 MEMBER MAYNARD: You could develop a way  
9 that you had data from the --

10 MR. ASHAR: Two in the same location.

11 MEMBER MAYNARD: If an applicant comes in  
12 and they don't have previous data, I'm not sure how  
13 they develop a rate.

14 MS. TRAN: This is what we learned in  
15 putting this together. They will have one point at  
16 the beginning, you know, the design of the fabrication  
17 point. And then as a result of generic letter 87-05,  
18 most applicants, I mean, yes, have another data point.  
19 So when using that, they could develop some kind of --

20 VICE CHAIRMAN SHACK: Again, that is very  
21 specific. How many data points did they take when  
22 they made those UT measurements? How many locations?

23 MS. TRAN: Eighty-seven? Do you know?

24 MR. ASHAR: Yes. Generally in response to  
25 87-05, a number of -- now I have to say licensees, not

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1 applicants -- licensees have taken that kind of  
2 approach that they will look at four points in four  
3 sectors --

4 VICE CHAIRMAN SHACK: Four quadrants.

5 MR. ASHAR: -- because they don't remove  
6 the sand. They just have the sand. It's not like  
7 Oyster Creek. So what they do is they chip out the  
8 concrete in certain areas and then take the  
9 measurements and in response to 87-05.

10 And the second reading they take is two  
11 years or so after. That gives them a closer rate at  
12 the same location. It isn't delicate science that,  
13 hey, something is going on. Then they do more work.

14 VICE CHAIRMAN SHACK: Now, again, from  
15 Monticello, they don't seem to have maintained those  
16 as access ports.

17 MEMBER SIEBER: No.

18 MR. ASHAR: No, they don't. I mean, they  
19 can get to it if they have to, but they don't maintain  
20 them because they --

21 MEMBER SIEBER: That becomes another  
22 pocket for corrosion --

23 MR. ASHAR: Yes, right. It becomes --

24 MEMBER SIEBER: -- because there is  
25 moisture inside the containment.

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1 MR. ASHAR: Right.

2 MEMBER SIEBER: In the sump is actually  
3 that floor there. The sump is built into the floor.  
4 And so every loose water, amount of water, ends up in  
5 that space where the drywell liner and the concrete  
6 meet.

7 So they have to fill it up. They have to  
8 do something. Otherwise you would have a pocket of  
9 water sitting there.

10 CHAIRMAN WALLIS: I am still a little  
11 puzzled. I would think that the corrosion rate is so  
12 low that it's within the uncertainty in the ultrasound  
13 measurements.

14 MR. ASHAR: If it is low, they will report  
15 as low.

16 MS. TRAN: At least we will have --

17 MEMBER SIEBER: Carbon steel water and --

18 CHAIRMAN WALLIS: There's no water there.

19 MR. GILLESPIE: As it happens with real  
20 applicants, we're looking at corrosion rates like 17,  
21 18 ml a year in some cases.

22 CHAIRMAN WALLIS: There is water there.

23 MR. GILLESPIE: Well, yes. And people are  
24 seeing some evidence of corrosion. In another case,  
25 Nine Mile case, they did these measurements. And then

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1 they have a high-corrosion area on mild carbon steel  
2 at the water line in the Torus.

3 And what they did was they took that rate  
4 as a conservative estimate, where they know water is,  
5 and applied it to their liner and say, "Okay. We've  
6 got 38 years to go here."

7 And so people actually have come up with  
8 ways given these points and other representative  
9 carbon steel areas within their area that they do  
10 measure because they're in harsher environments and  
11 applied that as a representation to this in order to  
12 show that they could make it past the renewal period  
13 or at least until the next measurement that they might  
14 commit to take.

15 And so so far each licensee that we have  
16 had an opportunity to both finish our review or  
17 interface with so far has actually been extremely  
18 consistent with this position. And so they have  
19 actually figured out how to do it.

20 And there is other carbon steel in the  
21 Torus, actually in a wet environment, which gives you  
22 a noticeable rate, as it happens, particularly where  
23 some of the liners have blistered and bubbled, which  
24 is a whole other issue, that they can apply to this.

25 It's a conservative application. You

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1 know, if it doesn't work, then they have to do  
2 something else to convince us that the rate is okay.

3 So when we talk the nebulous philosophy,  
4 it gets harder, but I think when you get to specific  
5 plant situations, pardon the pun, but it's concrete.  
6 And so they have kind of come up with ways to use the  
7 generic point, the generic letter issue points.

8 In fact, in Vermont Yankee's case, they  
9 actually had leakage and did extra measurements  
10 consistent with the ISP, which wasn't issued when they  
11 did this some years ago. And so they have preserved  
12 those extra points.

13 And so it just happens that these plants  
14 actually have this information sitting there. They  
15 just haven't used it in this application before. And  
16 this is clarifying. We expect you to use it in this  
17 application.

18 Go ahead, Linh.

19 MS. TRAN: I guess now where degradation  
20 has been identified in accessible area of the drywell,  
21 meaning in the interior area of the drywell, the  
22 applicant should provide an evaluation that would  
23 address the condition of the inaccessible area of a  
24 similar condition or find something in the interior  
25 area. They should have an evaluation for that.

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1 Now, to assure --

2 MEMBER APOSTOLAKIS: How does one do that?

3 MR. ASHAR: Let me. The actual, this is  
4 just what we have seen.

5 MEMBER APOSTOLAKIS: That's okay. You  
6 don't have to show it.

7 MR. ASHAR: Okay. This is the requirement  
8 we set in after when we endorsed IWE, IWL into  
9 50.55(a) in the rule, that if they find something in  
10 the accessible area, they ought to go and look in the  
11 surrounding inaccessible area to see if there is  
12 anything going on.

13 A lot of PWR licensees, for example, have  
14 found that at the junction of the steel liner of the  
15 concrete containment and the concrete floor, they have  
16 moisture barriers generally. And their moisture  
17 barrier gets damaged. The borated water many times go  
18 in. And it starts corroding the inside area. It  
19 shows up a little bit on the upper side.

20 So they would do examination and find out  
21 what is going on. And they find the moisture barrier  
22 could be the culprit. They have to change the  
23 culprit. They ought to go inside. They ought to take  
24 out the corrosion.

25 So that's the reason this problem has been

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1 in about the inaccessible. In accessible area you  
2 have corrosion. You would look into the joining  
3 inaccessible area to find every --

4 MEMBER APOSTOLAKIS: You will look into  
5 the inaccessible area. That helps make it accessible  
6 or not?

7 MR. ASHAR: No. If you see some rusting  
8 or something on the --

9 MEMBER APOSTOLAKIS: You can look at it.  
10 Why isn't it accessible?

11 MR. ASHAR: No, no. The whole area is  
12 that you see something in an accessible area. And  
13 they investigate as to what is going on underneath  
14 that particular area. The basic focus in the room was  
15 the PWR containments. That is where it was found in  
16 so many of them. And still we are finding it.

17 MEMBER ARMIJO: But it is possible you  
18 could have damage occurring in an inaccessible area  
19 and have nothing in the accessible.

20 MR. ASHAR: That's quite right.

21 MEMBER SIEBER: Possible.

22 MR. ASHAR: That is why this type of --

23 MEMBER ARMIJO: Very possible. I mean,  
24 it's --

25 MS. TRAN: That is why we use accessible

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1 area as the indication for the accessible area for the  
2 augmented inspection. They have to do visual in the  
3 surface. And then if the surface area is accessible  
4 only from one side and they have to protect the wall  
5 thing by using ultrasonic --

6 MEMBER ARMIJO: I don't worry about the  
7 accessible. I just worry about the inaccessible and  
8 having no way of knowing just by looking at the  
9 accessible area. It's not a good --

10 MR. ASHAR: That is where this ISG kicks  
11 in because this ISG is focused on inaccessible area.  
12 This is one of the pointers, that if there is  
13 something going on in the accessible area, which you  
14 can see right away, then there is something going on  
15 and you will look at it.

16 MEMBER ARMIJO: That is the easy part.

17 MR. ASHAR: The ISG concentration, focus  
18 of this ISG, is the inaccessible areas.

19 MEMBER APOSTOLAKIS: But how does one  
20 suspect?

21 CHAIRMAN WALLIS: Yes, that's right. How  
22 does one suspect?

23 MEMBER APOSTOLAKIS: How do you suspect?

24 MS. TRAN: You find water or leakage on  
25 your --

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1 MEMBER APOSTOLAKIS: That is getting back  
2 to what Dr. Armijo is saying. That's not our worry.  
3 What if you don't find water? You still make some  
4 problem in the inaccessible area. Is that correct?

5 MEMBER ARMIJO: Yes, you could.

6 MEMBER APOSTOLAKIS: So how does one  
7 suspect that something is going on in the inaccessible  
8 area?

9 MEMBER BONACA: No. She says water.

10 MS. TRAN: Water is one. If you find  
11 water in the drain lines, water in the drain line, in  
12 the --

13 MEMBER BONACA: For example, if the seals  
14 -- I guess you are focusing on the seals and on the  
15 bellows, right?

16 MR. ASHAR: Right.

17 MEMBER SIEBER: The only way you can get  
18 water into the inaccessible area is to have it flow  
19 through the accessible area. So if you make a  
20 measurement in the accessible area --

21 MEMBER APOSTOLAKIS: Okay. That is a  
22 different --

23 MEMBER SIEBER: -- that gives you some  
24 kind of justification to extrapolate to the area you  
25 get.

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1 MEMBER APOSTOLAKIS: But that doesn't help  
2 much because it could have run down --

3 VICE CHAIRMAN SHACK: The water runs down  
4 and collects at the --

5 MEMBER SIEBER: Right.

6 VICE CHAIRMAN SHACK: It doesn't stay on  
7 the side of the --

8 MEMBER BONACA: That is why the real focus  
9 is the last bullet. And that's what they attempted to  
10 do, you know, to put in the seals and the bellows in  
11 the scope of license renewal. And this has been kind  
12 of debated with the industry.

13 CHAIRMAN WALLIS: This is a very weak  
14 statement, "if moisture is suspected." That's a very  
15 subjective --

16 MS. TRAN: Or detected.

17 CHAIRMAN WALLIS: If you have a suspicious  
18 nature, you would suspect it all the time.

19 MR. ASHAR: Subsection IWE in its  
20 IWE-1240, there's a number of items. This is the  
21 abbreviated form. A number of places where this could  
22 occur is very vividly described in there, IWE-1240 in  
23 the ASME code. And that is what we are invoking, but  
24 we did not write everything that is written in the  
25 IWE-1240.

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1 MEMBER APOSTOLAKIS: Now, you are really  
2 including SSCs that are identified as source of  
3 moisture and scope, source of moisture?

4 MR. ASHAR: Yes. For example, cracking of  
5 bellows.

6 MEMBER SIEBER: The refueling seal.

7 MR. ASHAR: I explained to you earlier.

8 MEMBER APOSTOLAKIS: Okay. That's what --

9 MS. TRAN: The refueling seal is not.

10 MR. ASHAR: Refueling seal.

11 MS. TRAN: So they have to put that in the  
12 scope of license renewal.

13 MR. ASHAR: This is what we are --

14 MEMBER APOSTOLAKIS: Okay.

15 CHAIRMAN WALLIS: Why don't they just  
16 require that they check the bellows for cracks  
17 routinely?

18 MR. ASHAR: It is not very easy to get to  
19 it. They can do tests. That's what they do most --

20 MEMBER SIEBER: It not the only place it  
21 can leak.

22 MR. ASHAR: Yes. And I say --

23 MEMBER SIEBER: They can leak along the  
24 edge.

25 MR. ASHAR: Yes. And this is what we want

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1 to have them in the scope of license renewal, so they  
2 maintain them in a condition where it is not leaking.

3 MEMBER MAYNARD: Well, by "suspected"  
4 here, don't you really mean if there has been some  
5 previous evidence that moisture has been there? You  
6 know, I suspect. I have a hard time dealing with what  
7 I might suspect, but I can deal with whether I have  
8 had any indications or evidence.

9 MS. TRAN: Yes. This is "suspect" or  
10 "detected" through your drain lines.

11 CHAIRMAN WALLIS: Well, if moisture is  
12 detected, now, that makes sense.

13 MEMBER MAYNARD: Yes.

14 MS. TRAN: It should be "detected,"  
15 instead of "suspected."

16 VICE CHAIRMAN SHACK: So if moisture has  
17 been detected any time in the life of this plant up  
18 until license renewal included? Is that what it says?

19 MEMBER APOSTOLAKIS: It is not really  
20 detected. Go ahead. You answered my question.

21 CHAIRMAN WALLIS: Well, just take out the  
22 "if" clause and say, "include."

23 VICE CHAIRMAN SHACK: Yes. Why not just  
24 include them?

25 MEMBER APOSTOLAKIS: I think "suspected"

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1 is broader because would that include a situation  
2 where you have seen moisture or water in a similar  
3 facility and you suspect it may happen in yours, even  
4 though you hadn't seen it? "Suspected" is broader.

5 MEMBER MAYNARD: Well, yes, but I think  
6 from a regulatory standpoint and from dealing with  
7 licensees, I think you need a little bit better  
8 definition rather than it just being somebody's  
9 opinion sitting there saying, "Well, I suspect there  
10 might be something there."

11 CHAIRMAN WALLIS: Suspected by whom?  
12 Inspector or is it --

13 MEMBER MAYNARD: Well, I like the  
14 "detected" or --

15 MS. TRAN: Detected. I think --

16 MEMBER BONACA: We had a discussion  
17 yesterday at Monticello that shows how difficult the  
18 issue is. I mean, we rely very much on subjective  
19 judgments and say, "Well, we don't think we ever had  
20 water."

21 CHAIRMAN WALLIS: You could simply say  
22 that "The ACRS suspects that there may always be water  
23 there. Therefore."

24 MEMBER APOSTOLAKIS: You guys must have  
25 had a hell of a meeting yesterday.

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1 VICE CHAIRMAN SHACK: In Monticello's  
2 case, they see no evidence of corrosion in '87, which  
3 was a fairly substantial operating period for them.

4 MEMBER APOSTOLAKIS: That's right.

5 MS. TRAN: Identified.

6 MEMBER ARMIJO: If they have good records,  
7 they have a good sound --

8 VICE CHAIRMAN SHACK: One data point.

9 MR. ASHAR: We have to draw things --

10 MEMBER ARMIJO: They don't have to do it.

11 MS. TRAN: So just to get back on --

12 CHAIRMAN WALLIS: You really fixed this  
13 up.

14 VICE CHAIRMAN SHACK: Why not just put  
15 these seals in scope and be done with it?

16 MR. ASHAR: This is what we tried to do  
17 earlier. And there is so much resistance from a  
18 number of applicants. I mean, I had to go to three or  
19 four RAIs over and above a lot of teleconferences to  
20 convince them to put this in the scope of license  
21 renewal. And so many people denied.

22 CHAIRMAN WALLIS: So now you have to  
23 convince them to suspect something?

24 MR. ASHAR: No. Now, with this ISG, if  
25 they have suspected sites, areas, then --

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1 CHAIRMAN WALLIS: But they don't want to  
2 do it anyway. They'll never suspect anything.

3 MEMBER APOSTOLAKIS: No. Presumably there  
4 will be some guidance what suspicion means.

5 MR. ASHAR: There is a guidance.

6 MEMBER APOSTOLAKIS: Yes.

7 MR. ASHAR: There is.

8 CHAIRMAN WALLIS: There must be.

9 MEMBER APOSTOLAKIS: It just doesn't say  
10 it in bullets.

11 MS. TRAN: Yes.

12 MR. ASHAR: I was looking for IWE-1240  
13 here. I don't have one.

14 CHAIRMAN WALLIS: Okay.

15 MR. ASHAR: But that is where it is fully  
16 described as to -- this is what we are invoking here  
17 basically.

18 CHAIRMAN WALLIS: You want to say  
19 something, "if there are indications of moisture" or  
20 something like that.

21 MR. KUO: If I may, Part 54 rule in the  
22 rule language in the SOC discussed this, saying if a  
23 component is in an environment that could have aging  
24 effect, say in the operating experience, anywhere in  
25 the industry or your specific plant, that there is

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1 such a degradation mechanism, degradation mechanism  
2 that could cause an aging effect, then an aging  
3 management program should be provided. That's what  
4 the Part 54 rule requires.

5 In other words, if this is a possible  
6 aging effect from the operating experience, then that  
7 is suspected. You would use the word "suspect." That  
8 happened before. We should not talk about the  
9 hypothetical aging effect, but it is an aging effect  
10 that we have seen before.

11 VICE CHAIRMAN SHACK: Right. That is why  
12 I can't understand why you can't just put the seals in  
13 scope. I mean, it's not a hypothetical event.

14 MR. KUO: Like Hans said, some people  
15 don't want to include the seal in the scope.

16 CHAIRMAN WALLIS: There are often people  
17 who don't want to do things, but you can say, "Do it."

18 MEMBER BONACA: What you want and what you  
19 get are two different things.

20 MR. GILLESPIE: I think you will find as  
21 a result of this ISG, fundamentally seals are in  
22 scope. Remember, seals and the refueling stuff are  
23 not safety basically. And so what we're doing is  
24 because of the effect of non-safety components on a  
25 safety component, we're bringing them into scope. So

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1 it's a bit indirect.

2 And so it shouldn't be a surprise that  
3 utilities don't want extra requirement on things that  
4 don't have any requirements on them now.

5 MEMBER BONACA: But, you know, one thing  
6 that we are learning from this license renewal process  
7 as we converge, it seems to me that the central issues  
8 are becoming the inaccessible or buried components  
9 that you can't look at, that you cannot measure. And  
10 that's natural because, I mean, these plants are going  
11 beyond some original design in certain components of  
12 the -- and I think that it is important that we focus  
13 on these inaccessible components and ask our  
14 questions, you know, how long can this live and what  
15 is the source of the problem. And here -- anyway --

16 MS. TRAN: Hans wanted me to read the  
17 IWE-1241, the examination surfaces, "Surface area for  
18 the typical location," "Typical location of such areas  
19 of those exposed to stand-in water, repeated wetting  
20 and drying, persistent leakage, and those with  
21 geometries that permit water accumulations,  
22 condensation, and biologicals attack." I mean, it is  
23 in the -- it tells the applicant the area.

24 Now, let's say if moisture is detected as  
25 suspected or identified --

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1 (Laughter.)

2 MS. TRAN: Now, we will agree that they  
3 found water. Okay? So they should include the  
4 component, the source of it, in the scope of license  
5 renewal. In addition, we need to identify the surface  
6 area.

7 Next slide. By implementing and  
8 augmenting inspection for the period of extended  
9 operation in accordance with the ASME section 11,  
10 subsection IWE and also for the examination shall be  
11 in accordance with section 11, subsection IWE-2500.  
12 And I did go over that a little bit earlier.

13 That means that surface area accessible  
14 from both sides should be visually examined and  
15 surface area that is only accessible from one side  
16 should be examined for wall thinning and using sonic  
17 thickness measurement method.

18 Now, after all of that, after all of the  
19 augmented inspection, the applicant should demonstrate  
20 that either corrosion is not occurring by performing  
21 those examinations or analysis to do analysis on the  
22 result or that corrosion is progressing so slowly that  
23 the age-related degradation will not jeopardize the  
24 intended function of the drywell to the period of  
25 extended operation.

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1 VICE CHAIRMAN SHACK: Just how thick is  
2 this light bulb again?

3 MR. ASHAR: The light bulb? It varies.  
4 From the top, it is thinner, very thin, right around  
5 half-inch to three-quarter-inch. As you go down near  
6 the knuckle area between the sphere and the upper  
7 part, it is spherical area. It is close to about .7,  
8 .6 inches. Then it again goes down up to six inches.  
9 And then at the bottom area is about one to one and a  
10 half inches in between the sand pocket area --

11 VICE CHAIRMAN SHACK: No. But, I mean,  
12 it's 17 ml a year.

13 MR. ASHAR: Oh, yes.

14 VICE CHAIRMAN SHACK: You're going to chew  
15 that at a pretty good clip.

16 MEMBER BONACA: If you find a hole in the  
17 liner, I mean, would you suspect some moisture there?  
18 I mean, what is --

19 CHAIRMAN WALLIS: Even my chassis of my  
20 car, which is soaked in salt, doesn't corrode at 17 ml  
21 per year, does it? It's really bad conditions if  
22 you've got --

23 MR. GILLESPIE: Yes. That actually is the  
24 two worst points that a particular --

25 CHAIRMAN WALLIS: Yes, very bad --

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1 MR. GILLESPIE: -- that they reported to  
2 us. What it does do, though, is say there is  
3 operating history out there in this utility  
4 environment, that we cannot take for granted that it  
5 can't happen.

6 CHAIRMAN WALLIS: Right.

7 MR. GILLESPIE: And that's the reason for  
8 the ISG. We are not going to make the assumption  
9 because we have operating history that says it's not  
10 necessarily a valid assumption in all cases that it's  
11 going to go slow. There has been evidence of this  
12 going faster than people would have originally  
13 anticipated in the designs.

14 MEMBER BONACA: But in some cases where we  
15 have questioned the bellows, particularly the seals,  
16 if you're in seals, then the answer is always, well,  
17 we have good drainage. So you are in a quandary. I  
18 mean, what leads you --

19 MR. ASHAR: There are a number of things  
20 that tells us. The first thing, the drains are not  
21 clogged any time in the past. The second thing,  
22 visual examinations performed in the areas, it was  
23 shown there are no telltale signs of water for a  
24 number of inspections there performed. Then they had  
25 to show us at the bottom in the drain line there was

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1 no water coming out anywhere.

2 So there are so many things that they  
3 would tell us before they convince us that there is  
4 nothing going on.

5 MR. GILLESPIE: Mario, I would also say  
6 that I think this came up in Monticello's case  
7 yesterday, --

8 MR. ASHAR: Right.

9 MR. GILLESPIE: -- where they didn't take  
10 credit for it, but they actually had a primer sprayed  
11 on the outside of the inaccessible area. And other  
12 licensees have different applications of codings on it  
13 also.

14 And so it's not one thing.

15 MEMBER BONACA: Yes, I know, but --

16 MR. GILLESPIE: Aging management is  
17 accumulation of codings, time of exposure, amount of  
18 water.

19 MEMBER BONACA: And the spray on the  
20 surface was 65 or 40 years ago practically, 1965. So,  
21 you know, right. I understand.

22 MR. GILLESPIE: But the environment is not  
23 such that there is anything in there to actually cause  
24 the paint to peel off either. So there's no one issue  
25 here.

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1 MEMBER BONACA: Yes. I understand.

2 MR. GILLESPIE: It's different pieces to  
3 try to give you reasonable assurance.

4 MEMBER BONACA: In fact, yesterday at the  
5 end of the conversation, it was the lady who was  
6 performing the inspections felt confident with that.  
7 I'm sure that if you go physically and look at it and  
8 get information, you know, you can build a credible  
9 case that there is no concern with moisture. So I  
10 accepted that yesterday.

11 MEMBER ARMIJO: But a case has to be made  
12 --

13 MEMBER BONACA: Yes, it does.

14 MEMBER ARMIJO: -- with documented data,  
15 not just --

16 MEMBER BONACA: Right.

17 MEMBER MAYNARD: Is there something that  
18 is done periodically to ensure that these drains are  
19 really open, like particularly the sand point drains  
20 and stuff, that they're not plugged in some way?

21 MR. ASHAR: Now they are committing to  
22 those things. They have ensured those things, yes.

23 VICE CHAIRMAN SHACK: You'll find out when  
24 you have a leak.

25 MEMBER SIEBER: A sand pocket drain is a

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1 four-inch pipe. So they're hard to plug.

2 VICE CHAIRMAN SHACK: Yes.

3 MEMBER BONACA: I believe we have also  
4 some comments from the industry.

5 MS. TRAN: Right. Yes.

6 MEMBER BONACA: So shortly we'll get to  
7 those.

8 MS. TRAN: I am almost done. Now, if the  
9 intended function of the drywell cannot be met, the  
10 applicant can identify actions that will be taken as  
11 part of the aging management program to ensure that  
12 the integrity of the drywell would be maintained  
13 through the period of extended operation.

14 Last slide. Now, the drywell shell  
15 concern has already been addressed for the reactor's  
16 initial 40 years' licenses and relevant plants that  
17 have received a renewal license, as indicated in the  
18 left column there.

19 Now, the staff is in the process of  
20 reviewing the plants in the middle column. And the  
21 third column represented the remainder of the plants  
22 with the Mark I steel containment design.

23 Not all the plants in the third column,  
24 however, have announced their intention to renew their  
25 license, but the future review that's listed on the

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1 right side.

2 This concludes my presentation. So we can  
3 entertain any additional questions that you might  
4 have.

5 MEMBER BONACA: You don't have to request  
6 questions.

7 CHAIRMAN WALLIS: Ell, I suspect there  
8 might be some more questions.

9 (Laughter.)

10 MEMBER SIEBER: I don't know what they  
11 would be that we haven't already asked.

12 MEMBER BONACA: Any additional questions?

13 (No response.)

14 MEMBER BONACA: None. So we thank you for  
15 a very good presentation.

16 MS. TRAN: Thank you.

17 CHAIRMAN WALLIS: You have been here all  
18 day, Alex.

19 MR. MARRION: I know. Can I get one of  
20 those little name tag things? I'll just put it on.

21 (Laughter.)

22 MR. MARRION: Good afternoon. My name is  
23 Alex Marrion. I'm Senior Director of Engineering with  
24 NEI. And with me I have James Ross, who is the senior  
25 project manager with lead responsibility for license

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1 renewal. He's here to keep me out of trouble. He  
2 should have been here earlier.

3 I just want to make a couple of general  
4 comments. Based upon comments that the NRC made about  
5 the uniqueness of the specific plant designs, we feel  
6 that this is not really a generic issue, but it's  
7 appropriate to address it on a plant-specific basis in  
8 accordance with the uniqueness of the designs. And I  
9 think Frank Gillespie brought that up.

10 This is not a new issue. It's been  
11 addressed by the licensees in the past. There was a  
12 generic letter, 8705. And inspection requirements  
13 were incorporated into NRC regulations when NRC  
14 endorsed the ASME code subsection IWE as part of an  
15 update of 10 CFR 50.55(a).

16 Because that was already regulatory  
17 requirements, utilities were resisting the idea of  
18 imposing an additional regulatory requirement given  
19 that there wasn't sufficient evidence to indicate that  
20 the current requirement was not adequate if that makes  
21 sense.

22 The particular interim staff guidance is  
23 out for comment. Right now comments are due the 8th  
24 of June. We intend to submit comments on behalf of  
25 the industry.

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1           Most of the comments will be of a  
2 clarifying nature to make sure we understand the  
3 language, et cetera, which brings me to a more generic  
4 communication process issue. You know how I feel  
5 about generic communications based upon comments I  
6 made earlier.

7           The one thing that is not clear to us as  
8 an industry is why there is a need for an ISG process  
9 to begin with given that the NRC already has a  
10 well-established generic communication process that  
11 could be used as a vehicle for communicating staff  
12 guidance going forward.

13           So now we have generic communications.  
14 And we also have interim staff guidance, two separate  
15 processes that basically overlap. So we're going to  
16 continue making that point with every opportunity we  
17 have.

18           Lastly, I understand some question has  
19 been raised about the idea of continuing or the idea  
20 of imposing ultrasonic testing requirements. I want  
21 to make it clear that the current requirements that we  
22 currently have are for a graded approach to a visual  
23 examination.

24           And depending upon what you find, you do  
25 a more comprehensive examination, but the first step

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1 is a visual. And that's basic --

2 CHAIRMAN WALLIS: How do you visually  
3 inspect these inaccessible areas?

4 MR. MARRION: Well, as you heard from the  
5 staff, you do an examination of the inaccessible areas  
6 based upon what you find of the accessible areas if I  
7 have characterized it properly in what the staff was  
8 proposing.

9 And for the Mark I's, we intend to  
10 continue that process going forward. And we will be  
11 commenting accordingly on the ISG comments.

12 CHAIRMAN WALLIS: You have to be able to  
13 access some place which is relatively typical of the  
14 inaccessible places in order to do that.

15 MR. MARRION: Yes. I'm not familiar with  
16 the details of what that is, yes.

17 That's all I have, sir.

18 MEMBER ARMIJO: I just think that is  
19 fundamentally unsound because you have, really, a  
20 crevice condition in that sand pocket area. It's not  
21 at all represented by the accessible area.

22 And so looking at a safe location to make  
23 a judgment of a susceptible location seems to me a  
24 waste of time. I mean, if the accessible area is  
25 highly corroded, you can be sure that the inaccessible

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1 is in bad shape.

2 MR. MARRION: Right.

3 MEMBER ARMIJO: But the converse isn't  
4 true.

5 MEMBER APOSTOLAKIS: But didn't Jack say  
6 that for the water to get to the inaccessible area, it  
7 has to go through the accessible areas?

8 MEMBER ARMIJO: Yes, but it doesn't stay  
9 there.

10 VICE CHAIRMAN SHACK: It doesn't stay  
11 there.

12 MEMBER ARMIJO: It flows.

13 VICE CHAIRMAN SHACK: You have got a drain  
14 right at that thing. I mean, there is no way for  
15 water to really accumulate --

16 MEMBER APOSTOLAKIS: It is not  
17 accumulating.

18 VICE CHAIRMAN SHACK: -- in that  
19 accessible area.

20 CHAIRMAN WALLIS: But it gets to the sound  
21 --

22 MEMBER APOSTOLAKIS: But you are going to  
23 see some moisture or something.

24 MEMBER ARMIJO: You can make a case that  
25 if it's always been dry, that's your best case. You

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1 have good data.

2 MEMBER MAYNARD: I thought part of that,  
3 it would depend on what you include as a visual area  
4 for what you base -- if you're including the drains  
5 and if there is any moisture coming out of the sand  
6 drains or anything like that, well, that might be  
7 appropriate. But if you're saying that all you have  
8 to do is just visually look at the inside of the  
9 container there, that you don't have to do anything  
10 else.

11 But if you include as part of what you  
12 find visually results of drains and other things --

13 MR. MARRION: That is a comprehensive  
14 examination requirement that's in 50.55(a) right now.

15 Thank you. And I appreciate the time I  
16 spent with this illustrious body today.

17 (Laughter.)

18 MEMBER KRESS: We are honored to have you.

19 MEMBER BONACA: If there are no further  
20 questions, first of all, I want to thank the staff for  
21 their presentations and for the information. And then  
22 I'll turn the meeting back to you, Chairman.

23 CHAIRMAN WALLIS: Thank you very much.

24 We are finished with our formal  
25 presentations for the day.

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1 MEMBER KRESS: We don't have a letter on  
2 this particular issue?

3 MEMBER BONACA: No.

4 MEMBER KRESS: This was just a briefing?

5 CHAIRMAN WALLIS: Just a briefing. It was  
6 just a briefing.

7 MEMBER BONACA: There is no impact  
8 because, I mean, it was helpful because, again,  
9 yesterday we had a --

10 CHAIRMAN WALLIS: We don't need that --

11 MEMBER KRESS: Are we going to give some  
12 feedback now or anything on what we've heard or do you  
13 think the questions are sufficient?

14 VICE CHAIRMAN SHACK: The questions were  
15 sufficient.

16 CHAIRMAN WALLIS: Unless you have another  
17 point you want to make. Do you want to make some  
18 point?

19 MEMBER KRESS: Well, my point was that I  
20 just don't like this round-about way of doing things  
21 in the sense that I think there's a fatal flaw in  
22 trying to use the accessible areas to determine  
23 whether or not there is a problem in the inaccessible  
24 areas.

25 I would do what Bill Shack just said. Why

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1 not just include those sources of moisture within the  
2 scope?

3 VICE CHAIRMAN SHACK: Well, I think --

4 MEMBER KRESS: I know it has been resisted  
5 by the industry, but it doesn't seem like that big of  
6 a burden to me. I think that's the real solution.  
7 And that's what they're after, but they're trying to  
8 do it in a round-about way.

9 VICE CHAIRMAN SHACK: I also think a  
10 techie could come up with a way to measure those  
11 thicknesses.

12 MEMBER KRESS: Show me that way, and that  
13 may be okay. That's possible.

14 MEMBER SIEBER: Well, when you put the  
15 refueling seal in the scope, all you're doing is  
16 establishing an aging management program for that.  
17 That doesn't prevent leakage necessarily because there  
18 may be something other than the aging that causes the  
19 leaking.

20 MEMBER KRESS: Okay. Maybe. Maybe I am  
21 flawed.

22 MEMBER SIEBER: You could twist it, and  
23 now it leaks.

24 CHAIRMAN WALLIS: You should probably  
25 inspect a more susceptible area, which is a sand

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1 pocket.

2 MEMBER SIEBER: I think you have to deal  
3 with the --

4 MEMBER BONACA: In the past we left it to  
5 the --

6 MEMBER SIEBER: -- rather than deal with  
7 something that is removed from it.

8 MEMBER BONACA: In the past we left it to  
9 a licensee to have a choice. For example, in Browns  
10 Ferry, the staff was asking for inspection of the  
11 seals. They fought that. We left them open, either  
12 that or UT the liner in the vulnerable locations. And  
13 they chose to UT the liners.

14 The burden is inaccessibility because  
15 there is going to be that every ten years. And when  
16 they do the ISR, they are in containment. And they  
17 physically can then perform most of the utilities in  
18 those locations. So we left open those possibilities.

19 I take your point, and I think the  
20 Committee should decide. Should we have a comment on  
21 this or -- the intent wasn't one of providing a  
22 letter. This was an informational presentation, but  
23 --

24 CHAIRMAN WALLIS: I think the staff has  
25 heard our comments. It was a preliminary sort of

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1 thing. And that is probably good enough for now.

2 MR. GILLESPIE: We appreciate the comments  
3 because, as Mario said, underground cabling, piping,  
4 and this kind of large passive component are really  
5 becoming kind of the end point. Everything else we  
6 know how to deal with for the most part.

7 But I will say in this case -- and let me  
8 take Browns Ferry. You might say, well, why did  
9 Browns Ferry choose UT versus the seals. Browns Ferry  
10 actually had unidentified sources of leakage. And he  
11 said versus trying to identify every source of leakage  
12 because they didn't know where it was that their  
13 cheapest way out was actually to do the UT.

14 But they got the idea that we wanted to  
15 wait. And you had to assure us this thing was going  
16 to be okay relative to thickness.

17 VICE CHAIRMAN SHACK: That sand pocket is  
18 pretty big. I mean, you can have a fair amount of  
19 moisture in there that you're never going to see  
20 coming out of those drains. And, yet, you could have  
21 attack over a reasonable fraction of that.

22 MEMBER SIEBER: There are oodles of  
23 surface in there for the moisture to collect on.

24 MR. GILLESPIE: But, again, the locations  
25 of the drains are plant-specific. Some plants have

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1 seals, as Monticello had over it. Some places have a  
2 liner or coding on the other side of the surface.

3 VICE CHAIRMAN SHACK: Well, a bottom drain  
4 would give me a whole lot more comfort than that top  
5 drain would.

6 MR. GILLESPIE: Yes. The other thing is  
7 the sand is very compacted.

8 MEMBER KRESS: Have you ever tried to  
9 drain moisture out of the sand from the bottom? It  
10 doesn't come out.

11 MR. GILLESPIE: I don't want to pooh-pooh  
12 it, but the idea that this is a 130-degree area also  
13 --

14 VICE CHAIRMAN SHACK: You drive it out  
15 with --

16 MR. GILLESPIE: And so you're going to  
17 drive it out. And so you've actually got the occasion  
18 to get water in there about 20 days every 18 months or  
19 24 months depending on the fuel cycle someone is on  
20 and how long it's flooded. And that's why we've  
21 started to key into visual. You might say, visual  
22 leakage from someplace kicks you into needing to do a  
23 UT.

24 Now, what this inter-staff guidance  
25 position does do is says the identification of

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1 moisture, basically leakage, is equivalent to the  
2 visual recognition of accelerated corrosion on the  
3 inside. And that's an important distinction, which  
4 never existed before.

5 So for the inaccessible areas, we're using  
6 the indirect indication of seeing water as kind of an  
7 assumption that you have to do the same thing as if  
8 you saw accelerated corrosion on the inside. That  
9 gets us a measurement on an event basis.

10 And so someone who is sworn to keeping  
11 this thing dry, if they have an event during a  
12 refueling where they get leakage in there, now they're  
13 obligated to do something which is a bit more onerous  
14 and reestablish their rate.

15 It's not perfect. By the way, there are  
16 two inaccessible areas. We should be clear on that.  
17 There is the inaccessible area in the air gap. And  
18 then there's this inaccessible area that's layered on  
19 the bottom between the two concrete layers, which is  
20 really probably the most difficult area, but it was  
21 designed to last 40 years. It is totally lined with  
22 concrete. And then you've got this temperature  
23 gradient.

24 CHAIRMAN WALLIS: Is 40 years good enough  
25 with license renewal, though?

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1 MR. GILLESPIE: Now, it was originally  
2 designed for 40 years, but that was kind of an  
3 assignment. But now if you have no evidence of in  
4 leakage or water in there, I mean, again, it's  
5 indirect stuff. It's almost like a circumstantial  
6 case we're acting --

7 CHAIRMAN WALLIS: Concrete is not dry all  
8 the time.

9 MR. GILLESPIE: Concrete is porous  
10 material, and it is not dry all the time. And so then  
11 you could ask questions. A fair question in the aging  
12 management program is, what are you doing about  
13 groundwater? And do we have any evidence of  
14 groundwater?

15 We asked that from Nine Mile. And I think  
16 we're coming. I signed up the draft SE this morning.  
17 So I think next month we're probably coming on Nine  
18 Mile. They have actually got alarms on their drains  
19 if moisture is detected.

20 So every plant is doing some unique  
21 things.

22 CHAIRMAN WALLIS: Moisture can come out of  
23 the concrete. There is a lot of concrete. There is  
24 a late curing of the concrete which goes on for a long  
25 time. Then it can be damp. It doesn't have to be

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1 very damp --

2 MR. GILLESPIE: Right.

3 CHAIRMAN WALLIS: -- to produce some  
4 chemical reaction.

5 MR. GILLESPIE: What is the impact? This  
6 is what I don't know, is what is the impact of this  
7 temperature gradient.

8 CHAIRMAN WALLIS: You don't have oxygen.  
9 So that is probably what protects you.

10 MR. GILLESPIE: And so there is a number  
11 of things that -- we're doing our best, appreciate the  
12 Committee's comments, and more than happy. If anyone  
13 else has any better ideas, we would love to have them,  
14 but this ISG was an effort to send a benchmark for  
15 basically the best-performing plant on liners.

16 It has no moisture. What if you get  
17 moisture? How do you establish your rate? This is  
18 kind of putting out, in essence, that they now know we  
19 do expect a rate to even be established. We didn't  
20 have that in writing before.

21 CHAIRMAN WALLIS: We won't comment on it,  
22 and we hope it works out.

23 MR. GILLESPIE: Well, feel free to comment  
24 on it. We're happy to have comments. NEI is going to  
25 feel free to comment on it.

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1 CHAIRMAN WALLIS: We won't.

2 MEMBER BONACA: Certainly we will comment  
3 on individual applications.

4 MR. GILLESPIE: Yes. I do think this is  
5 middle ground we are wrestling with here because I do  
6 agree with Alex that the individual designs that we're  
7 applying this concept to are significantly different.  
8 In critical questions, like locations of drains, some  
9 are going to be more susceptible than others.

10 As I said, Browns Ferry said we have  
11 unidentified leakage. We know we have leakage. It's  
12 not a lot. UT is our answer. It's the only way that  
13 could give us positive confirmation.

14 CHAIRMAN WALLIS: Have they been having  
15 leakage on their reactor which has been shut down for  
16 all that period of time, unidentified leakage?

17 MR. GILLESPIE: Well, remember, we license  
18 units I, II, and III. The floor wasn't flooded on 1.  
19 So they haven't had any leakage on I for a long time.

20 CHAIRMAN WALLIS: They think they haven't.  
21 They could have an unidentified leakage.

22 MR. GILLESPIE: They had some unidentified  
23 leakage from refuelings in the other units, and they  
24 chose UT.

25 MEMBER SIEBER: They have them for fuel

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1 for --

2 MR. GILLESPIE: By the way, this is a very  
3 high-dose area, too. And so the question here isn't  
4 money.

5 MEMBER BONACA: Not only they. I mean --

6 MR. GILLESPIE: It's going to be dose.

7 MEMBER BONACA: Where the seals are, it's  
8 a very high red area.

9 MR. GILLESPIE: Yes.

10 MEMBER BONACA: Not down in the sand  
11 pocket.

12 MR. GILLESPIE: It depends on where you're  
13 at. You're directly under the vessel.

14 CHAIRMAN WALLIS: No one is going to go  
15 down there.

16 MR. GILLESPIE: My understanding from the  
17 licensees is from a radiological perspective, this is  
18 not an area you want to take lightly doing extra  
19 measurements over and above what you really need to  
20 confirm your --

21 CHAIRMAN WALLIS: BSBWR has hatches that  
22 you go in into the reactor pedestal area.

23 MEMBER BONACA: We were told by TVA that  
24 it is not a high red area because it is well below the  
25 --

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1                   MEMBER KRESS:  Graham, I was wondering if  
2                   the staff is considering a user need letter to  
3                   Research to try to develop a way to do this more  
4                   definitively, maybe strong on ultrasonics or  
5                   something.  Is there such a user need letter or any --

6                   VICE CHAIRMAN SHACK:  Well, there is  
7                   something from Oak Ridge now.

8                   MR. GILLESPIE:  Actually, there is a  
9                   letter report that just recently got put in ADAM from  
10                  Oak Ridge, from a project that Research sponsored, but  
11                  it is not commercially available yet.  And, as best I  
12                  understand it, it is a technique to calibrate for this  
13                  concrete steel concrete sandwich.

14                  I think, as I understand it, there are  
15                  three different alternative approaches to doing it.  
16                  And so the information is starting to be developed and  
17                  published.  But we're probably years away from actual  
18                  commercial application to go from the research bench  
19                  to the --

20                  MEMBER KRESS:  Yes, but you have got years  
21                  to go to do it in.  I mean, the corrosion rate is low  
22                  enough that --

23                  MR. GILLESPIE:  I am not disagreeing.  If  
24                  the Committee would like to -- we think we're actually  
25                  pretty close right now on a plant-by-plant basis.  But

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1 if the Committee would like to write a letter  
2 recommending a research project, it's okay. I don't  
3 mind. It's your Committee.

4 MEMBER SIEBER: The question is what do  
5 you want to cut out to pay for it.

6 MEMBER MAYNARD: I would like to just add  
7 on to Tom's previous comment just a little bit. It  
8 doesn't surprise me. And I would expect the industry  
9 to resist new requirements, new changes to things. I  
10 think it better to get the fight over, have it once,  
11 rather than a lot of times.

12 So, rather than dealing with a lot of  
13 things through staff guidance, generic letters, a lot  
14 of times it would be better if this is going to be a  
15 new expectation, new requirement, let's follow the  
16 process and make that -- you know, get the fight over  
17 with once, make it happen, rather than continually  
18 trying to go around these systems just generically.

19 MEMBER SIEBER: The requirement has always  
20 been there. And it stems from the code requirement.  
21 The question is, what do you do and how do you do it  
22 to give yourself a reasonable assurance that you're  
23 okay.

24 MR. GILLESPIE: The new aspect now is  
25 people having to articulate in an aging management

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1 program what they're going to do to ensure that their  
2 monitoring and measurement process for this liner will  
3 detect its approach to minimum wall thickness prior to  
4 it getting there.

5 I mean, that's really what plant license  
6 renewal is, to ensure that you have the additional  
7 monitoring programs in place that you will detect and  
8 correct prior to exceeding that minimum wall  
9 thickness.

10 The discussion of this ISG between us and  
11 the industry is evoked. I think it has now gotten us  
12 to a point where we have some actual cases under our  
13 belt that have now, you might say, set the standard  
14 for the next ones to come in.

15 And now we've got each plant evaluating  
16 itself against the plants we have already looked at  
17 and saying, "Am I like them? Am I different? If I'm  
18 different, then is it a positive difference or  
19 negative difference?"

20 And now we're starting to get those kind  
21 of aging management considerations into this piece of  
22 equipment, which we did not have, quite honestly,  
23 going in until we hit Browns Ferry.

24 The Committee wants -- Mario will remember  
25 this. I forget which BWR they were in. It was on the

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1 steam dryers. And I used the Committee. I quoted the  
2 Committee to the staff on the liner. And it was on  
3 the dryers.

4 And, Mario, I forget. You might have been  
5 the one who said it. You said it's large, it's  
6 passive, and you just wrote a generic letter saying  
7 it's safety. It wasn't in scope before that statement  
8 was made. It's now in scope. And, you know, the  
9 staff said it's large, it's passive, it has corrosion,  
10 and it's safety. And so now we're trying to take it  
11 on head on. I think with some success, you're seeing  
12 the applications getting it addressed at some level of  
13 credibility now.

14 MR. THADANI: Graham, I have one quick  
15 question.

16 Frank, you noted this is a high-dose area.  
17 This issue is one important in many ways, has I think  
18 rather minimal risk to public. How is that sort of  
19 balanced in terms of the actions called for and its  
20 relative importance?

21 MR. GILLESPIE: I think how we are trying  
22 to deal with that -- and we have got a meeting with  
23 one applicant day after tomorrow, Oyster Creek, on  
24 this, on our residual concerns after their RAIs. And,  
25 really, what we started talking about was the

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1       uncertainties involved in the decision.

2                   And so the question really is, how much  
3       should you pay for certainty in a decision? Because  
4       the significant measurement uncertainty and doing  
5       these UT exams, they're actually fairly coarse.

6                   There is uncertainty in primers and  
7       liners, which have exceeded, basically, the  
8       manufacturer-recommended lives of 10 to 15 years.  
9       Yet, they're still there. And they're still being  
10      inspected doing what they're doing.

11                   There is uncertainty in have you picked  
12      enough selected locations because we are looking for  
13      a general area degradation. We're not looking for  
14      just pitting.

15                   The Committee didn't mention it, but there  
16      are really two concerns. One is pressure retention  
17      and accident. And the other is buckling, the sheer  
18      collapsing of this thing under its own weight. And so  
19      you've got two reasons to inspect two different areas.

20                   And so I would suggest that in this ISG  
21      and what we're seeing from these utilities, we're  
22      actually accepting, you might say, a fair level of  
23      uncertainty in it to keep it rational.

24                   And so the safety consideration is in how  
25      much do we want to press people to make it more and

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1 more certain. And so that's really how we're  
2 factoring in the safety significance of it.

3 When I talk about dose and how many  
4 measurements need to be taken, we need reasonable  
5 assurance. And in many cases, there's not positive  
6 evidence on either side because this is a large  
7 passive thing that was put in there. It's expected to  
8 last forever fundamentally from the designer's point  
9 of view. We're confirming that assertion.

10 CHAIRMAN WALLIS: It probably will in most  
11 plants last.

12 MR. GILLESPIE: In most plants, I think it  
13 will. And so it's a confirmation. And so we're not  
14 designing the plant, which is very vigorous. We're  
15 confirming that the expected performance will be  
16 sustained. And we probably can be slightly less  
17 rigorous in the uncertainty we accept on that.

18 CHAIRMAN WALLIS: That is all the agency  
19 ever does. It doesn't design plants.

20 MR. GILLESPIE: Right.

21 CHAIRMAN WALLIS: It confirms performance.

22 MR. GILLESPIE: But you learn how much,  
23 what you're going to do in that confirmation.

24 MEMBER BONACA: Yes.

25 CHAIRMAN WALLIS: I think we may have gone

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1 over. We have gone over 15 minutes. I think it's  
2 about time we --

3 MEMBER BONACA: One last comment I had was  
4 that, you know, so many of the -- however the  
5 inspection processes we still depend on, for example,  
6 the visual inspection of this, we are still at the  
7 pace that really was conceived at the moment these  
8 plants are put in renewal. Okay? So every ten years  
9 they go in and look at it. Okay?

10 To me, you know, as these plants get older  
11 and older, these inaccessible areas, et cetera, you  
12 know, then maybe the frequency with which we're  
13 looking at it becomes more questionable because, you  
14 know, every ten years, a lot of things can happen.

15 CHAIRMAN WALLIS: Especially when you  
16 start to find things.

17 MR. GILLESPIE: We have occasions in  
18 several licensees where because they were sticking to  
19 a more extended inspection period, even when they had  
20 evidence of water, they did not consider evidence of  
21 water equivalent to accelerated corrosion visually.

22 So this ISG actually tries to take the  
23 principle you just espoused and says, "You can no  
24 longer in our expectation, staff's expectation, you  
25 can no longer ignore the presence of water. You have

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1 to now give us positive confirmation that the rate of  
2 degradation is still being minimized.

3 CHAIRMAN WALLIS: It is not boric acid.

4 MR. GILLESPIE: Yes, yes. At least we're  
5 dealing with a general moisture.

6 CHAIRMAN WALLIS: Right.

7 MR. GILLESPIE: And so this actually does  
8 go for that extended period to some incidents in which  
9 we actually have evidence from various licensees.  
10 They had evidence of water and basically did an  
11 engineering evaluation and did not obtain positive  
12 information if the thickness was okay.

13 MEMBER BONACA: What are you going to do  
14 when one of the already approved license renewals is  
15 going to come in for another license renewal?

16 MR. GILLESPIE: They have talked to us  
17 about that.

18 MEMBER BONACA: Well.

19 MR. GILLESPIE: I'm hoping to be retired  
20 by that point.

21 MEMBER BONACA: Anyway, I think we will  
22 see how this works.

23 MR. GILLESPIE: I started with the draft  
24 of the renewal rule in 1989 and have been doing this  
25 now for the last five years. At some point, someone

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1 else should do it.

2 MEMBER BONACA: All right.

3 MR. GILLESPIE: Thank you.

4 MEMBER BONACA: I give you back the  
5 meeting, Mr. Chairman.

6 CHAIRMAN WALLIS: We are ready to come off  
7 the record. Thank you very much for recording the  
8 meeting today, and we will take a break until a  
9 quarter to 5:00.

10 And when we come back, we will finish  
11 Mario's letter, which seems to be fairly  
12 straightforward. And then we will know where we are  
13 going with the other letter, hopefully know well  
14 enough that we can see our way to the end of it  
15 tomorrow.

16 (Whereupon, the foregoing matter was  
17 concluded at 4:34 p.m.)

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# Official Transcript of Proceedings

## NUCLEAR REGULATORY COMMISSION

Title: Advisory Committee on Reactor Safeguards  
533rd Meeting

Docket Number: (not applicable)

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS (ACRS)

533rd MEETING

+ + + + +

WEDNESDAY, MAY 31, 2006

+ + + + +

ROCKVILLE, MARYLAND

+ + + + +

The Subcommittee met in Room T2B1 at Two White Flint North, 11555 Rockville Pike, Rockville, Maryland, at 8:30 a.m., Graham B. Wallis, Subcommittee Chair, presiding.

MEMBERS PRESENT:

- GRAHAM B. WALLIS Chairman
- WILLIAM J. SHACK Vice Chairman
- GEORGE E. APOSTOLAKIS Member
- J. SAM ARMIJO Member
- MARIO V. BONACA Member
- RICHARD S. DENNING Member
- THOMAS S. KRESS Member
- OTTO L. MAYNARD Member
- JOHN D. SIEBER ACRS Member-At-Large
- JOHN LARKINS Designated Federal Official

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1       ACRS STAFF PRESENT:

2       HANS ASHAR                    NRR

3       DANIEL FRUMKIN                NRR

4       ALEX KLEIN                     NRR

5       THOMAS KOSHY                 EEEEB/DE/NRR

6       MICHAEL MAYFIELD             DE/NRR

7       GEORGE MORRIS                EEBE/DE/NRR

8       LINH TRANS                    NRR

9       GEORGE WILSON                NRR

10      ROBERT WOLFGANG             NRR

11      ROY WOODS                     RES

12

13      ALSO PRESENT:

14      HAROLD BARRETT             Duke Power Company

15      MIKE FALLON                 Constellation Energy

16      ALEX MARRION                NEI

17      DAVID MISKIEWICZ            Progress Energy

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AGENDA ITEMS

PAGE

Opening Remarks, Chairman Graham B. Wallis . . . 4

Draft Final Generic Letter, "Post-Fire  
Safe-Shutdown Circuit Analysis  
Spurious Actuations" . . . . . 5

Draft Final Generic Letter 2006-XX,  
"Inaccessible or Underground Cable  
Failures that Disable Accident  
Mitigation Systems" . . . . . 149

Interim Staff Guidance on Aging Management  
Program for Inaccessible Areas of Boiling  
Water Reactor (BWR) Mark I Containment  
Drywall Shell . . . . . 195

Adjournment

## P R O C E E D I N G S

(8:31 a.m.)

CHAIRMAN WALLIS: The meeting will now come to order.

This is the first day of the 533rd meeting of the Advisory Committee on Reactor Safeguards. During today's meeting, the Committee will consider the following:

Draft Final Generic Letter, Post-Fire Safe-Shutdown Circuit Analysis Spurious Actuations, Draft Final General Letter, Inaccessible or Underground Cable Failures that Disable Accident Mitigation Systems, Interim Staff Guidance on Aging Management Program for Inaccessible Areas of Boiling Water Reactor Mark I Containment Drywell Shell, and Preparation of ACRS reports.

This meeting is being conducted in accordance with the provisions of the Federal Advisory Committee Act. Dr. John T. Larkins is the Designated Federal Official for the initial portion of the meeting.

We have received no written comments from members of the public regarding today's sessions. We have received a request from Alex Marrion, NEI, for time to make oral statements regarding the Generic

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1 Letter on Post-Fire Safe-Shutdown Circuit Analysis and  
2 the Generic Letter on Inaccessible or Underground  
3 Cable Failures that Disable Accident Mitigation  
4 Systems.

5 A transcript of portions of the meeting is  
6 being kept and it is requested that the speakers use  
7 one of the microphones, identify themselves, and speak  
8 with sufficient clarity and volume so that they can be  
9 readily heard.

10 I will begin with some items of current  
11 interest. In the items handed out to you, I notice  
12 that there is a speech by Commissioner Yatzko at the  
13 beginning. And at the end, there is an interesting  
14 article on various matters which complicate PWR sump  
15 evaluations.

16 Now in the middle of the day, we are going  
17 to have ethics training which is why the lunch break  
18 is so long today. And the ethics training is  
19 scheduled for between 12:15 and 1:30 so you should be  
20 here at 12:15 and ready to be trained in ethics.

21 That is the end of my prepared remarks.  
22 And I'd like to proceed with the meeting. Call on  
23 Rich Denning to get us started on the first item.

24 MEMBER DENNING: Thank you. We will be  
25 hearing from the staff regarding the draft final

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1 generic letter 2006-XX, Post-Fire Safety-Shutdown  
2 Circuit Analysis Spurious Actuations. The Committee  
3 will hear presentations by and hold discussion with  
4 representatives of the staff.

5 Additionally, Mr. Alex Marrion with NEI,  
6 has requested ten minutes to share NEI's perspective  
7 after the staff's presentation.

8 The Committee had requested to review the  
9 generic letter regarding Post-Fire Safe-Shutdown  
10 Circuit Analysis Spurious Actuations after the public  
11 comment period. We did not have a prior subcommittee  
12 meeting on this letter which may have been a mistake.

13 I have serious reservations about the  
14 balance between regulatory burden and approved safety  
15 associated with this letter. The letter leaves open  
16 options for risk informing this process but they are  
17 not easy activities to perform. So we are anxious to  
18 hear what the staff has to say on this. And to have  
19 a healthy discussion, I believe.

20 We have a considerable period of time  
21 actually to do this, three hours. But I think that we  
22 will want to look into this letter very carefully  
23 before giving our blessing.

24 I think we are now ready to hear from  
25 staff. And I'll turn it over to Alex Klein of the

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1 Office of Nuclear Reactor Regulation.

2 MR. KLEIN: Thank you very much. My name  
3 is Alex Klein. You see on the cover slide here my  
4 branch chief's name, Sunil Weekakkody. He extends his  
5 regrets for not being able to attend today's meeting  
6 in that he had a prior commitment for jury duty today.  
7 With that, I'm acting in his place so I will give the  
8 opening presentation.

9 The purpose of today's meeting and the  
10 presentation to the Committee is to present the final  
11 draft of Generic Letter 2006-XX, Post-Fire Safe-  
12 Shutdown Circuit Analysis Spurious Actuations. We are  
13 also here to obtain ACRS endorsement to issue the  
14 proposed generic letter.

15 I'd like to introduce the two primary  
16 staff members who will present today for NRR. To my  
17 left is Robert Wolfgang who is the primary author of  
18 the generic letter. And to my right is Daniel  
19 Frumkin, fire protection engineer, from the Office of  
20 NRR, who will speak to you about some of the NEI and  
21 EPRI fire testing.

22 We also have in the audience with us  
23 supporting staff members from NRR who were also  
24 instrumental in the development of this generic  
25 letter.

1           As an overview, I wanted to advise the  
2           Committee that there is a lot of history leading up to  
3           this generic letter. And you will hear some of this  
4           today. We did a bounding analysis, full of risk. We  
5           also did a regulatory analysis of the generic letter.  
6           But at this time, those slides are not in our  
7           presentation. But we are certainly prepared to  
8           discuss those aspects.

9           MEMBER DENNING: We absolutely would like  
10          to see those slides.

11          MR. KLEIN: Very good.

12          So the probability of spurious actuations  
13          due to fires will be presented by Dan Frumkin after I  
14          speak. And then after Dan speaks, we will receive a  
15          summary of the objectives of the generic letter by Bob  
16          Wolfgang.

17          Again, based upon the long history of this  
18          generic letter and so forth, there has been differing  
19          views between the industry and the NRC on the  
20          credibility of multiple spurious actuations. You will  
21          hear about the NEI/EPRI cable fire test results from  
22          Dan Frumkin, as I indicated.

23          I also wanted to indicate to the Committee  
24          that we are continuing with our inspections using  
25          risk-informed aspects. For example, RIS 2004-03,

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1 certainly one of the goals of issuing this generic  
2 letter is to reestablish compliance with the  
3 regulations.

4 That concludes my introductory remarks.  
5 And I'll hand over the presentation to Dan Frumkin.

6 CHAIRMAN WALLIS: When you present, could  
7 you make it clear to me just what it is you are asking  
8 industry to do because I had a lot of trouble figuring  
9 that out. There is a lot of sort of rather vague  
10 requirements it seems to me. And perhaps you can in  
11 your presentation make it clear just what it is they  
12 have to do.

13 MR. KLEIN: Yes.

14 MR. FRUMKIN: Good morning. My name is  
15 Dan Frumkin from the Office of NRR. I work for Sunil.  
16 And today I'm going to present some of the background  
17 from the NEI/EPRI testing that is discussed in the  
18 generic letter.

19 I see some new faces around the ACRS table  
20 so I'm going to pass around some tables from some  
21 testing that occurred. At the end of the cables that  
22 are fused together, you will be able to see two  
23 failure modes or examples of two failure modes. One  
24 is an inter-cable which is two cables -- or actually  
25 one is an intra-cable, which we use these terms intra

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1 within a single cable and inter between two separate  
2 cables. And this provides an example of both.

3 The highlighted portions within a cable  
4 are very close together that have failed together.  
5 And then we also have intruding cable that has  
6 penetrated the outer jacket and apparently the inner  
7 cable protection and come at least into very close  
8 contact which you can see.

9 We will talk also about the different  
10 types of cable. This is a thermal plastic cable,  
11 which is the more vulnerable cable, but as you can  
12 see, that it is subject to both failures from internal  
13 and external cables when put under the suitable heat  
14 or fire exposure.

15 So I'll be providing some background on  
16 the testing that provided the insight into the failure  
17 likelihoods, the objectives of that testing, some  
18 details of the testing, some of the test results, and  
19 a few conclusions based on the testing.

20 And then Mr. Wolfgang will be talking  
21 about the generic letter more specifically.

22 The NEI/EPRI testing was intended to  
23 address fire-induced circuit failure issues of concern  
24 to the NRC staff, principally the potential for  
25 spurious operations of equipment.

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1           This was intended to basically bring to  
2 close the question that the staff kept on bringing up  
3 that Browns Ferry had these and the industry said that  
4 well, it is very unlikely to occur. So this was  
5 intended to bring that to a close.

6           NRC witnessed the testing and also did  
7 some insulation resistant testing using Sandia  
8 National Laboratory resources.

9           And there are four documents that either  
10 in whole or in part document the results of some of  
11 the testing. The characterization of fire-induced  
12 circuit failures results is the big report from EPRI.

13           The circuit analysis failure modes and  
14 likelihood analysis is the Sandia Report of their  
15 insulation resistant testing.

16           These results were pulled into the NUREG  
17 6850, which is the fire protection re-quantification  
18 or the fire PRA methodology for nuclear power  
19 facilities. This is the state-of-the-art document  
20 that Research has developed to -- it is a handbook on  
21 how to do fire PRA.

22           And then there was the spurious actuation  
23 expert elicitation which was experts reviewing the  
24 testing and coming up with results.

25           The objectives, as I said, was to research

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1 the characteristics of fire-induced circuit failures  
2 to better understand these plants' responses to cable  
3 failures. And, as I said, the NRC also was involved  
4 in the testing and reviewed -- witnessed the testing  
5 and did their own insulation resistant testing.

6 So the details of the test, there were 18  
7 fire tests that were conducted between January 9th,  
8 2001 and June 1st, 2001 at the Omega Point  
9 Laboratories in San Antonio. And the three types of  
10 fire exposures were tested during the test. The hot  
11 gas layer region which is up at the ceiling level, the  
12 fire creates a buoyant plume and it fills the  
13 enclosure from the top down. And that is the hot gas  
14 layer.

15 Then below -- between the fire -- the  
16 actual fire and the hot gas layer is what we call the  
17 plume region where there is no flaming but that is a  
18 very hot part of the -- that is the hottest part of  
19 the smoke region of the fire.

20 And they also tested a radiant exposure  
21 where you get close to the fire itself or sometimes  
22 worst case could be up next to the plume region  
23 depending on emissivity of the smoke and the radiant  
24 energy coming off. If it is a clean burning flame, it  
25 may not have a high radiant energy but the smoke may

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1 be higher. So -- but they just used, I believe, a  
2 fixed radiant number but that is a little discussion  
3 of the radiant energy.

4 One thing that they didn't do that I will  
5 add is they did not put cables in the flaming region.  
6 That is why I have this highlighted. We, the staff,  
7 hear a lot from the licensees about how long it takes  
8 to have these cables fail. And that there is plenty  
9 of time in all situations for mitigation.

10 And based on the testing, yes, in a lot of  
11 the testing there was a lot of time before there was  
12 failure in, you know, 30, 40 minutes for some of the  
13 tests. But none of the tests tested this flaming  
14 region.

15 So this leaves the staff a very strong  
16 question of how fast -- well, first we don't know what  
17 failures will occur in that region. They could occur.  
18 They may not occur. We don't have the information.

19 It is very clear that if they do occur,  
20 they will occur much more quickly. The temperatures  
21 are over, you know, much -- a thousand degrees hotter  
22 in the flaming region. And there is also an ignition  
23 source. So it is a very different phenomenon. And  
24 cables could be exposed to a flaming region in the  
25 plant.

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1           So this test is not a complete picture of  
2           -- or let me just say that the timing factors that  
3           came out of the testing that was done are not a  
4           complete picture of the possible scenarios that could  
5           occur.

6           MEMBER APOSTOLAKIS: It appears that you  
7           were participating in the conduct of these tests. Did  
8           you express these concerns to EPRI when they were  
9           designing the tests?

10          MR. FRUMKIN: Well, I wasn't specifically  
11          involved in that. I don't believe that the test was  
12          intended to develop timing. And as such, it wouldn't  
13          have been an issue. The licensees or the industry has  
14          brought this timing issue and perhaps inappropriately  
15          based on the testing.

16          It is useful to heat this cable slowly  
17          because then the hot shorts would probably exist for  
18          a longer period of time. But whether this -- but my  
19          only point is that I don't believe that this testing  
20          provides a basis to say that hot shorts -- this test  
21          I don't think was intended or can provide a basis for  
22          timing. But I believe it is being applied or some  
23          intend to use it to show that there is a timing issue.

24          MEMBER APOSTOLAKIS: I would be such an  
25          obvious thing to do. I mean there must be a reason

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1 why they didn't do it. Do you know that? Or should  
2 we ask Mr. Marrion when he comes?

3 MR. FRUMKIN: Why they didn't do the  
4 flaming region? Yes, that is a fair question. But I  
5 believe the answer -- like I said, I do think that  
6 that was not -- if there hadn't been any failures  
7 outside of flaming region, I think there would have  
8 been a strong feeling that failures in the flaming  
9 region would have been maybe less likely. But it is  
10 a fair question.

11 MEMBER APOSTOLAKIS: Okay.

12 CHAIRMAN WALLIS: Does the material from  
13 which the insulation is made, does that actually burn  
14 at some temperature?

15 MR. FRUMKIN: Yes.

16 CHAIRMAN WALLIS: But if you stuck it in  
17 a flame, you would expect the insulation itself to  
18 catch fire.

19 MR. FRUMKIN: Yes. The ASTM -- or, I'm  
20 sorry, the IEEE 383 fire test that has been the  
21 standard fire test is actually a burning test. And it  
22 ignites the flames from the bottom in a vertical cable  
23 tray. And all the cables do catch on fire when  
24 exposed to flame. But some of them propagate more or  
25 less slowly.

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1           There are some specialized cables that  
2 don't catch on fire but those were not tested. Those  
3 aren't what we are talking about here.

4           So the results of the tests showed with  
5 some confidence that failures within multi-conductor  
6 cables are likely and when they do occur, they occur  
7 in multiple conductors within the same multiple  
8 conductor cable. So as you can see from that cable  
9 bundle, there may actually be more than one cable  
10 conductor within the cable further down the jacket  
11 that you can't see.

12           And then the way they are spiraled  
13 together in there so that various cables could come in  
14 contact with other cables within the same cable.  
15 Various conductors could come into contact with other  
16 conductors within the same cable.

17           In addition, multiple devices were shown  
18 -- the spurious actuation data showed that a single  
19 hot short within a multi-conductor cable usually  
20 effected actuation devices simultaneously. If there  
21 were two devices -- I believe the way they set this  
22 test up is they wanted a very practical approach.

23           So they actually put -- rather than doing  
24 similar to the Sandia testing where they used an  
25 insulation-resistance device, they used actual plant

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1 equipment, which they just plugged it in as they would  
2 in the plant and if it would actuate or not actuate.  
3 So it was a real pragmatic thing and they did actuate.  
4 And as the testing showed, some actuated  
5 simultaneously.

6 MEMBER MAYNARD: Did they also measure how  
7 long the signal stayed there? Or how long it  
8 actuated?

9 MR. FRUMKIN: Yes. And most of the hot  
10 shorts were of a short duration. And some were in the  
11 order of minutes, I believe.

12 This is a table of results of the best  
13 estimates given cable damage of a spurious actuation  
14 probability. And the purpose of this table is not to  
15 -- the purpose of this table is just to show that the  
16 NRC and the industry -- or at least the results from  
17 the EPRI report which was developed by industry, are  
18 very consistent.

19 The staff and the risk people in industry  
20 really are on the same page with the likelihood of  
21 spurious actuations. There are some factors of two  
22 here, differences, but in probabilistic and  
23 likelihoods, in that world it is a small difference.

24 CHAIRMAN WALLIS: This is strange to me.  
25 It must depend on the extent of the damage. I mean if

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1 you just burn a cable for a short time, nothing  
2 happens. If you burn it for long enough, you are  
3 going to get shorts. So you can't just have a  
4 probability. It is going to depend on the extent of  
5 the damage to the cable.

6 MR. FRUMKIN: Yes. In all these, cables  
7 were exposed to damage. So this is given that these  
8 cables were damaged.

9 CHAIRMAN WALLIS: But to what extent?

10 MEMBER APOSTOLAKIS: It is a critical  
11 probability. I mean -- or, as you said earlier --

12 PARTICIPANT: At some point the  
13 probability is one, right?

14 MEMBER APOSTOLAKIS: I mean there is a 0.6  
15 conditional probability that you will have a spurious  
16 actuation. This is conditional on the probability  
17 that the cable is damaged.

18 MR. FRUMKIN: Correct.

19 MEMBER APOSTOLAKIS: And what is that?

20 MR. FRUMKIN: That depends on the  
21 scenario. For example, if a cable is a foot above a  
22 piece of switch gear or let's say -- and this is not  
23 an unlikely situation -- a foot above 20 or 30 feet of  
24 switchgear. It runs across the cable tray, across the  
25 top of a number of pieces of switchgear, what is the

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1 probability?

2 Well, that could be calculated typically,  
3 I think, a single piece of switchgear is five times E  
4 to the minus five. Or, you know, in that range. But  
5 then it certainly would be damaged if there was even  
6 a small fire in that piece of switchgear.

7 So there is -- you could have cable -- and  
8 then that same cable does go through different areas  
9 where it could be exposed to different other fires.  
10 A single cable could go through three, four, five  
11 different areas and be exposed to a dozen different  
12 fire scenarios.

13 MEMBER DENNING: I think we have to  
14 recognize the context within which this is done,  
15 George. And I think it is important when we try to  
16 get into the question of risk informing this and that  
17 is basically we are doing a deterministic safe  
18 shutdown analysis in which you assume there is a fire  
19 in a zone -- in a fire area. And it can burn there  
20 for three hours. You know even though there are other  
21 mitigating things that would clear that, we assume it  
22 can burn for three hours.

23 So then the question is well, with this  
24 massive potential exposure, then you have got a cable  
25 running through there. What's the potential that it

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1 could then be heated up to a point at which you get  
2 this kind of interaction? You know it doesn't get at  
3 all into the questions of you have a fire in a room,  
4 what is the possibility that any cables are exposed,  
5 you know, before it is controlled.

6 MEMBER APOSTOLAKIS: But if we are doing  
7 a deterministic analysis, why are we calculated  
8 spurious actuation probabilities?

9 MEMBER DENNING: Well, let me give my view  
10 but I'd certainly like to hear your view, and that is  
11 that the question is not so much whether you can have  
12 spurious actuations but how many can you have? How  
13 many combinations of things can you deal with?

14 The industry has always agreed to looking  
15 at a spurious actuation on a one-at-a-time basis, you  
16 know. And so I think that what the staff is trying to  
17 do is to give the feeling that -- or their impression  
18 that this isn't the really rare event -- the extremely  
19 rare event that actually would have some kind of  
20 spurious actuation occurring.

21 And then I think by implication then maybe  
22 there is the potential for multiple spurious  
23 activations.

24 MEMBER APOSTOLAKIS: Well, the second  
25 bullet of the previous slide, I guess, is then the

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1 key, right? Is that what -- of devices?

2 MEMBER DENNING: Well, I would be curious.  
3 What is your -- if you were answering that question,  
4 how would you have answered George's question? Why  
5 are we looking at probabilities here now?

6 MR. FRUMKIN: Well, okay, maybe this slide  
7 was poorly planned. But the point of the slide is  
8 twofold. One is to say that with regard to  
9 probabilities, the staff and the industry people who  
10 do this work are on the same page.

11 And the second reason, I guess, is to show  
12 that these probabilities are very high in  
13 probabilistic space, that some of them are close --  
14 you know, 0.6, and then if you have a 0.6 scenario and  
15 you have two 0.6 scenarios, you've got a 0.36  
16 scenario. So that even multiple can be a fairly high  
17 probable.

18 MEMBER DENNING: Now help us though -- you  
19 can't say that without giving some conditionality of  
20 --

21 MR. FRUMKIN: Right.

22 MEMBER DENNING: -- 0.6 conditions on  
23 what?

24 MR. FRUMKIN: Cable damage.

25 MEMBER DENNING: Cable damage.

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1                   MEMBER ARMIJO: I have a problem with  
2 cable damage. Is this severe? Moderate? I have no  
3 feeling of -- I can see where all the insulation is  
4 burnt to a crisp and I would call that severe.  
5 Wouldn't these probabilities all be one?

6                   MR. FRUMKIN: No. Well, okay, so what  
7 this is talking about is the spurious actuation  
8 probability, not shorting situation. This is the  
9 likelihood of a hot short occurring within a cable  
10 without that cable shorting to its conduit or cable  
11 tray because generally once the hot conductors fail to  
12 the conduit or cable tray or the nearest ground, then  
13 they would certainly -- that would clear the spurious  
14 actuation.

15                  MEMBER MAYNARD: Okay. But I think there  
16 is a high probability if you make all the assumptions  
17 to get to this point. But you also have to factor in  
18 the probability of actually having a fire, for the  
19 fire going that long, for the operators not taking any  
20 action. There are a lot of other things getting up to  
21 that point that when you put it all in context --

22                  MEMBER APOSTOLAKIS: That is why I'm  
23 confused. We are either doing deterministic analysis  
24 or we are doing risk analysis. If we do risk  
25 analysis, then, of course, we have to do all this. If

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1 we do what Rich said, then it seems to me they are  
2 gone.

3 I mean you have three hours. Everybody is  
4 burning, right? I think as I recall from the early  
5 studies on this the real question is whether you will  
6 have a short -- a hot short first before an open  
7 circuit.

8 MR. FRUMKIN: Right. Before the short  
9 ground.

10 MEMBER APOSTOLAKIS: That is the critical  
11 thing.

12 MR. FRUMKIN: Yes.

13 MEMBER APOSTOLAKIS: And this is not  
14 answering that, is it?

15 MR. FRUMKIN: Yes, it is.

16 MEMBER APOSTOLAKIS: It is?

17 MR. FRUMKIN: This is the likelihood of  
18 that spurious actuation probability, not a short to  
19 ground.

20 MEMBER APOSTOLAKIS: Okay.

21 CHAIRMAN WALLIS: This is one spurious  
22 actuation.

23 MR. FRUMKIN: This is a single.

24 CHAIRMAN WALLIS: A single one although  
25 there are multiple wires in the cable?

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1 MR. FRUMKIN: Right. Well, this is a  
2 spurious actuation getting cable to damage within a  
3 cable or between -- there is an inter-cable factors  
4 here -- between two cables. So the point -- let's  
5 just say the 0.6 here is for within a single thermoset  
6 cable, the 0.2 or the 0.4, as the 6850 has it, is  
7 between -- or generally it is 0.3 is what has been  
8 used a lot -- is between two separate thermoset cables  
9 within the same tray.

10 And what the previous slide was trying to  
11 say is that within a single thermoset -- within a  
12 single multi-conductor cable, that more than one of  
13 the conductors are going to fail together with an 80  
14 percent likelihood. So it almost for sure that if  
15 let's say you have one hot conductor and four control  
16 conductors that could actuate four different pieces of  
17 equipment, that hot conductor will come into contact  
18 probably with all of them with the same likelihood,  
19 with this same 0.6.

20 CHAIRMAN WALLIS: Oh, with the same  
21 likelihood?

22 MR. FRUMKIN: Yes. It's not a 0.6 times  
23 0.6 times 0.6 in the same cable. Within that cable it  
24 is 0.6 times 0.8, if you will.

25 CHAIRMAN WALLIS: Okay.

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1 MR. FRUMKIN: So it is still -- it is  
2 almost 0.6.

3 MEMBER DENNING: Why are the inter-cable  
4 probabilities the same for thermal plastic and  
5 thermoset?

6 MR. FRUMKIN: Because -- oh, you mean this  
7 and this?

8 MEMBER DENNING: Yes.

9 MR. FRUMKIN: Inter-cable -- yes, I'm not  
10 -- that's just a -- well, intra-cable is very likely  
11 --

12 MEMBER DENNING: Intra-cable, I understand  
13 that.

14 MR. FRUMKIN: Yes, I don't -- I don't have  
15 --

16 CHAIRMAN WALLIS: What is the question,  
17 Rich?

18 MEMBER DENNING: It's thermoset is less  
19 likely -- one would think thermoset would be less  
20 likely to have inter-cable and perhaps they are the  
21 same here because there just haven't been any  
22 experiments done on a thermoset.

23 MR. FRUMKIN: I think that is it because  
24 you can see that that is one of the big differences,  
25 a factor of two here, and again the same factor of two

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1 for intra-cable -- inter-cable -- but yes, we're -- as  
2 Roy Woods is here, and we're doing more testing on  
3 this. But this is currently the state-of-the-art data  
4 on this.

5 And I can't explain the -- it's just that  
6 is what the data showed from the limited 18 tests.

7 CHAIRMAN WALLIS: Now we are talking about  
8 whether you are doing probabilistic or deterministic  
9 analysis. When we get to the generic letter, there  
10 are strange terms such as saying the licensee must  
11 assume the possibility of simultaneous multiple  
12 spurious actuation -- well that tells me nothing.

13 I'm assuming the possibility -- it says  
14 nothing about whether it is likely to be one or 0.6 or  
15 whatever.

16 MEMBER DENNING: What they are saying is  
17 one.

18 CHAIRMAN WALLIS: What does it mean?

19 MEMBER DENNING: It means one.

20 CHAIRMAN WALLIS: So possibility means a  
21 probability of one?

22 MEMBER DENNING: That's -- yes.

23 CHAIRMAN WALLIS: That wasn't clear to me  
24 at all. Okay.

25 MEMBER APOSTOLAKIS: We will come to the

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1 letter, I guess.

2 MEMBER DENNING: Yes. Continue.

3 MR. FRUMKIN: These are just some notes on  
4 the previous slide that some of the plants that use  
5 the CPTs, which are the control power transformers,  
6 that reduces the likelihood of spurious actuations.

7 MEMBER APOSTOLAKIS: All of these  
8 probabilities, of course, mean nothing now.

9 MR. FRUMKIN: Right, yes.

10 MEMBER APOSTOLAKIS: They are one.

11 MR. FRUMKIN: Okay. Well --

12 MEMBER DENNING: But we are going to get  
13 to risk informing at some point here.

14 MR. FRUMKIN: Absolutely. Right. So  
15 those were just notes on the previous slide which was  
16 unfortunately put in here.

17 In conclusion, a review of the test data  
18 readily illustrates that hot shorts often involve more  
19 than one conductor. And that concurrent hot shorts  
20 within a cable are probable and should be considered  
21 during circuit analysis.

22 That's the end of this presentation. And  
23 the point of this is just to lay the groundwork that  
24 simultaneous spurious actuations and simultaneous  
25 multiple spurious actuations have been shown by

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1 testing, by industry testing, to occur.

2 MEMBER DENNING: Now there is more testing  
3 that is in progress. It is your feeling that that  
4 testing could then -- will it be done within a time  
5 period where we add value to the licensee when the  
6 licensee is basically responding the generic letter?

7 MR. FRUMKIN: Yes, that testing is planned  
8 to be done by the end of the year. And that pool of  
9 data will be available -- certainly for risk-informed  
10 evaluations for the licensees to use. But the experts  
11 doing the testing don't believe that there is going to  
12 be -- they believe these numbers are going to be  
13 honed.

14 They believe that there are going to be  
15 more cable combinations tested here than in the 18  
16 EPRI tests -- EPRI/NEI tests. But they don't believe  
17 that for the information that was on that table are  
18 going to be changed by an order of magnitude. It's  
19 maybe a 50 percent change or something of that nature.

20 MEMBER DENNING: If we have time later on,  
21 could we have a short presentation by someone about  
22 what is still to happen? And what different  
23 configurations basically have been untested at this  
24 point that will be tested?

25 MR. FRUMKIN: Well, Roy Woods is sitting

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1 behind you. And I'm not sure if he is prepared to  
2 talk about this testing.

3 MEMBER DENNING: Let me say I'm not asking  
4 for you to do it right now. But do you think you  
5 could do it later?

6 MR. WOODS: Sure. Roy Woods, RES. Yes,  
7 certainly we can make a presentation to you whenever  
8 you want on the testing. The plans are well made. We  
9 are about to start within days or a week at most. It  
10 is actually about to happen.

11 MEMBER DENNING: Okay. Well, let's go  
12 ahead --

13 MR. FRUMKIN: I think they want something  
14 later this morning, right?

15 MEMBER DENNING: Yes, later this morning.  
16 Absolutely, yes. Later this morning.

17 MEMBER APOSTOLAKIS: That's what happens  
18 when you have three hours.

19 MEMBER DENNING: Right, yes. Thanks. Can  
20 you run any of those tests by eleven?

21 MR. WOLFGANG: My name is Bob Wolfgang.  
22 I'm a fire protection engineer in NRR. And I'm going  
23 to give you information on the draft generic letter  
24 Post-Fire Safe-Shutdown Circuit Analysis Spurious  
25 Actuations.

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1           A summary of the presentation, I'll go  
2 over the purpose of issuing the generic letter, the  
3 information we are requesting from licensees, the  
4 background on this issue since 1997, the basis for the  
5 generic letter, the issue that is clarified in the  
6 generic letter, public comments, and a summary at the  
7 end.

8           The purpose of issuing the generic letter  
9 is to clarify how the NEI/EPRI cable fire test program  
10 reaffirms long-held regulatory positions and provide  
11 part of a foundation for licensees who are planning to  
12 transition to NFPA 805.

13           Also, to respond to the Agency's need to  
14 provide clarification and closure of outstanding fire  
15 protection issues, respond to --

16           MEMBER APOSTOLAKIS: Excuse me. Are you  
17 going to come back to these? I mean this on slide 16,  
18 the foundation for licensees planning to transition,  
19 will you elaborate on these later? Or can you tell us  
20 a few words now?

21           MR. WOLFGANG: Well, that's --

22           MEMBER APOSTOLAKIS: Why is that relative  
23 to NFPA 805?

24           MR. WOLFGANG: This is just to show that  
25 multiple spurious actuations should be included in

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1 their risk analysis model.

2 MEMBER DENNING: Well, since George has  
3 raised the question, let me ask it now. And that is  
4 NFPA 805 is one of the ways -- transitioning to NFPA  
5 805 is one of the ways that a licensee can respond to  
6 this. Now my question is how long does it take to  
7 transition to NFPA 805?

8 And I don't quite understanding within the  
9 time periods of the 90 days and six months and this  
10 kind of stuff, within the context of a transition to  
11 NFPA 805, when did that transition actually have to  
12 occur for the licensee to be able to use that pathway?

13 MR. WOLFGANG: All they have to do is  
14 respond to us within I believe it is the 90 days.  
15 That they are transiting to NFPA 805. And they will  
16 take care of this situation during that process.

17 MEMBER DENNING: Then how long would they  
18 have to transition to NFPA 805?

19 MR. WOLFGANG: They have -- what is it?  
20 Is it three years?

21 PARTICIPANT: Three years.

22 MEMBER DENNING: Three years?

23 MEMBER APOSTOLAKIS: Yes, it is a long  
24 time.

25 MR. KLEIN: Let me describe briefly. This

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1 is Alex Klein. Let me briefly describe the process a  
2 licensee would use if he wants to transition to NFPA  
3 805. And that is once the licensee had made the  
4 determination that he does want to transition to 805  
5 because that is an option for him, if he submits a  
6 letter of intent to the agency indicating that that is  
7 what he wishes to do.

8 At that point, we review that letter and  
9 make a determination as to whether or not the schedule  
10 that the licensee has laid out is acceptable to the  
11 Agency. And what we have right now in place is a  
12 three-year time frame for licensees to transition with  
13 the option of extending that time frame if the  
14 licensee can provide us with sufficient justifications  
15 beyond the three-year time period.

16 Now within that three-year time period, a  
17 licensee would submit their letter of intend, do the  
18 act of transition into NFPA 805. And then before that  
19 three-year time period is over, we would submit their  
20 license amendment to the staff for our review and  
21 approval prior to them actually receiving the  
22 amendment.

23 MEMBER APOSTOLAKIS: It seems to me that  
24 the -- actually is the first bullet in the previous  
25 slide that is important because the licensee that

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1 wants to transition to NFPA 805 has to convince you,  
2 I think, that they complied with all the regulations,  
3 right? There may be a few exceptions, as I remember  
4 for a period of time, and all that.

5 So the primary reason seems to be to  
6 reaffirm long-held regulatory positions because  
7 somebody who wants to transition has to demonstrate  
8 that they complied with all that.

9 MR. KLEIN: That is correct. Really I  
10 think the primary purpose of the generic letter is  
11 that first bullet on that slide 16.

12 MEMBER APOSTOLAKIS: Right, right.

13 MR. KLEIN: Yes. As an added benefit, it  
14 does provide the foundation for licensees who want to  
15 transition to 805.

16 MEMBER DENNING: Now wait a second. I  
17 definitely did not understand this. I mean clearly  
18 there are a lot of licensees out there that did not --  
19 cannot respond to multiple spurious actuations. And  
20 they are not going to have to bring their plant into  
21 compliance with having to meet all the multiple  
22 spurious actuations before going to NFPA 805 because  
23 then NFPA 805 doesn't help them at all, right?

24 MR. FRUMKIN: Yes, that is correct. And  
25 what Dr. Apostolakis was saying is correct is that we

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1 have an enforcement discretion in place so those  
2 licensees who discover during transitions that they  
3 are not in compliance can do a risk analysis of that  
4 and determine that it is not red, that it is not  
5 wilful, that it is not a severity one violation.

6 And, therefore, they can comp it -- put  
7 compensatory actions in place and move forward towards  
8 transition without necessarily correcting that in  
9 accordance with the old fire protection program.

10 MEMBER DENNING: But one thing that I  
11 think is an issue though and that is suppose there is  
12 a plant out there that would really like to do the  
13 NFPA 805 approach but within the 90-day period, don't  
14 they have to go through the entire analysis and  
15 identify the SSCs that are potentially vulnerable  
16 based upon this detailed multiple spurious actuation  
17 evaluation which seems to me like an extremely  
18 difficult problem to undertake.

19 Is that true that they have to really  
20 analyze the whole system within 90 days according to  
21 this multiple spurious actuations and identify  
22 vulnerable SSCs? Am I correct or not correct?

23 MR. WOLFGANG: Well, they have to -- well,  
24 I'll get to that on a slide here.

25 MEMBER DENNING: Okay, if you will get to

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1 it, you can go ahead.

2 MEMBER MAYNARD: I would like to challenge  
3 that first statement just a little bit though. And I  
4 know that it has been a long-held position by members  
5 of the staff but as far as, you know, NRC position,  
6 there are a number of licenses that were issued and  
7 plants inspected and with their programs were approved  
8 and licensed without making this assumption.

9 And I'm not convinced that it has clearly  
10 been a recognized regulatory requirement. And again,  
11 I know licenses were issued, programs were reviewed  
12 without making -- otherwise, we wouldn't even be here  
13 today if those licenses weren't issued at that time.  
14 So I would challenge that. The first statement.

15 MR. WOLFGANG: We know SERs have been  
16 issued for Byron and Braidwood with a single spurious  
17 actuation per fire event. And we've come to the  
18 conclusion basically that was issued as a mistake.  
19 That was a mistake.

20 MEMBER MAYNARD: But I know that there are  
21 a lot of plants out there a license. Their analysis  
22 were reviewed, their programs were reviewed. I know  
23 I was personally involved with them back in the '80s  
24 when some of these issues were starting to come to a  
25 highlight. And I know that there are a number of

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1 plants out there with licenses that although it may  
2 not be documented as clearly, that it was known that  
3 multiple spurious actuations were not taken in account  
4 in that analysis.

5 I don't think it is clear that this is  
6 just confirming compliance to requirements that were  
7 in place. I think it is a different set of  
8 assumptions.

9 MR. FRUMKIN: Yes, and this may, I agree  
10 that your assumptions apply to probably a number of  
11 plants out there. But for the most part, Appendix R,  
12 10 CFR 50, Appendix R, Section 3(g)(ii) and 3(g)(ii)  
13 which is the alternate and dedicated shutdown are what  
14 is in question.

15 The NRC went in and did an analysis of the  
16 3(g)(iii) alternate shutdown. And for a lot of  
17 3(g)(iii) which is, for lack of a better description,  
18 a control room abandonment, they allowed the  
19 assumption of one spurious actuation. 3(g)(ii) wasn't  
20 across the board inspected in the 80s. It was assumed  
21 that licensees could wrap or protect or would have  
22 adequate separation.

23 And it wasn't evaluated for multiple  
24 spurious because generally the staff didn't believe  
25 that -- well, I'm not sure why they didn't do it. But

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1 the big question was this alternate shutdown.

2 And in the 90s, we had the thermal lag.

3 And a lot of that wrap was taken out. And a lot of  
4 manual actions or assumptions were put into place.

5 And I don't mean to say that there was -- well, the  
6 point that I am trying to make is that there was  
7 another change. There was the removal of a lot of  
8 these thermal lag which was relied on to protect  
9 cables and probably would have mitigated many spurious  
10 actuations, many multiple spurious.

11 MEMBER MAYNARD: And I'm not saying at  
12 this point that they shouldn't be considered now. I'm  
13 challenging the regulatory positions that says all  
14 along everybody should have always done this. I think  
15 that, you know, we're now setting, you know, these are  
16 the things that definitely need to be considered.

17 If those were considered 20, 30 years ago,  
18 if that was part of the regulatory position for the  
19 licenses, we wouldn't have gone through a 20-year  
20 period here of trying to figure out what it really  
21 requires the licensee to do. Again, it's a regulatory  
22 -- I believe that this is something that falls within  
23 the backfit.

24 It needs a better analysis overall. And  
25 that doesn't mean that it is a bad thing to do. I'm

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1 just saying that I do not believe that we can take the  
2 position that this is a requirement that has already  
3 been there, that everybody should have already done.  
4 And that is kind of what we are saying in this generic  
5 letter.

6 MR. KLEIN: This is Alex Klein of NRR. I  
7 just wanted to add to the discussion here that -- and  
8 Bob can clarify this also for me -- is that the  
9 generic letter did receive CRGR approval. We did go  
10 to that Committee.

11 There are subsequent slides in Bob's  
12 presentation, I think 23, 24, 25, that does talk  
13 about the background, the regulatory background that  
14 you are speaking of that might clarify some of these  
15 discussion questions.

16 MEMBER MAYNARD: I'd be glad to look at  
17 that.

18 MR. WOLFGANG: Well, and also attend CFR  
19 Part 50, Appendix R, it also talks about you have to  
20 consider hot shorts. It doesn't set a limit on the  
21 number.

22 MEMBER MAYNARD: Well, I understand that.  
23 But there is a number of the regulations that come to  
24 an agreement between the licensee and staff as to what  
25 are -- what do you have to assume in a number of those

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1 things.

2 So anyway, we will get into it maybe aq  
3 little more with the regulatory evaluation. But I do  
4 not agree that --

5 CHAIRMAN WALLIS: Well, could we clarify  
6 this first bullet? I mean it seems to me that if we  
7 did have this long-held regulatory position, which was  
8 being enforced, then you wouldn't need this generic  
9 letter.

10 MEMBER MAYNARD: Right.

11 CHAIRMAN WALLIS: So something has changed  
12 as the result of these tests. So maybe there was a  
13 position which wasn't very well enforced or something  
14 or was not properly interpreted by the industry. Is  
15 that the problem?

16 MEMBER MAYNARD: Or the staff?

17 CHAIRMAN WALLIS: Well, the staff, yes.

18 MR. FRUMKIN: Well, I think we -- well,  
19 Bob, I think I would say that something did change.  
20 And that thing may not have been entirely the tests.  
21 I think that the staff had high confidence that these  
22 fire barriers that were installed were separating  
23 these redundant trains.

24 And they were removed and they were  
25 replaced with non-barrier solutions which were

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1 analysis, manual actions, and those type of things.  
2 And as soon as the NRC started inspecting post-thermal  
3 lag fixes, which was in 1997, well before these tests.  
4 We had numerous -- there was an information notice  
5 97-something which presented numerous hot short and  
6 multiple -- well, numerous alternate associated  
7 circuits and circuit failure type issues.

8 So to hang this entirely on the test is  
9 not -- certainly the staff position goes before -- to  
10 before the tests. And that has been documented in  
11 that generic -- that information notice and there was  
12 a letter sent to NEI which expressed this sentiment  
13 well before -- I believe that was before the test as  
14 well.

15 CHAIRMAN WALLIS: The purpose of the  
16 generic letter is to reinforcement your enforcement  
17 which you were a bit lax about before or something?  
18 Is that what its purpose is?

19 MR. WOLFGANG: There was a lot of  
20 confusion. You were talking about 3(g)(iii) about  
21 alternative and dedicated shutdown systems and the use  
22 of one only -- you had to consider one spurious  
23 actuation there --

24 MR. FRUMKIN: Right, 3(g)(iii) and the  
25 Generic Letter 86-10 talked about spurious actuations

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1 quite a bit but the staff position is that those  
2 didn't apply to 3(g)(ii) and they were erroneously  
3 applied to 3(g)(ii), which is all we're really talking  
4 about right now. We are not talking about these 3(g)  
5 (iii) inspections that occurred in the 80s. We're not  
6 talking about the 3(g)(iii) approvals.

7 Every 3(g)(iii) program should have been  
8 approved with an SER. That was the policy. But we  
9 did not go into the 3(g)(ii) areas because the  
10 barriers and those solutions should have been  
11 sufficient.

12 MEMBER MAYNARD: It just seems to me that  
13 with all the confusion that has gone on for a number  
14 of years on this, a much cleaner way of doing this is  
15 if the NRC believes that this is something that needs  
16 to be done is just to come out with it as a  
17 requirement following the process for rulemaking, for  
18 changes, or whatever rather than trying to handle it  
19 through a generic letter requesting information to  
20 show compliance with a very confusing set of  
21 requirements.

22 MEMBER-AT-LARGE SIEBER: I suspect,  
23 though, that the staff does not believe that  
24 rulemaking is required, that the proper regulations  
25 already exist.

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1 MR. FRUMKIN: That is correct.

2 MEMBER-AT-LARGE SIEBER: In the review  
3 process that the staff has used in the past does not  
4 establish new regulations. The regulations are the  
5 regulations. And how the staff reviews something is  
6 another matter.

7 MEMBER MAYNARD: Well, how they review it  
8 but what it is accepted as to your certain assumptions  
9 and things --

10 MEMBER DENNING: I'm sure we are going to  
11 come back to this issue. So why don't you go ahead --

12 MEMBER-AT-LARGE SIEBER: It won't go away.

13 MR. WOLFGANG: Okay, moving to the next  
14 slide, more purposes of issuing a generic letter,  
15 respond to the Agency's need to provide clarification  
16 and closure of outstanding fire protection issues,  
17 respond to the licensee's request to provide  
18 clarification of regulatory expectations, and respond  
19 to the region's request to provide clarification of  
20 regulatory expectations for circuit inspections. And  
21 circuit inspections were resumed January 2005.

22 Generic letter, what information it is  
23 requesting from the licensees. Within 90 days to  
24 evaluate their licensing basis and information in the  
25 generic letter regarding multiple spurious actuations

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1 in the Post-Fire Safe-Shutdown Circuit Analysis.

2 MEMBER MAYNARD: Is that practical to  
3 expect -- I think we might get into a little bit more  
4 as to what we are really asking here but within 90  
5 days, for the whole industry to do this, I'm sure  
6 there is going to be some resources -- external  
7 resources needed in some cases.

8 With the whole industry trying to use  
9 those, is 90 days really a practical time frame to get  
10 what is really being asked for here?

11 CHAIRMAN WALLIS: Well, we believe that it  
12 is. But, you know, I guess when NEI talks, they have  
13 a consensus from the industry that it is not a  
14 sufficient time, We can always adjust that.

15 MR. WOLFGANG: Yes, I think what is being  
16 asked here is not for the technical evaluation of the  
17 entire circuit analysis. What we are asking for is  
18 for licensees to report whether they have a multiple  
19 spurious licensing basis or they have a single  
20 spurious licensing basis.

21 For those plants that have a multiple  
22 spurious and haven't analyzed for multiple spurious,  
23 then that is going to be a long-term fix. All we are  
24 asking them to do is to report their situation within  
25 90 days, which is a licensing --

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1                   MEMBER DENNING: Wait a second. How do  
2 they submit their functionality assessment of effected  
3 SSCs without doing that total analysis? Am I missing  
4 something here? And this is within 90 days, if  
5 you're not in compliance, you have to submit this  
6 functionality assessment of effected SSCs.

7                   MEMBER APOSTOLAKIS: And compensatory  
8 measures.

9                   MEMBER DENNING: And compensatory  
10 measures. I think that is the whole analysis, isn't  
11 it? I mean you don't necessarily know how you are  
12 going to ultimately correct them but it seems to me  
13 that the analysis has to be done in 90 days.

14                   Incidentally, I should have mentioned that  
15 listening in is EPM, which is a company that does this  
16 kind of stuff. But I should have mentioned that  
17 earlier that we do have an open line here.

18                   I'm sorry, go ahead.

19                   MR. WOLFGANG: Yes, what we are asking --  
20 yes, to submit the functionality assessment of  
21 effected SSCs.

22                   MEMBER DENNING: Yes. How do you  
23 determine what SSCs are effected unless you have  
24 looked at the multiple spurious actuations.

25                   MR. WOLFGANG: Yes, they have to look at

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1 the multiple spurious actuations.

2 MR. FRUMKIN: First, I agree with the  
3 member that doing a full analysis for 104 plants in 90  
4 days is not going to be credible. This is a major  
5 effort to look at that.

6 I believe though that the second bullet of  
7 compensatory measures for these areas where the plants  
8 are capable of putting compensatory measures and then  
9 solving the problems in a long-term program. That is  
10 credible. That is possible.

11 MEMBER APOSTOLAKIS: It seems to me that  
12 the 90 days applies to the first bullet but not the  
13 sub bullets.

14 MEMBER MAYNARD: I think it does a -- it  
15 certainly applies to the first bullet.

16 MEMBER DENNING: But the sub bullets are  
17 there in the generic letter.

18 CHAIRMAN WALLIS: Well, why is there an  
19 assumption that they are not in compliance now? I  
20 mean that they have done various things today to meet  
21 the regulations already. And their position would  
22 probably be we are in compliance now. So what are you  
23 asking us to do?

24 MEMBER DENNING: No, I don't think so.

25 MEMBER-AT-LARGE SIEBER: Well, if you took

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1 the lag out of your plant --

2 CHAIRMAN WALLIS: That's the problem.  
3 They have changed something.

4 MEMBER-AT-LARGE SIEBER: You changed the  
5 configuration.

6 CHAIRMAN WALLIS: That is okay. So they  
7 have changed something. Thank you.

8 MEMBER DENNING: It is not just that,  
9 Graham. They have argued that this has not been the  
10 requirement. That you didn't have to do multiple  
11 spurious actuations. They did one at a time or a  
12 single. So they would argue this is not the  
13 regulatory -- they would argue that it is new  
14 requirement but kind of like Otto has.

15 MEMBER KRESS: But the regulation says  
16 broadly that under these conditions, you have to have  
17 one train of safe shutdown. And that can only be  
18 interpreted as multiple spurious actuation I think.

19 MEMBER MAYNARD: I don't think -- I don't  
20 agree with that. Through the regulatory process, you  
21 don't necessarily have to assume everything that  
22 anybody could ever conceivably come up with. And so  
23 that's why the NRC and the industry -- but you decide  
24 on a set of assumptions. And what you really have to  
25 assume to reasonably meet that requirement.

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1           And then as new information comes along,  
2           if those previous assumptions weren't conservative  
3           enough, you may need to do that. But that really  
4           constitutes a change there. Otherwise why would you  
5           have any guidance documents or any -- what is allowed  
6           to assume or whatever. So I would argue that it is  
7           part of it.

8           MEMBER DENNING: In some respect, this is  
9           an open-ended problem in terms of, you know, and so it  
10          begs for some kind of guidance as to where you end the  
11          search for things that can go wrong.

12          Continue.

13          MR. WOLFGANG: We are asking that within  
14          six months to submit the plan to return all effected  
15          SSCs to compliance with the regulatory requirements.  
16          And that is the plant modifications, license .  
17          Exemption request.

18          And we are also asking that within 30  
19          days, if you cannot meet the 90-day, six month  
20          schedule that we are requesting, you provide us  
21          notification you cannot meet it and your suggested  
22          schedule and completion date.

23          CHAIRMAN WALLIS: What kind of things  
24          would they do to come into compliance? Are they going  
25          to change these offending cables? Are they going to

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1 change the way in which they put out fires? Are they  
2 going to change the actual equipment in the SSC? It  
3 is very open ended what they are expected to do.

4 MR. WOLFGANG: Yes, they can protect  
5 cables. They can reroute cables. They can submit  
6 license amendments based on a risk analysis method --  
7 those type of things.

8 CHAIRMAN WALLIS: Manual actions?

9 MR. WOLFGANG: Well, not in 3(g)(ii)  
10 space. There are a lot of ways.

11 MEMBER DENNING: I don't know how  
12 expensive those ways are. I mean we say there are  
13 lots of ways but those ways may be extremely  
14 expensive.

15 CHAIRMAN WALLIS: Well, I'm also unclear  
16 about what it is they are supposed to assume can go  
17 wrong? When I read these things about they are  
18 supposed to assume the possibility that this can  
19 happen, it goes back to Otto's question here.

20 I mean if you assume the very worst that  
21 could possibly happen, then you could have enormous  
22 changes in the plants in order to avoid this worst  
23 conceivable thing. Is that what you are asking them  
24 to do?

25 MR. WOLFGANG: You have to assume all

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1 multiple spurious actuations.

2 CHAIRMAN WALLIS: Well, but that is a  
3 major thing, isn't it?

4 MEMBER MAYNARD: That is major.

5 CHAIRMAN WALLIS: You have to assume that  
6 it happens with the probability of one?

7 MR. WOLFGANG: Yes.

8 MEMBER-AT-LARGE SIEBER: Yes. On the  
9 other hand --

10 MR. WOLFGANG: 3(g)(ii) in deterministic  
11 space doesn't limit the number of --

12 MEMBER-AT-LARGE SIEBER: On the other  
13 hand, you restrict the fire to a single fire area,  
14 which means that if you have appropriate separation or  
15 fire barriers that you have a train that is free of  
16 fire, that will operate.

17 MR. WOLFGANG: Right.

18 MEMBER-AT-LARGE SIEBER: And that is the  
19 principle. I think it is going to vary dramatically  
20 from plant to plant, especially based on the age of  
21 the plant and the type of plant. I think some are  
22 going to be tremendously impacted. Some others may  
23 not. And again, depending on what assumptions you  
24 really have to make and what credit you can take for  
25 things you already have in place, things that have

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1 already been done, everything from operator actions to  
2 fire loadings, improvement in fire control,  
3 everything.

4 MEMBER DENNING: And, Jack, you talked  
5 about the separating of trains. And that's, you know,  
6 pretty straight forward. But isn't the real open  
7 endedness related to the spurious actuations where  
8 there is some unanticipated valve opens that effective  
9 give you a loss of coolant accident or something like  
10 that, that, you know, introduces a different element  
11 to safe shutdown. Isn't that the open-endedness that  
12 makes it so difficult.

13 And I also don't know whether -- how many  
14 plants really know what cables are in what trays  
15 within a room.

16 Obviously if you are going to do -- yes so  
17 that you basically are assuming anything within the  
18 room -- I mean you know that -- you have concluded  
19 that it has gone through a room up to this point.  
20 But, you know, they could be in totally different  
21 trays in the room. But you don't know where they are  
22 in the room.

23 CHAIRMAN WALLIS: Well, you have to assume  
24 that they are all together and they are all --

25 MEMBER DENNING: Assume that you have to

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1 submit it. But I don't know the answer to that.

2 MEMBER KRESS: Assume that you have to do  
3 it. But I don't know the answer to that.

4 MR. WOLFGANG: Well in a fire area in a  
5 room, if you assume a fire, you have to assume  
6 everything is --

7 MEMBER KRESS: Yes, but can everything  
8 have an inter --

9 CHAIRMAN WALLIS: Everything in that room  
10 can short together?

11 MEMBER KRESS: -- can it short together as  
12 an inter-cable connection even though it may be way  
13 separated?

14 MR. FRUMKIN: No, if it couldn't occur,  
15 then it wouldn't be -- I mean you wouldn't have -- we  
16 wouldn't be expecting energized cables to penetrate  
17 conduits. We wouldn't expect energized cables to jump  
18 from tray to tray.

19 Or, for example, DC current has to have  
20 the same path. If it is not in the same tray or same  
21 conduit you couldn't actuate that from an AC circuit  
22 or something of that nature.

23 MEMBER DENNING: I don't know whether --  
24 what utilities know what cables --

25 MR. FRUMKIN: Right, no, you are correct.

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1                   MEMBER DENNING: -- are in what trays you  
2 were going to run.

3                   MR. FRUMKIN: And that can be a very  
4 significant effort.

5                   One of the aspects is that for the  
6 3(g)(ii) area -- or for the 3(g)(iii) plants, some of  
7 the older plants are 3(g)(iii). And they don't have  
8 very much separation at all. But they have done a  
9 significant analysis that was reviewed in the 80s  
10 which we referred to earlier. And they do have the --  
11 because they have done that detailed analysis, they  
12 have the flexibility to do manual actions.

13                   So in effect, the newer plants with the  
14 good separation should be fairly well off. The older  
15 plants that had very little separation probably have  
16 done a lot of this analysis already and may already be  
17 in compliance.

18                   It is the middle plants that are more  
19 likely than the older plants to have the circuits  
20 traced. But they are kind of in the middle there.  
21 And they are the ones who I think are going to be  
22 having a more difficult time answering this generic  
23 letter.

24                   MEMBER-AT-LARGE SIEBER: That is a pretty  
25 limited number of plants then. This issue is, you

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1 know, I was a young man when this issue came out. The  
2 work has been done. And the plants that were built in  
3 the 80s, to my knowledge they all had pull tickets  
4 associated with cables when they were originally  
5 routed.

6 So you just run your computer and it tells  
7 you whether you've got separation or not. And if you  
8 don't, what circuits are offending circuits.

9 MR. FRUMKIN: Many plants have that. Or  
10 some plants have that.

11 MEMBER-AT-LARGE SIEBER: Some plants have  
12 it. Some plants had to do that all manually, hand  
13 over hand.

14 MR. FRUMKIN: But I just want to add one  
15 thing that the staff has come our with a statement --  
16 or, well, not really a statement but what 3(g)(ii)  
17 says is that when cables of the redundant trays are  
18 within the same fire area and are not protected, so if  
19 you have a area with train A equipment in it and no  
20 train B equipment or the train B is protected in  
21 accordance with 3(g)(iii) protection criteria, we're  
22 not -- so with the train B protected, we're not  
23 limiting the actions that -- the feasible and reliable  
24 actions for failures on train A.

25 So if you have a protected train outside

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1 of a fire area or protected with 3(g)(ii), the  
2 licensees can do feasible and reliable manual actions  
3 on the fire-effected train to let's say close that  
4 valve that opens spuriously or stop that pump that  
5 opens spuriously because there is a full -- typically  
6 from the control room, so there is good annunciation  
7 and indication, there is a full protected train  
8 outside of that fire-effected area.

9 And I'll just point to Alex and see if he  
10 nods at me. Okay, yes.

11 MEMBER-AT-LARGE SIEBER: And there is very  
12 limited amounts of equipment if you had a spurious  
13 actuation, would cause another accident like a LOCA.  
14 Some value opens in the valve is -- like a safety  
15 injection valve, is designed to pump in not pump out.

16 Okay, so there are check valves and things  
17 like that that would prevent that. But there area  
18 few cases -- PRVs for example --

19 MR. FRUMKIN: Yes, PRVs is one I was  
20 thinking of if you --

21 MEMBER-AT-LARGE SIEBER: Yes , that could  
22 open and --

23 CHAIRMAN WALLIS: New plant designs have  
24 this screw valves. And the spurious actuation of them  
25 create a LOCA.

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1 MEMBER-AT-LARGE SIEBER: Yes, but they  
2 have them so you get to a safer condition, right?

3 CHAIRMAN WALLIS: One question I was going  
4 to --

5 MEMBER-AT-LARGE SIEBER: It is just  
6 expensive to do it.

7 MEMBER DENNING: Yes, is there any kind of  
8 assessment as to what fraction of spurious actuations  
9 actually are deleterious as far as effecting safe  
10 shutdown capability? I mean has anybody in a risk  
11 study done that kind of an assessment? Or do you have  
12 any feeling as to the fraction of spurious actuations  
13 that will get you into trouble?

14 MR. FRUMKIN: Well, you asked for that.  
15 We have this bounding analysis that we did and you  
16 actually -- well, you have to look at a lot to find  
17 the ones that are going to give you problems from a  
18 spurious actuation standpoint. But in our bounding  
19 analysis, it took five pairs of spurious actuations in  
20 order to get a significant risk.

21 And it is because these spurious system --  
22 these multiple spurious effect systems that, you know,  
23 are the redundant train. So it effects both -- the  
24 train, the productive train or the unprotected train,  
25 and the redundant train so you really lose all your

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1 protection with these scenarios. And it doesn't --  
2 you have to look at a lot to find the bad players.  
3 And there don't actually have to be a lot of bad  
4 players, at least based on our bounding analysis for  
5 it to be of fairly high risk significance.

6 MEMBER DENNING: Continue please.

7 MR. WOLFGANG: Background since 1997,  
8 multiple LERs brought lack of consensus concerning  
9 circuits to the staff's attention. And this led to a  
10 moratorium on inspection of circuit issues back in  
11 1997.

12 In 2001, NEI/EPRI cable fire test  
13 demonstrated that multiple spurious actuations can  
14 occur. And they can occur in rapid succession or  
15 simultaneously without sufficient time for mitigation  
16 in between.

17 Therefore if a licensee doesn't account  
18 for multiple spurious actuations, and its circuits  
19 analysis, the licensee may not be in compliance with  
20 10 CFR 50.48 and 10 CFR Part 50, Appendix A, General  
21 Design Criteria, and (3) which require that a licensee  
22 provide and maintain free from fire damage, one train  
23 of systems necessary to achieve and maintain the safe  
24 shutdown.

25 Staff has developed the risk-informed

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1 approach to inspections to focus on risk-significant  
2 configurations based on the cable fire test. And this  
3 is RIS 2004-003.

4 MEMBER DENNING: Now let me ask with  
5 regard to that, I understand that that was prepared  
6 for inspection as opposed to compliance.

7 MR. WOLFGANG: Correct.

8 MEMBER DENNING: But is there a real  
9 reason why one couldn't use guidance of that type for  
10 compliance as well? Do you see a regulatory  
11 constraint that would prevent you from -- I mean from  
12 the regulations that exist now, do you think it would  
13 be incompatible for the staff to provide the  
14 equivalent, perhaps a perturbation off of that or  
15 perhaps a revision to NEI's risk-informed guidance?  
16 Why can't we do that?

17 MR. WOLFGANG: I think the thing is we  
18 haven't seen licensee's risk tools, their model that  
19 we would have to approve prior to them using any risk  
20 analysis.

21 MR. KLEIN: Let me take a shot at  
22 answering the question maybe at a higher level. And  
23 that is with respect to licensees who are required to  
24 meet the requirements of Appendix R. Don't today have  
25 the ability to change that regulation or the

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1 commitment to that regulation based upon risk  
2 information.

3 If they want to do that, they would have  
4 to seek an exemption request from us against the  
5 regulation. They may certainly use risk information if  
6 they want to come in and see us with an exemption  
7 request, that is certainly open to them.

8 But what I think Bob is indicating is that  
9 a licensee may not make a change in their plant using  
10 risk information and making the conclusion based upon  
11 their standard license condition that says that, you  
12 know, it doesn't effect their ability to achieve and  
13 maintain safe shutdown.

14 The staff has been telling licensees that  
15 we would like them to come in and see us for such an  
16 exemption request or a license amendment.

17 MEMBER DENNING: Yes, I understand that  
18 that is the way -- that is the process by which they  
19 would use risk information to do that. But this first  
20 bullet is generic. It is generic information as to  
21 how many combinations of things or what are kinds of  
22 situations that are -- could be expected to be risk  
23 significant?

24 Now I realize it is not totally complete  
25 but it, you know, it gave guidance to the inspectors

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1 as to what are the combinations of things that could  
2 risk significant to look at and make sure. And I  
3 don't see any reason why one couldn't effectively rule  
4 out some of this total space of situations that the  
5 applicant has to look at to be compliant.

6 Now, you know, Tom is saying -- and I  
7 think it is kind of the regulatory position that  
8 you've got to look at everything because anything that  
9 can prevent this safe shutdown pathway is a potential  
10 problem. But you used it for the inspector to give  
11 him guidance on what is risk important and not in the  
12 area.

13 Couldn't you have done the same to provide  
14 generic guidance on this is how far you have to go in  
15 this process of looking at multiple spurious  
16 actuations.

17 MR. FRUMKIN: Bob, let me -- I'll be  
18 candid. We tried very hard to read 3(g)(ii) as a --  
19 to be risk informed in the way you describe. And with  
20 help from our lawyers, we were unable to get there for  
21 those pre-`79 plants. And then there is also the  
22 Agency or the Commission has approved a risk-informed  
23 rule.

24 And although it is more comprehensive,  
25 that is out there. And we considered the possibility

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1 of a risk-informed changed to this rule, to the  
2 current 3(g)(ii), and there is currently a rule that  
3 has been promulgated by the Commission. So that did  
4 not seem like a credible approach.

5 CHAIRMAN WALLIS: Well, could I follow up  
6 on that? And I looked at this risk informed approach.  
7 It seems to be just advice on vendors --

8 MR. FRUMKIN: Yes?

9 CHAIRMAN WALLIS: -- to focus on certain  
10 configurations. Well, that's okay. Focus on what  
11 matters. But then how does this inspector decide to  
12 reach some sort of a finding that something is not  
13 adequate? Or is not in compliance. That would get  
14 closer to tying these things together because the  
15 whole question here is what do they have to do in  
16 order to be in compliance.

17 MR. FRUMKIN: That is correct.

18 CHAIRMAN WALLIS: And how does the  
19 inspector know when they are in compliance or not?  
20 Well, he has just chose to focus on these things. How  
21 does he then decide when he is focused whether or not  
22 they are in compliance?

23 MR. FRUMKIN: And the answer to that is  
24 they pull up the licensing basis and if the licensing  
25 basis, if they do not have -- are not licensed for

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1 single spurious, that are considered to be -- required  
2 to look for multiple spurious.

3 CHAIRMAN WALLIS: Well then what are they  
4 supposed to do?

5 MR. FRUMKIN: Then that would be -- that  
6 could be -- that would be a finding would be run  
7 through the risk analysis of this STP. It would be  
8 cited. And the licensee would have to resolve a  
9 finding in the normal manner.

10 MEMBER DENNING: Incidentally, I think  
11 your last statement about their legal interpretation  
12 of pre-`79 is very important as far as our  
13 considerations are concerned because I mean it could  
14 be indeed that we are in a box in terms of whether you  
15 can risk inform the current regulation or whether you  
16 would need to change a rule which is obviously a huge  
17 undertaking.

18 CHAIRMAN WALLIS: Well, I'm really  
19 wondering, you made an initial statement that we  
20 should have had a subcommittee meeting. We seem to be  
21 at the level of behaving like a subcommittee so trying  
22 to determine whether or not you are ready to go to the  
23 full Committee because there seems to be so many  
24 questions here. And yet we are here as a full  
25 Committee.

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1                   MEMBER DENNING: That is why we have three  
2 whole hours.

3                   CHAIRMAN WALLIS: You know subcommittees  
4 sometimes have the option of saying you guys aren't  
5 ready. You shouldn't go to the full Committee. But  
6 they are here.

7                   MEMBER DENNING: The full Committee has  
8 that same option, doesn't it?

9                   MR. WOLFGANG: To continue, in 2004, staff  
10 held a public meeting in Atlanta to discuss the staff  
11 positions and solicit stakeholder feedback. We worked  
12 with NEI to finalize an acceptable industry guidance  
13 document for circuit analysis. And that was NEI 0001.

14                   Staff issued RIS 2005-30 to clarify  
15 regulatory requirements for a circuit analysis. And  
16 that RIS addressed the terms associated circuits, any  
17 and all, and emergency control stations.

18                   And this draft generic letter was issued  
19 for public comment in October 2005. We held a public  
20 meeting in March of this year. And the pertinent  
21 public comments were incorporated into the final draft  
22 of the generic letter. And we also received CRGR  
23 approval to issue the generic letter.

24                   The basis for the generic letter -- the  
25 bulleted review of NRC regulations, generic

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1 communications, correspondence related to this issue.  
2 And we have references identified in the generic  
3 letter. The results of the 2001 NEI EPRI cable fire  
4 test program, prior to the cable fire test, there was  
5 very little information available regarding circuit  
6 failure during a fire which made enforcement of the  
7 regulations in this area difficult. And also input  
8 from inspectors on issues that needed to be addressed.

9 The issue clarified in the generic letter  
10 is multiple spurious actuations. As Dan said earlier,  
11 some licensees claim that only a single spurious  
12 actuation had to be assumed in their circuit analysis.  
13 This was based on a misinterpretation of Generic  
14 Letter 86-10 in response to question 5.3.10.

15 And also some licensees claimed multiple  
16 spurious actuation occur with sufficient time in  
17 between them to take mitigating actions.

18 CHAIRMAN WALLIS: Now this  
19 misinterpretation has been going on for how long?  
20 D.L. 86 is 9/86?

21 MR. WOLFGANG: Yes.

22 CHAIRMAN WALLIS: Over 20 years they have  
23 been under some misapprehension about the regulations?

24 MR. WOLFGANG: That is my understanding.

25 MR. FRUMKIN: In this section of the

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1 generic letter, it refers to the 3(g)(iii) associated  
2 circuits I believe. So it took 3(g)(iii) alternate  
3 shutdown -- I'm sorry -- it took this 3(g)(iii)  
4 assumption and applied it to 3(g)(ii) areas. And that  
5 is what this misinterpretation is describing.

6 MEMBER APOSTOLAKIS: Let me understand it  
7 a little bit the second bullet here. Suppose there is  
8 sufficient time between actuations? Okay, so you have  
9 the first one. You really don't know what the second  
10 one is going to be, right? It could be anything.

11 MR. WOLFGANG: Second.

12 MEMBER APOSTOLAKIS: Oh, let's say there  
13 are two --

14 MR. WOLFGANG: Actuations?

15 MEMBER APOSTOLAKIS: -- spurious -- yes.

16 MR. WOLFGANG: Yes, based on these tests,  
17 they could occur --

18 MEMBER APOSTOLAKIS: No, I understand  
19 that, that it is a very short time.

20 MR. WOLFGANG: Right.

21 MEMBER APOSTOLAKIS: But let's assume for  
22 a moment that there is sufficient time, there is long  
23 time between them.

24 MEMBER DENNING: And there may be, George.  
25 There is a contention that --

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1 MEMBER APOSTOLAKIS: Okay.

2 MEMBER DENNING: Yes, right.

3 MEMBER APOSTOLAKIS: But you still don't  
4 know what the second one is going to be.

5 MEMBER DENNING: Is going to be, right.

6 MEMBER APOSTOLAKIS: So you can really  
7 take mitigations actions without know what the second  
8 will be?

9 MEMBER DENNING: Well, now wait a second.  
10 If you have mitigated the first one --

11 MEMBER APOSTOLAKIS: Yes.

12 MEMBER DENNING: -- then it is as if you  
13 now just have one.

14 MEMBER APOSTOLAKIS: Oh, so now you are  
15 going to get together and wait.

16 MR. WOLFGANG: And when the second one  
17 occurs and you have time to mitigate that one.

18 MEMBER APOSTOLAKIS: And this is doable?  
19 I mean has anybody looked into the details of this?  
20 It comes back to this issue of open endedness. You  
21 really don't know what is going to happen next. So I  
22 don't understand this particular -- I mean have they  
23 submitted details, you know, if you have sufficient  
24 time, you will protect the plant?

25 MEMBER DENNING: You know what I think

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1 would help us is we had some better feeling as to how  
2 do they really mitigate these actuations?

3 MEMBER APOSTOLAKIS: Yes, exactly,  
4 exactly.

5 MEMBER DENNING: What is a typical -- and  
6 I know there are constraints on manual --

7 MR. WOLFGANG: Yes, in 3(g)(ii), they  
8 can't use manual actions.

9 MR. KLEIN: Licensees have commonly used  
10 operator manual actions to mitigate that spurious  
11 actuation. They may send an operator out in a plant  
12 to close a valve or some such action like that. And  
13 then they wait for the next actuation and they say,  
14 okay, I've got plenty of time available to have taken  
15 that first action. And now they wait for the second  
16 action. And when that occurs, they send the operator  
17 out.

18 So I think that second bullet there is to  
19 just simply indicate to the Committee that that is the  
20 claim that some licensees have made. That is not  
21 necessarily a position that the staff agrees with.

22 MEMBER APOSTOLAKIS: No, I understand  
23 that.

24 MR. WOLFGANG: Yes.

25 MEMBER APOSTOLAKIS: But I'm trying to

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1 understand the position.

2 MEMBER DENNING: Now suppose you had --  
3 suppose it takes 30 minutes to have them get out there  
4 and close the valve, now obviously -- more than, you  
5 know, and then something else happens say before he  
6 closes that valve, then the real question is there a  
7 compounding effect?

8 MR. WOLFGANG: And I guess like --

9 MEMBER DENNING: As far as you don't have  
10 enough operators that you can send out to do all these  
11 --

12 MEMBER APOSTOLAKIS: The real question is  
13 is the length of time the critical variable here. And  
14 it doesn't seem to me to be.

15 MR. FRUMKIN: I mean we'll give you an  
16 example, for example if you have a -- you going to  
17 drain two valves in series that would drain the RWST  
18 and you also damage a number of other equipment. They  
19 fail. They short out and become unavailable.

20 Well, if you have -- if you lose the  
21 indication on the RWST and you open up the valve and  
22 you say you have plenty of time to -- you have  
23 indication the valve opened spuriously, you can go  
24 down and close the valve and then when the next valve  
25 opens, it has no effect.

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1 I think that would be an example of where  
2 they feel they would have sufficient time. Let's say  
3 the circuits are in cable trays -- you know, 20, you  
4 know, six cable trays above. There is going to be a  
5 good deal of time before the first cable tray is  
6 damaged and the next -- the first cable is damaged and  
7 then the next cable.

8 So -- and from a risk standpoint, you  
9 might be able to argue yes, we will have adequate  
10 indication that the valve opened and we have adequate  
11 time. And then that could be a risk-informed type  
12 analysis.

13 But if they are in the same cable, then  
14 they both could open simultaneously.

15 MEMBER MAYNARD: If there is time and  
16 there are a number of things they can do, when you  
17 have a fire in an area, you typically know what cables  
18 and what other things could be potentially effected in  
19 that and the manual actions going out either manually  
20 isolating valves, pulling breakers, a number of things  
21 you can do. But it is based on what is in that area  
22 or what could be effected with those in that area.

23 MEMBER APOSTOLAKIS: I remember when I was  
24 reading the analysis of the Browns Ferry fire a long  
25 time ago. They did have spurious actuations there did

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1 they not?

2 MR. WOLFGANG: Yes.

3 MEMBER APOSTOLAKIS: Within 20 minutes I  
4 believe they had all sorts of signals and so on. And  
5 then things started going dead. How does that  
6 experience fit into this?

7 MR. FRUMKIN: I think that experience is  
8 "the long-held staff position" that multiple  
9 simultaneous spurious actuations occur. I think when  
10 you want to point your finger to where we come up with  
11 that, it comes from 1975. It comes from the very  
12 beginning of fire protection regulation is that these  
13 spurious actuations occur.

14 And I think that -- unfortunately the  
15 statements of consideration for Appendix R are short.  
16 You know we have, you know, dozens of pages for a  
17 short NFPA-805 and there may be a dozen pages and a  
18 page maximum for 3(g)(iii) -- for 3(g) of Appendix R.  
19 So we really can't go back in time and pull out the  
20 basis for that. But we have Mark Sallies here, he  
21 might be able to shed some light on that.

22 But I believe that that is the long-held  
23 staff position is the Appendix R fire and these  
24 multiple spurious and rapid succession starting pumps  
25 giving incorrect indication, doing all sorts of

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1 unpleasant things to the plant.

2 CHAIRMAN WALLIS: The incorrect indication  
3 is a big problem. Something has happened and yet you  
4 don't know quite what has happened. That is another  
5 variable altogether from the time. I mean it is the  
6 uncertainty of knowing what is going on which might  
7 lead the operator to do the wrong thing.

8 MEMBER-AT-LARGE SIEBER: Yes, on the other  
9 hand, indications usually either go full scale or to  
10 zero.

11 MEMBER MAYNARD: A lot of times you've got  
12 multiple indications. And that is something they are  
13 trained on quite a bit is on instrument failures.  
14 That said, it is not uncommon to have an instrument  
15 failure without a fire. So they are trained on how to  
16 handle that.

17 MR. FRUMKIN: Right. One of the failure  
18 though they can also get -- and, again, there's  
19 multiple indications, but they could get an indication  
20 of a pump starting when it didn't start. Or a pump in  
21 a start and stop position and then that's going to  
22 take time for them to troubleshoot and whether it was  
23 started or stopped could it be adversely effecting  
24 overfilling the plant or not.

25 There are a number of timing issues that

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1 I'm sure they are trained on. But they can be  
2 potentially challenging.

3 MEMBER DENNING: Continue.

4 MR. WOLFGANG: The NRC letter from Sam  
5 Collins to NEI in 1997 stated that multiple spurious  
6 actuations caused by fire-induced hot shorts must be  
7 considered and evaluated. As I stated earlier, Byron  
8 and Braidwood have SCRs approving the assumption of a  
9 single spurious actuation for a fire event. So if the  
10 staff position is applied to them, it would be  
11 considered compliance backfit.

12 The generic letter --

13 MEMBER-AT-LARGE SIEBER: That's a unique  
14 case, those two plants.

15 MR. WOLFGANG: Yes, correct. The generic  
16 --

17 MEMBER APOSTOLAKIS: But what does that  
18 mean now?

19 MR. WOLFGANG: They are in compliance by  
20 definition.

21 MEMBER APOSTOLAKIS: You would say the SCR  
22 was not correct or what?

23 MR. WOLFGANG: They are in compliance by  
24 definition, right.

25 MEMBER APOSTOLAKIS: But I don't

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1 understand this compliance backfit.

2 CHAIRMAN WALLIS: Compliance by mistake is  
3 what I heard earlier.

4 MR. WOLFGANG: Well, by regulatory  
5 approval.

6 MEMBER APOSTOLAKIS: Can you explain the  
7 parenthesis? If stop position is applied to them, it  
8 would be a compliance backfit. You mean the current  
9 position?

10 MR. WOLFGANG: If they comply with their  
11 SER, the SER is approved even though it was a mistake,  
12 it would be a compliance backfit if we made them  
13 change.

14 MEMBER APOSTOLAKIS: So you would have to  
15 admit then that the SER was not correct?

16 MR. WOLFGANG: We have already admitted  
17 that.

18 MEMBER APOSTOLAKIS: Okay.

19 MEMBER MAYNARD: It is a matter of what  
20 regulatory process is used to actually do it. A lot  
21 fo people think backfit is a bad thing. I think it is  
22 a process that should be used a little bit more rather  
23 than trying to go around a lot of these things. Just  
24 say hey look, we've changed or this is a new  
25 requirement. Here's the regulatory burden. Here is

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1 the increased safety benefit. We are imposing this as  
2 the new requirement for you. It's not necessarily a  
3 bad thing. Just what regulatory burden --

4 MEMBER APOSTOLAKIS: But this doesn't  
5 happen too often, right? I mean --

6 MEMBER DENNING: What? Regulatory  
7 mistakes?

8 MEMBER APOSTOLAKIS: Yes.

9 MEMBER DENNING: Right.

10 CHAIRMAN WALLIS: Well, this last bullet,  
11 I have a lot of problem with. And they must be  
12 considered and evaluated. But it seemed to be very  
13 unclear about to what depth and by what methods these  
14 things must be considered and evaluated. That seems  
15 to be so open-ended that the licensee must be  
16 uncertain what he has to do.

17 MEMBER DENNING: RIS provides more detail  
18 than the generic letter does, right. The 2005 RIS.

19 MR. WOLFGANG: 2005-30?

20 MEMBER DENNING: Yes.

21 MR. WOLFGANG: Not on multiple spurious  
22 actuations, no.

23 MEMBER DENNING: No?

24 MR. WOLFGANG: It doesn't address that.

25 We didn't put that in there because we thought

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1 multiple spurious actuations because of this Byron and  
2 Braidwood SCR could be considered possibly a change in  
3 staff position. So that's why we didn't want to put  
4 it in a RIS.

5 CHAIRMAN WALLIS: There is no regulatory  
6 guide that says how to evaluate multiple spurious  
7 actuations?

8 MR. KLEIN: I think if I could respond to  
9 that question, I'll ask Dan also to pipe in. Is on  
10 page 7 of the generic letter where we do talk about,  
11 you know, ways that licensees can bring themselves  
12 into compliance, there is a discussion in there about  
13 the deterministic methodology or NEI-0001.

14 We do talk about the guidance in there in  
15 Chapter 3. We do say that for post-fire safe-shutdown  
16 circuits in conjunction with the guidance provided in  
17 this generic letter that NEI-0001 is one of the  
18 acceptable approaches to achieve regulatory compliance  
19 with the fire protection requirements for multiple  
20 spurious actuations.

21 So that's one example. And Dan can  
22 correct me if I've overstated this.

23 MR. WOLFGANG: And we say in conjunction  
24 with the guidance provided in this generic letter to  
25 mean consider multiple spurious actuation. I believe

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1 NEI-0001 says to consider two spurious actuations.

2 CHAIRMAN WALLIS: That doesn't mean  
3 anything to me. It could simply mean to say well I  
4 considered it and I think it is irrelevant or  
5 something. I mean what does consider mean? But what  
6 depth? By what methods?

7 MEMBER APOSTOLAKIS: To the depth required  
8 to convince the staff.

9 MEMBER BONACA: That is called open ended.  
10 We could fix it here but it seems to me that, you  
11 know, we do have a problem. And we are trying to  
12 figure out what is the best regulatory process to  
13 solve it. But the problem is there.

14 CHAIRMAN WALLIS: Well, I think we agree  
15 there is a problem. It is just whether or not there  
16 is a mature enough process in place to make something  
17 that is workable happen.

18 MEMBER BONACA: I understand.

19 MEMBER-AT-LARGE SIEBER: Well, this work  
20 has already been done once. The only thing that  
21 changed is the disqualification of certain fire  
22 barriers. All the licensees have done this. And it  
23 should be part of their licensing basis. There should  
24 be plant records as to how they did it the first time.

25 MEMBER DENNING: Really, Jack? I mean

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1 isn't there an issue here of the number of licensees  
2 who thought that they were really dealing with one  
3 spurious actuation requirement? Or one at a time?

4 MEMBER-AT-LARGE SIEBER: I can only speak  
5 to one licensee or about one licensee. And that was  
6 not the assumption.

7 MEMBER DENNING: That was not your  
8 assumption.

9 MEMBER-AT-LARGE SIEBER: No.

10 MEMBER DENNING: No. But there are  
11 licensees out there --

12 MEMBER-AT-LARGE SIEBER: Otto, was that  
13 yours? It is sort of obvious from Browns Ferry that  
14 you get more than one.

15 MEMBER MAYNARD: I'm trying to recall  
16 because the only place where we had different trains  
17 mixing was in the control room so it was primarily a  
18 control room-related issue.

19 MEMBER KRESS: But that is one purpose of  
20 the generic letter to find out the status.

21 MEMBER-AT-LARGE SIEBER: The only time the  
22 number of faults becomes an issue is when you are  
23 trying to solve the problem with operator manual  
24 actions. So now you've got too many things for too  
25 few people to do.

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1           But if you have train separation and the  
2           train separation is effective, you are going to get  
3           some spurious actuations which are going to be  
4           upsetting but not fatal. And you are still going to  
5           maintain a full set of safety equipment that  
6           functions. And that is the object of the fire  
7           protection regulation.

8           MR. KLEIN: I would strongly agree with  
9           what Dr. Sieber just indicated in that the focus here  
10          is on 3(g)(ii) compliance and that is where you've got  
11          the redundant trains in the same fire area as Dan had  
12          indicated. And Dan had indicated some of the history  
13          that, you know, led us up to this.

14          And that had to do with the resolution  
15          that some licensees used to address the thermal lag  
16          issue where they removed some of these fire barriers  
17          and in lieu of meeting the separation requirements of  
18          3(g)(ii), elected to put in place the use of operator  
19          manual actions.

20          And I think that is a very important thing  
21          to kind of keep in mind.

22          MEMBER-AT-LARGE SIEBER: But other  
23          licensees pulled no cable.

24          MR. KLEIN: That is correct. I'm not --

25          MEMBER-AT-LARGE SIEBER: They moved

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1 circuits out of the same fire area.

2 MR. KLEIN: Yes, I'm not suggesting that  
3 all licensees implemented unapproved operator manual  
4 actions in lieu of the requirements of 3(g)(ii).

5 There are other licensees who did plant modifications,  
6 did re-analysis, did re-wraps, pulled cables, what  
7 have you to bring themselves back into compliance with  
8 3(g)(ii).

9 MEMBER-AT-LARGE SIEBER: And some of them  
10 didn't use thermal lag to begin with.

11 MR. KLEIN: That is correct.

12 CHAIRMAN WALLIS: Well, I don't really  
13 have a good understanding of what kind of spurious  
14 actions we are talking about, what kind of operator  
15 actions in response we're talking about, and whether  
16 redundant trains solve the spurious action problem.

17 If I have a fire scenario and it switches  
18 on my high pressure injection, I've got a pump that  
19 runs and it is pouring water into the system, right?  
20 For one thing, I have to know -- I have to diagnose  
21 what is happening. Do I have to send somebody  
22 somewhere to shut a valve? And does that factor have  
23 some redundant train help me at all when something has  
24 been activated spuriously? I mean it is not clear to  
25 me what the range of kind of scenarios is that you are

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1 talking about here.

2 And whether redundant trains always help  
3 you or don't. Maybe they don't help you at all  
4 sometimes. And maybe the operator action sometimes is  
5 so severe that it is very difficult to take.

6 MEMBER MAYNARD: I think in most cases,  
7 there are things they can do. But there are some --  
8 and I think the power operator relief valve is one  
9 that if you have a system where you can't operate the  
10 block valve or the PRE, if it opens you basically have  
11 given yourself a small break.

12 CHAIRMAN WALLIS: That's what I think.  
13 When you think about TMR, they had a false indication  
14 because there was a light which said it was closed  
15 when it was open.

16 MEMBER MAYNARD: But most times you are  
17 still covered by -- I mean you are still analyzed for  
18 a small break LOCA or for the other events. A pump  
19 coming on, there are multiple ways to turn pumps off.  
20 And you are not going to be injecting water at such a  
21 rate that you have, you know -- I'm kind of talking  
22 more PWR than I am BWN here so I --

23 MEMBER DENNING: But it is those things  
24 though -- it is the multiplicity of those things that  
25 boggles my mind. You know rather than train

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1 separation and train protection which you talked  
2 about, it just seems like there is such a multiplicity  
3 of potential things and trying to analyze all those  
4 things seems almost open ended.

5 MEMBER-AT-LARGE SIEBER: There aren't --  
6 in sheer numbers, there aren't all that many safety  
7 circuits. And if you go underneath the control room  
8 into the faucet rafter, you'll find loads of jumpers  
9 and knife switches and things like that where you can  
10 de-energize control circuits.

11 Now one of the problems is that it  
12 actually, in a lot of circuit breakers, it takes power  
13 to trip it, you know. The trip coil requires  
14 energization so pulling a knife switch doesn't  
15 guarantee that it will run forever. And so the  
16 operator really has to understand how the control  
17 system is set up to be able to do that.

18 But there are ways to overcome these  
19 problems that don't require excursions all over the  
20 plant. And on the other hand, the plant is designed  
21 to be safe provided that you have a functional safety  
22 train. Separation criteria, if rigidly applied,  
23 provides that independent safety train.

24 MEMBER DENNING: We are going to now take  
25 our break until 20 after 10. And then we will have to

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1 move surprisingly quickly after that.

2 CHAIRMAN WALLIS: Okay. So we're going to  
3 take a break until 20 past 10.

4 (Whereupon, the foregoing matter went off  
5 the record at 10:09 a.m. and went back on the record  
6 at 10:23 a.m.)

7 CHAIRMAN WALLIS: Rich, would you resume  
8 the management of the meeting, please?

9 MEMBER DENNING: Please proceed.

10 MR. WOLFGANG: Okay. The last issue,  
11 clarifying the generic letter, the point we have here  
12 is the staff position on multiple spurious actuations  
13 presented in the generic letter is consistent with  
14 section 9.5.1 of the standard review plan.

15 Public comments. The significant public  
16 comment was that the generic letter constituted a  
17 backfit to licensees. And we addressed this comment.  
18 We obtained CRGR approval to issue this generic  
19 letter. And, as I said earlier, only for Byron and  
20 Braidwood, who have approved SERs that we know of,  
21 would this constitute a backfit.

22 Basically, this generic letter is just a  
23 request for information.

24 MEMBER MAYNARD: I would challenge that.

25 MR. WOLFGANG: Yes. I think --

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1                   MEMBER MAYNARD: That's all right. We'll  
2 comment on that.

3                   CHAIRMAN WALLIS: It isn't just a request  
4 for information. It asks them to do a lot of things.

5                   MEMBER MAYNARD: Yes. That is what I  
6 challenge, that statement. Yes. We've talked about  
7 it.

8                   CHAIRMAN WALLIS: That was what I was  
9 uncertain about.

10                  MEMBER DENNING: Why don't you go ahead  
11 and summarize, even though we're going to have a  
12 couple of other things? Why don't you go ahead and  
13 summarize? Then there are a couple of other things we  
14 would like you to -- we have more than started. We're  
15 almost done.

16                  MR. WOLFGANG: A summary. The generic  
17 letter, as I said before, is a request for information  
18 from licensees. The industry cable fire test program  
19 reaffirmed the staff interpretation of the regulatory  
20 requirements concerning multiple spurious actuations  
21 must be considered in the circuits analysis. The  
22 generic letter is necessary to ensure that all  
23 risk-significant circuit situations are identified and  
24 addressed.

25                  CHAIRMAN WALLIS: Could you go back a bit

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1 and say something about why this came about? I mean,  
2 wasn't this something to do with this thermal lag  
3 business? All of these installations, like Hemmicks  
4 and Eastern, every time we look at them --

5 MR. WOLFGANG: Yes.

6 CHAIRMAN WALLIS: Well, isn't that the  
7 solution would be to have a proper barrier around  
8 these things?

9 MR. WOLFGANG: That's one solution, yes.

10 MEMBER DENNING: I don't see that as a  
11 total solution. I don't --

12 MR. WOLFGANG: That is one solution.  
13 Another solution is a separation, 20-foot separation.

14 CHAIRMAN WALLIS: But in the past, when we  
15 believed that this thermal lag worked, there wasn't a  
16 problem. Is that right?

17 MEMBER MAYNARD: No. I think the problem  
18 was still there then. This has been bounced around  
19 since I know at least the early '80s as an issue. I  
20 think the thermal lag, it helped in some cases where  
21 you could show separation in the trains, but it  
22 doesn't necessarily take care of you if you've got  
23 cables in the same area that are --

24 MEMBER DENNING: Right. They can still  
25 give you spurious actuation, regardless.

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1 MEMBER MAYNARD: Right.

2 MEMBER DENNING: Now, it may be -- do you  
3 have any comments on that?

4 MR. FRUMKIN: Yes. If you have the  
5 separation, you can still get spurious actuations.  
6 And that's a box that we're not in with the rule. The  
7 rule does not require that those be protected. So all  
8 plants have the flexibility for the unprotected train  
9 to mitigate through feasible and reliable manual  
10 actions those types of spurious actuations.

11 Now, if you were to get a spurious  
12 actuation that were to give you all incorrect  
13 indication and was not recoverable, then that would  
14 still have to be resolved because it would be a  
15 potential safety issue. But for the minor ones that  
16 we have been talking about that would be fairly easy  
17 to resolve through a manual operator action or there  
18 are procedural controls or something of that nature,  
19 that would not be a compliance issue per se.

20 MEMBER DENNING: Help me with that because  
21 I still don't quite understand it. So if you have a  
22 protected train and you get a spurious actuation from  
23 an unprotected train, then you have to analyze all  
24 combinations of spurious actuations still, don't you,  
25 that are possible in that unprotected train?

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1 MR. FRUMKIN: Alex, do you want to?

2 MR. KLEIN: Yes, I believe you do because  
3 the over-arching requirement of appendix R is to be  
4 able to safely bring your plant to safe shutdown. And  
5 if you don't know what's occurring in your plant, then  
6 you can't meet that over-arching high-level goal of  
7 achieving and maintaining safe shutdown of your plant.

8 MR. FRUMKIN: And I will just say that  
9 once you have your protective train, your protected  
10 train, your unprotected train has a very limited set  
11 of things that could hurt you.

12 Now, we're talking we have plenty of  
13 water. We have plenty of indication. We have plenty  
14 of everything. But now we might open, we might cause  
15 a drain letdown path to open or we might cause a pump  
16 to start, but we should be getting clear indication of  
17 that in the control room. And in the normal  
18 procedure, process, you'll be getting indication of  
19 these things happening. And they should be able to  
20 mitigate them fairly effectively.

21 Now, there may be some things that would  
22 be difficult to mitigate. And, as Alex says, they  
23 have to find those and find a way to mitigate them.

24 MEMBER DENNING: So you have lots of  
25 things you have to analyze, but the mitigation of it

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1 is probably not too severe for the plant, and the  
2 plant is allowed to do manual action on it.

3 Now, there is another set here. So what  
4 is the other set? Aren't you always required to have  
5 a protected train?

6 MR. FRUMKIN: Yes. And these plants don't  
7 have that protected train. In effect, all circuit and  
8 manual action findings or potential violations are  
9 lack of protection, lack of circuit protection.

10 MEMBER DENNING: Circuit separation.

11 MR. FRUMKIN: So when --

12 MEMBER DENNING: Separation of the --

13 MR. FRUMKIN: Right. So when a finding  
14 comes in, let's say we have that hypothetical finding,  
15 which opens up and drains down the RWST. The citation  
16 is going to be against 3G2, lack of separation and  
17 lack of protection.

18 Now, we don't require one protection  
19 method over another, but they didn't put a protection  
20 method in there to protect the -- well, RWST is a bad  
21 example because it is not a necessarily one-train  
22 system.

23 But let's say you have both trains being  
24 affected by a fire. And here this is probably what is  
25 the more likely scenario. One train is just going to

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1 be damaged by the fire and not work, and then the  
2 other train is going to have the spurious actuation.

3 We don't necessarily need both trains to  
4 have spurious actuations. So that's the situation.  
5 It doesn't have to be multiple spurious on multiple  
6 trains.

7 MEMBER APOSTOLAKIS: Have we agreed that  
8 the first bullet is not quite correct? We're asking  
9 for more than just information?

10 MR. FRUMKIN: It's clear.

11 MEMBER APOSTOLAKIS: Yes.

12 MEMBER DENNING: It just takes them a lot  
13 of work to do it. I think we all recognize that it's  
14 a request for information, but in order to produce  
15 that information, you have to do a lot of work.

16 MEMBER APOSTOLAKIS: Right. It sounds to  
17 me like the priest saying, you know, "I know you're a  
18 sinner, George. Now, you go away and think of all the  
19 ways in which you could be a sinner and come back and  
20 tell me what they are." I have thought about it.

21 CHAIRMAN WALLIS: It's already been  
22 analyzed.

23 MEMBER APOSTOLAKIS: I protected myself.

24 MEMBER DENNING: Let's go on. And I would  
25 like to hear the conservative risk analysis. And so

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1 would you give us a little presentation on the  
2 conservative risk analysis?

3 MR. FRUMKIN: Are you done with all of  
4 your slides?

5 MEMBER DENNING: Yes.

6 MR. WOLFGANG: Yes. I just want to say  
7 one thing. If we don't issue a generic letter, we'll  
8 have to use the inspection process behind these  
9 problems.

10 It will take longer. We estimate three  
11 triennials, nine years. And some risk-significant  
12 items may be missed. We don't know because the burden  
13 is put on us, instead of the licensee. I just want to  
14 bring it up.

15 MEMBER DENNING: Thank you.

16 MEMBER BONACA: Is it with regard to the  
17 90 days with the responses? I mean, how did you come  
18 up with the 90 days, recognizing that you have to go  
19 to award to provide these responses? Was there an  
20 evaluation that you performed?

21 MR. WOLFGANG: No.

22 MEMBER BONACA: I mean, can it be changed?

23 MR. WOLFGANG: It can be changed. It was  
24 an arbitrary period that we thought was --

25 MEMBER APOSTOLAKIS: Or you can reduce the

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1 requirement.

2 MR. WOLFGANG: Yes, or we can --

3 MEMBER APOSTOLAKIS: So we don't have  
4 these?

5 MR. FRUMKIN: No, you don't have these  
6 slides. We will be making them available.

7 MR. KLEIN: Just as a reminder, if I can  
8 just follow up on the 90-day issue and the comments in  
9 regard to that, we do have a bullet in there that, for  
10 licensees who can't meet that 90-day requirement, that  
11 within the 30 days, they come in and request an  
12 extension.

13 MEMBER MAYNARD: Yes. And I saw that in  
14 the generic letter. If it's a situation where you  
15 know 90 percent of the industry is not going to be  
16 able to do it, you might as well be able to pick a  
17 date where everybody is not having to do it. I'll be  
18 interested in hearing from the industry as to whether  
19 they think that is a burden or not. I think I am  
20 assuming it is, but it may not be. So I don't know.

21 MR. FRUMKIN: This is a bounding risk  
22 analysis for multiple spurious actuations. It was  
23 developed for this meeting by Ray Gallucci, Dr. Ray  
24 Gallucci, who is in the Fire Protection Section. And  
25 it's been presented as a paper for the American

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1 Nuclear Society presentation. I think this winter  
2 they're having a meeting.

3 I am the third string presenter of this  
4 document. Ray is the first string. Dr. Weerakkody is  
5 the second string. And I'm presenting out of  
6 necessity.

7 MEMBER DENNING: Is Ray here to get beaten  
8 upon if he --

9 MR. FRUMKIN: No. Ray is on inspection at  
10 Browns Ferry. So we have --

11 MEMBER APOSTOLAKIS: Last time he was here  
12 he --

13 MEMBER DENNING: No wonder he's at Browns  
14 Ferry.

15 MR. KLEIN: Let me clarify. He's on a  
16 program review at Browns Ferry. He's not on an  
17 inspection.

18 MR. FRUMKIN: Okay. I'm sorry. These  
19 slides will be made available. My understanding of  
20 this analysis is using an older plant PRA that Ray was  
21 involved in, he pulled out some of the important  
22 measures for some hot shorts. And he recombined them  
23 into multiple hot shots and, using a simplification  
24 process, determined a bounding risk analysis for those  
25 based on those important measures for one plant's PSA.

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1           So this is the typical older nuclear power  
2 plant, has a fire CDF of  $3.3^{-5}$ . And they used a hot  
3 short probability of .1. They had modeled 24 of the  
4 basic events. And that contributed about 5 percent to  
5 the fire CDF or  $1.8D^{-6}$ .

6           And then there were some systematically  
7 symmetric redundant train components that were chosen  
8 because I think they had more of a larger impact on  
9 the plant risk if they were to fail together. And  
10 that was a contribution of .03 to the fire CDF, those  
11 10 items.

12           MEMBER DENNING: Let's go slowly so we --

13           MEMBER APOSTOLAKIS: Yes.

14           MEMBER DENNING: -- understand what we  
15 have here.

16           MR. FRUMKIN: Okay.

17           MEMBER APOSTOLAKIS: Twenty-four hot short  
18 basic events above truncation. What does that mean?

19           MR. FRUMKIN: That in the model, the ones  
20 that had remained as important remained having  
21 importance measures in the model, that there were only  
22 24 hot shorts that remained there.

23           MEMBER APOSTOLAKIS: The core damage  
24 frequency due to hot shorts is  $1.8 \cdot 10^{-6}$  per year, it  
25 says.

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1 MR. FRUMKIN: Correct, assuming a hot  
2 short probability of .1.

3 MEMBER APOSTOLAKIS: Which was low.

4 MR. FRUMKIN: Which is low based on  
5 current data.

6 MEMBER KRESS: Okay. So one, it would be  
7 1.8 times  $10^{-5}$ .

8 MR. FRUMKIN: If you said 1.0, correct.

9 MEMBER DENNING: Now, you said that that's  
10 low, but don't forget here that now we're talking  
11 supposedly real nuclear power plants with fires where  
12 you would take into account the fact that the fire may  
13 not damage any cables, you know.

14 MR. FRUMKIN: Right. Well, this is from  
15 an --

16 MEMBER DENNING: Oh, this is --

17 MR. FRUMKIN: -- old fire PSA. So this  
18 does consider --

19 MEMBER DENNING: Yes, it does.

20 MR. FRUMKIN: -- many of those factors.

21 MEMBER DENNING: But saying that the  
22 probability of your hot short is .1 and saying, "Well,  
23 that is low," I think because we saw those other  
24 things where people say, "Well, it could be .6 or .2  
25 or something like that," --

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1 MR. FRUMKIN: Right.

2 MEMBER DENNING: -- and, therefore, this  
3 is low, that doesn't necessarily follow.

4 MR. FRUMKIN: I think this is the  
5 conditional hot short probability based on cable  
6 damage.

7 CHAIRMAN WALLIS: How about multiple  
8 shorts come into this?

9 MR. FRUMKIN: That is what we are going to  
10 be talking about.

11 CHAIRMAN WALLIS: This doesn't address  
12 that?

13 MR. FRUMKIN: No, no. Right. This is  
14 what this analysis is. So assuming that the  
15 components within each pair -- these are those ten  
16 items that have been paired -- have similar failure  
17 characteristics and locations, including their cable  
18 runs, again, this is a conservative assumption and  
19 that these comprise the full set of candidates for  
20 multiple spurious actuations that are not specifically  
21 modeled in the traditional IPEEEs as --

22 MEMBER APOSTOLAKIS: The number you showed  
23 us earlier assumes that these happen independently?

24 MR. FRUMKIN: Yes.

25 MEMBER DENNING: You know, I still don't

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1 understand the pairing. What is going on here? Is it  
2 ten corresponding to --

3 MEMBER APOSTOLAKIS: Ten of these?

4 MEMBER DENNING: Five paired components.

5 That means that there is a --

6 MEMBER APOSTOLAKIS: Redundant elements.

7 MEMBER DENNING: They're redundant  
8 elements.

9 MEMBER APOSTOLAKIS: Yes.

10 MR. FRUMKIN: I believe what they did is  
11 of these 24, they took out 10 of them that could when  
12 combined have an issue.

13 MEMBER APOSTOLAKIS: They are still  
14 located in the --

15 MEMBER DENNING: It could lead to  
16 problems.

17 MR. FRUMKIN: On this slide, they're  
18 independent.

19 MEMBER APOSTOLAKIS: Yes.

20 MR. FRUMKIN: But I think what we're going  
21 to do is we're going to try to take out that and look  
22 at them as pairs. So this is what we're going to do,  
23 form a bounding analysis to estimate the potential  
24 maximum CDF due to multiple spurious actuations for  
25 this typical older MPP, which I think is what the

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1 target, the goal is here.

2 And now we start getting into some  
3 formulas. Per pair, one hot short corresponds to  
4 train A and the other to train B. So that's how they  
5 were paired. And they appear in symmetrically paired  
6 cut sets.

7 So one cut set, the CDF of A -- and  
8 there's the formula for that -- and the CDF of B,  
9 which is the fire initiator, and then the hot short or  
10 random failure of one of the paired components and  
11 then the summation of the B. Okay?

12 CHAIRMAN WALLIS: And where do the  
13 multiple shorts come in?

14 MR. FRUMKIN: This is the formula for --

15 CHAIRMAN WALLIS: It's between two trains,  
16 but it's not multiple shorts in the same cable.

17 MR. FRUMKIN: That's correct, not in the  
18 same cable.

19 CHAIRMAN WALLIS: It's still independent.  
20 And this formula that you have here, the cut sets, are  
21 still assuming that the --

22 MR. FRUMKIN: I think so. They're not  
23 going to be independent of the same fire and the same  
24 damage time, but they're going to be independent  
25 failures affected by the same fire.

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1 MEMBER APOSTOLAKIS: Conditional on the  
2 fire.

3 MR. FRUMKIN: Conditional on the fire.

4 MEMBER SIEBER: Which assumes the fire  
5 covers both things.

6 MR. FRUMKIN: Right, which is a  
7 conservative assumption in this analysis.

8 MEMBER SIEBER: Truly conservative.

9 MR. FRUMKIN: Yes.

10 MEMBER SIEBER: Improbable.

11 MR. FRUMKIN: Well, it depends on the  
12 design of the plant, but yes, it's --

13 MEMBER APOSTOLAKIS: So if I want to  
14 couple them, then, I will assume that Fa and Fb are  
15 just F, one fire. Is that correct? And then I will  
16 have --

17 MEMBER DENNING: A is --

18 MEMBER APOSTOLAKIS: Otherwise they are  
19 still independent. I mean, the fire initiator must be  
20 the same.

21 MR. FRUMKIN: Well, let's just hope that  
22 your answer --

23 MEMBER APOSTOLAKIS: We assume two  
24 different fires.

25 MEMBER DENNING: We'll go to the next

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1 slide. And maybe it will become clear.

2 MEMBER SIEBER: It's a lot clearer in  
3 here.

4 MR. FRUMKIN: Okay. So, again, we have --

5 MEMBER APOSTOLAKIS: This .1 comes from?

6 MR. FRUMKIN: The .1 was the  
7 state-of-the-art when they did this PSA of --

8 MEMBER APOSTOLAKIS: I'll tell you where  
9 it comes from.

10 MR. FRUMKIN: Okay.

11 MEMBER APOSTOLAKIS: That's 20 years or so  
12 ago.

13 MEMBER DENNING: You're responsible for  
14 .1?

15 MEMBER APOSTOLAKIS: I saw it, and I said,  
16 "Well, gee. How did you come up with that?"

17 So they said, "Well, call this guy"  
18 somewhere in California.

19 I called this guy. He says, "Well, you  
20 know Sandia told us that."

21 "What Sandia?"

22 "This person."

23 So I called this person in Sandia. He  
24 says, "Well, I really don't know. It's this other  
25 guy."

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1           So I called this other guy. And he says,  
2 "You told us that."

3           (Laughter.)

4           MEMBER DENNING: So we're going to accept  
5 the .1.

6           MEMBER APOSTOLAKIS: It wasn't followed up  
7 at all. I mean, that was the funniest thing.

8           MR. FRUMKIN: The IPEEE assumed this hot  
9 short probability of .1. And then I believe we're  
10 doing a simplification of these factors here. And it  
11 actually gets very simple on the next slide, but if  
12 anyone really wants me to read through this, I can  
13 try.

14           MEMBER DENNING: You know what we'll do?  
15 Let's go to the bottom line.

16           MR. FRUMKIN: The bottom line.

17           MEMBER DENNING: And we'll have copies of  
18 this.

19           MR. FRUMKIN: Okay. Yes.

20           MEMBER DENNING: And we'll --

21           MR. FRUMKIN: Okay. This is, I believe --  
22 well, let's see.

23           MEMBER APOSTOLAKIS: No. This is --

24           MR. FRUMKIN: This is the bottom line  
25 here.

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1 MEMBER APOSTOLAKIS: Go back a little bit.

2 MR. FRUMKIN: I think --

3 MEMBER APOSTOLAKIS: This Fa plus Fb I  
4 don't understand. I thought it was going to be 1.5.

5 CHAIRMAN WALLIS: That's two fires, isn't  
6 it?

7 MEMBER APOSTOLAKIS: This is one or the  
8 other, yes, one or the other.

9 MR. FRUMKIN: Yes.

10 MEMBER APOSTOLAKIS: It doesn't really --  
11 I mean, he should have assumed one fire as far as I  
12 can tell. But, again, the --

13 MEMBER DENNING: We will look at it  
14 carefully.

15 MEMBER APOSTOLAKIS: -- connection is  
16 nothing, I mean, right?

17 MEMBER DENNING: We will look at it  
18 carefully later.

19 MR. FRUMKIN: Right. That would be a  
20 small difference.

21 MEMBER DENNING: And Ray's bottom line  
22 again is?

23 MR. FRUMKIN: Okay. Well, what he does  
24 here is he's taking out the  $1.1E^{-6}$ . And he's putting  
25 in this value or coming up with this value of .011,

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1 which is his surrogate simplification for all of the  
2 fires and his X factor, which is his fire and his  
3 failure factor.

4 MEMBER APOSTOLAKIS: He's bounding the  
5 random failures, right, by assuming a  $10^{-3}$ , right?

6 MR. FRUMKIN: I believe so.

7 MEMBER APOSTOLAKIS: Yes.

8 MR. FRUMKIN: Typical, right.

9 MEMBER APOSTOLAKIS: But he doesn't know  
10 how many -- oh, this is a bound on all random failures  
11 that are required.

12 MR. FRUMKIN: Yes.

13 MEMBER DENNING: Continue. Let's see.

14 MR. FRUMKIN: Okay. And now he's talking  
15 about the dual failures. Any of the ten paired hot  
16 shorts would appear in the cut sets. And Fa is the S,  
17 which is your severity factor, which going to reduce  
18 your likelihood of more hot shorts, which is the  
19 likelihood of having a big fire that's going to cause  
20 this damage.

21 CHAIRMAN WALLIS: Which affects both  
22 trains?

23 MR. FRUMKIN: Right. And then your  
24 various factors, A hot, B hot short, and then your  
25 random factors.

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1 MEMBER APOSTOLAKIS: Why square? Why A  
2 hot times A hot? It still assumes that they're  
3 independent events, right?

4 CHAIRMAN WALLIS: Well, that is the A hot  
5 times B hot --

6 MEMBER DENNING: It is going to take us  
7 some time to really work through this. Rather than do  
8 this here, --

9 MR. FRUMKIN: Okay.

10 MEMBER DENNING: -- let's go see Ray's  
11 bottom line.

12 MR. FRUMKIN: Okay. The bottom line is  
13 here.

14 MEMBER APOSTOLAKIS: All right.

15 MR. FRUMKIN: So for his choice of fires,  
16 for severity factor, I think he used a .1 for this  
17 extreme fire, which is an S.

18 CHAIRMAN WALLIS: Why is .1 extreme? It  
19 could be .5.

20 MR. FRUMKIN: Oh, no, no, no. This is for  
21 the likelihood of a large fire.

22 CHAIRMAN WALLIS: Yes. But just asking  
23 George Apostolakis by telephone tag --

24 MR. FRUMKIN: Oh, no. This is not his .1.

25 CHAIRMAN WALLIS: I thought it was his .1.

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1 MR. FRUMKIN: It's somebody else's .1.

2 MEMBER APOSTOLAKIS: This is from one of  
3 my students.

4 MR. FRUMKIN: That's right. Right. This  
5 .1 is from very likely the fire protection STP, which  
6 says that severe fires happen or ten percent of all  
7 fires that happen are severe, which is, again, a  
8 conservative number based on the state-of-the-art,  
9 which is the 6850 analysis.

10 But that's what we're doing with -- I  
11 mean, this is no question about it. This is a  
12 bounding analysis.

13 CHAIRMAN WALLIS: The ones that cause hot  
14 shorts?

15 MR. FRUMKIN: No. Instead of using a  
16 severity factor of one, assuming that all fires will  
17 cause the damage, we're only assuming that ten percent  
18 of the fires will cause the damage to cause hot short.  
19 So there are many different ways of severity --

20 MEMBER APOSTOLAKIS: So this .011, .011,  
21 is the frequency of fire or, no, this is from the  
22 random failure?

23 MR. FRUMKIN: Right.

24 MEMBER APOSTOLAKIS: According to one is  
25 one?

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1 MR. FRUMKIN: That's the severity factor.

2 MEMBER APOSTOLAKIS: What is the frequency  
3 of fire?

4 MR. FRUMKIN: What I believe he has done  
5 is I believe he has back-calculated through his  
6 simplification that .1 that he used. And he's turned  
7 that, the whole -- all of his important measures into  
8 this .011.

9 MEMBER APOSTOLAKIS: So that includes the  
10 frequency of fire?

11 MR. FRUMKIN: I believe so.

12 MEMBER APOSTOLAKIS: That's a pretty high  
13 number.

14 MR. FRUMKIN: Yes.

15 MEMBER DENNING: We are going to look at  
16 this carefully, but his bottom line is saying, well,  
17 what this could do in this particular case is it could  
18 have increased by a factor of three the fire damage  
19 frequency.

20 MR. FRUMKIN: I think what he's trying to  
21 say here is that when he back-calculates from his  
22 importance measures and then he combines these pairs,  
23 that -- and this is the bottom line here -- he can  
24 have a maximum of  $10^{-4}$  per year due to these pairs of  
25 hot shorts.

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1 MEMBER DENNING: And without it, they had  
2 3 times  $10^{-5}$  is what this plant did.

3 MR. FRUMKIN: Yes. That's the whole fire  
4 risk for the plant, is 3 times  $10^{-5}$ . So this could be  
5 dominating.

6 MEMBER APOSTOLAKIS: But why couldn't you  
7 go to an actual PRA and fix, instead of whatever they  
8 had, and see what happens, rather than doing this  
9 undue analysis? I mean, there are detailed fire PRAs  
10 out there.

11 MR. FRUMKIN: We don't actually have one  
12 in the office. He did have this information available  
13 to him.

14 MEMBER DENNING: What I would like to do  
15 is we would definitely like copies. Don't go  
16 anywhere.

17 MR. FRUMKIN: Okay.

18 MEMBER DENNING: And I don't think you  
19 have to read that. What we would like -- I mean, you  
20 can actually --

21 MR. FRUMKIN: Well, here his last slide is  
22 at least for a typical older nuclear power plant, one  
23 cannot a priori dismiss multiple hot shorts of being  
24 of lower significance.

25 MEMBER DENNING: Okay.

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1 MEMBER APOSTOLAKIS: Well, I would like to  
2 see the paper, please. No, no. Give me a copy.

3 MEMBER DENNING: Right. Yes, if we may.  
4 What we would like to do now is we would like to hear  
5 now from NEI, if we could. Don't run away, Research.

6 MEMBER APOSTOLAKIS: Don't anybody go  
7 away.

8 MEMBER DENNING: Don't anybody leave town  
9 other than me, but I would definitely like to make  
10 sure we have plenty of time to hear from NEI.

11 MEMBER APOSTOLAKIS: That's what I call  
12 running and meeting with --

13 MEMBER DENNING: The policeman is asked to  
14 lock the doors.

15 MEMBER APOSTOLAKIS: We have a cop  
16 outside?

17 MEMBER DENNING: And, Alex, you don't have  
18 handouts, but we can make them. Is that a true  
19 statement?

20 MR. MARRION: No, I do not have handouts.  
21 I do have a couple of comments.

22 MEMBER DENNING: You have comments?

23 MR. MARRION: Yes.

24 MEMBER DENNING: But you don't have any  
25 papers?

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1 MR. MARRION: No.

2 MEMBER DENNING: Okay. Please proceed.

3 MR. MARRION: Good morning. My name is  
4 Alex Marrion. I am a Senior Director of Engineering  
5 at NEI, and I appreciate the opportunity to offer a  
6 couple of comments on our perspectives on what we  
7 heard this morning.

8 Before I begin, I want to point out that  
9 we have two utility representatives, one from Progress  
10 Energy and one from Duke Power, who represent the two  
11 pilot plants for the application of NFPA 805.

12 And if the Committee so desires, I think  
13 it may be useful for you to understand the  
14 implications of this generic letter on the NFPA 805  
15 risk-informed application process. And I'll defer to  
16 you to --

17 MEMBER DENNING: We so desire.

18 MR. MARRION: Okay. Very good. Now I'll  
19 ask them to step up when I finish my comments.

20 To get back to Dr. Apostolakis' --  
21 George's comment, --

22 (Laughter.)

23 MR. MARRION: -- the test protocol and the  
24 issue of having cables exposed in the flaming region,  
25 I don't have any direct knowledge of that discussion

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1 with the NRC staff at the time we developed the test  
2 protocol. This was the first I heard of it, but I'll  
3 look into it. And we'll try to get an answer to you  
4 at the end of the week.

5 I do want to make it clear that we believe  
6 the multiple spurious actuation is a new regulatory  
7 position that results in significant impact on utility  
8 licensees, not only on the Appendix R, the NUREG 0800  
9 plants but also on the NFPA 805 plants.

10 The impact is significant in that it  
11 changes the methodologies that the utilities have  
12 credited in their licensing basis over the last 20  
13 years. So the licensing basis has to change.

14 Now, with that, it's perfectly appropriate  
15 for the NRC to say, "There's new information that has  
16 been brought to bear on this topic. And we have a new  
17 position." That's fine. But the NRC must bear the  
18 burden of demonstrating the safety impact of that new  
19 position and do a regulatory analysis to substantiate  
20 it because of the significant implications on the  
21 utility licensee design basis.

22 That's straightforward, but one thing that  
23 this position does not take into account is the  
24 fundamental elements of defense-in-depth relative to  
25 fire protection. What I'm talking about is the

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1 actions that are taken by licensees in preventing  
2 fires from occurring and detecting a fire when it does  
3 occur, having systems and personnel to respond to the  
4 fire to mitigate the consequences of the fire,  
5 suppression and detection systems, and then ultimately  
6 recovering the plant to assure that you can get into  
7 a safe condition.

8 We understand there is value to looking at  
9 risk-informed approaches and changes and assumptions  
10 and evaluating them accordingly, but I would recommend  
11 that we not lose sight of the defense-in-depth  
12 concepts as we go through this process going forward.

13 This generic letter is another example of  
14 what is fundamentally flawed with fire protection  
15 regulations and has been a problem with fire  
16 protection regulations and the associated regulatory  
17 process over the last 25 or 35 years.

18 And by that, I mean we have a continuous  
19 evolution of NRC positions and expectations that are  
20 addressed in a somewhat informal manner. And by that,  
21 I mean use of generic communications to articulate  
22 regulatory positions is, quite frankly, inappropriate.

23 New regulatory positions should be  
24 evaluated in terms of safety impact or clearly  
25 demonstrating the compliance issue associated with

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1 that new position. Then that has to be made publicly  
2 available so that the licensees can understand what  
3 these new positions are and what the basis for the  
4 positions are.

5 Historically in fire protection, it's been  
6 a plant-specific fire protection engineer from the  
7 licensee to an NRC inspector agreement of what the  
8 understanding is relative to an interpretation. And  
9 that is the problem that we're trying to fix. That's  
10 why we are so firm in our comments going forward,  
11 because fundamentally, gentlemen, if we don't address  
12 or we don't identify resolution to the spurious  
13 actuation issue today, it will be an issue for the  
14 NFPA 805 plants.

15 Going to 805 does not provide a resolution  
16 to this issue today because there is no understood  
17 methodology that can address the staff's position. I  
18 want to make that very clear.

19 MEMBER APOSTOLAKIS: Is this the  
20 open-ended issue that we discussed earlier?

21 MR. MARRION: Yes, yes. The comments made  
22 about CRGR approval of this generic letter, as an  
23 external stakeholder, that essentially is meaningless  
24 to us, reason being we are not privy to any kind of  
25 disciplined process that is used by CRGR or anyone

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1 within the NRC that clearly demonstrates this is the  
2 basis for the safety concern or this is the basis for  
3 the compliance concern.

4 What we have seen over the years -- and  
5 this is another example -- where the preferred route  
6 appears to be, well, let's make it a compliance  
7 concern because we as a regulatory agency, the NRC,  
8 can interpret the regulations. We have the right to  
9 interpret the regulations, et cetera, which is fine,  
10 but let's put the interpretation on paper. Let's  
11 identify resolution path so we have a common  
12 understanding going forward. We don't have that today  
13 on this particular issue.

14 Lastly, I would like to say that there  
15 isn't a generic letter that is simply a request for  
16 information. It should be clear from the discussion  
17 this morning that this generic letter basically  
18 imposes a new regulatory requirement that has  
19 significant impact on the licensing basis of current  
20 plants. That is not a request for information.

21 Those are the comments that I wanted to  
22 make this morning. I don't know if you have any  
23 questions on anything I said.

24 MEMBER DENNING: Yes, we do have some.  
25 One of them has to do with the timing, the 90 days,

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1 and the timing required to do the kind of analysis  
2 that's being requested there. Do you have a feeling  
3 as to what an appropriate time would be?

4 I mean, there's a timing that says, are  
5 you in compliance with this, which, regardless of this  
6 question, whether it's a new regulation or an old,  
7 there's no question the plant can determine that  
8 fairly quickly. But doing the entire analysis and  
9 determining what affected SSCs are, do you have any  
10 indication from the plants as to how much time that  
11 might take and what an appropriate time frame would be  
12 for a response like --

13 MR. MARRION: I don't have the information  
14 to answer the question, but I would submit that the  
15 next two individuals may be able --

16 MEMBER DENNING: May be of help on it?

17 MR. MARRION: -- to give you their  
18 perspectives.

19 MEMBER DENNING: Okay. Good.

20 MEMBER MAYNARD: Could I just --

21 MEMBER DENNING: Yes?

22 MEMBER MAYNARD: Your perspective comment  
23 was made that if the generic letter is not issued,  
24 then it would just have to be dealt with in inspection  
25 space. Do you have any comment on that?

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1 MR. MARRION: It is being dealt with in  
2 inspection space. Now, what we don't have is an  
3 external stakeholder. When I mention "we," I'm  
4 speaking of NEI and the industry. What is the safety  
5 case or what is the compliance case? And we haven't  
6 seen evidence of that clearly demonstrated that NRC  
7 action in this particular area is necessary in an  
8 expedited manner.

9 VICE CHAIRMAN SHACK: Just to address your  
10 methodology question, apparently you can deal with  
11 multiple actions if they come sequentially. So you  
12 have a methodology for that. And you're arguing that  
13 there isn't a methodology.

14 So it isn't necessarily the open-endedness  
15 of it that's the problem?

16 MR. MARRION: There isn't a methodology  
17 for addressing all spurious actuations in a given  
18 fire. Utilities had --

19 VICE CHAIRMAN SHACK: You can address them  
20 one at a time.

21 MR. MARRION: You can address them one at  
22 a time. And I would ask that the two utility  
23 representatives explain their methodology for circuit  
24 analysis. I think we would find that very insightful.

25 MEMBER DENNING: Good.

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1 MR. MARRION: But it's changed. And then  
2 what I would like to do is ask Dave Miskiewicz from  
3 Progress Energy and Harry Barrett from Duke Power.

4 CHAIRMAN WALLIS: I would bring up the  
5 point before you leave --

6 MR. MARRION: Yes?

7 CHAIRMAN WALLIS: You talked about the  
8 role of a generic letter and whether it just requests  
9 information. We have another generic letter on sumps,  
10 which you may be aware of, right?

11 MR. MARRION: I am generally aware of that  
12 one.

13 CHAIRMAN WALLIS: It not only requested  
14 information. It requested analysis, and it requested  
15 plans. And, in fact, it's resulted in large changes  
16 in the plant by a result of a generic letter.

17 MR. MARRION: Yes.

18 CHAIRMAN WALLIS: So it's not as if this  
19 is a unique generic letter, which is actually asking  
20 plants to do much more than just supply information.

21 MR. MARRION: My only point is a request  
22 for information as this generic letter is  
23 characterized as a mischaracterization of what its  
24 impact is.

25 CHAIRMAN WALLIS: Well, it clearly isn't

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1 that. I mean, it says a request for information and  
2 taking additional actions. I mean, the sentence asks  
3 for more than just information.

4 MR. MARRION: Okay?

5 MEMBER DENNING: Okay. Let's have our  
6 visitors come up.

7 MR. FRUMKIN: If I could add? This is Dan  
8 Frumkin. Just one point. The inspections started  
9 again in January of 2005, but there is still currently  
10 enforcement discretion for all circuit findings. And  
11 so there may be a perception that this has not turned  
12 into an issue yet because of a lack of enforcement in  
13 this area.

14 So starting in September 2006, enforcement  
15 will proceed for plants that do not have enforcement  
16 discretion under NFPA 805. So I just want to put that  
17 out there that currently there are no enforcement  
18 actions in this area for plants that take compensatory  
19 measures and have correction action plans.

20 MEMBER DENNING: Introduce yourselves,  
21 please.

22 MR. BARRETT: Good morning. My name is  
23 Harry Barrett. I work at Duke Power. I'm the  
24 three-site lead for NFPA 805 transition for all three  
25 of these sites in Duke Power's nuclear fleets. I just

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1 wanted to say a few words about the multiple spurious  
2 issue as it affects 805.

3           Although 805 is a risk-informed,  
4 performance-based rule, it is based on your current  
5 licensing basis going forward. And if that is  
6 questionable, then your regulatory foundation that  
7 you're billing it on would be questionable in 805,  
8 which ends up leading to a lot more effort and a lot  
9 more analysis required for that.

10           So this multiple spurious issue is adding  
11 a significant amount of paperwork and analysis to 805  
12 transition. The original concept was you would take  
13 your fire protection licensing basis, map it over to  
14 the 805 requirements, and it was pretty much just a  
15 paper transition.

16           With this new multiple spurious and the  
17 complications that that adds to the fire PRA, we're  
18 looking at a significant amount of engineering effort  
19 that goes into that.

20           It's going to take us over two years to do  
21 the transition for Oconee, which is the first plant.  
22 And a lot of that, most of that, is the PRA in the  
23 multiple spurious issue.

24           MEMBER APOSTOLAKIS: Do you agree that it  
25 is an issue?

1 MR. BARRETT: I agree that it needs to be  
2 looked at. I have not seen a multiple spurious  
3 scenario that is risk-significant yet.

4 MEMBER APOSTOLAKIS: Do any of your plant  
5 have a detailed fire PRA?

6 MR. BARRETT: We have a fire PRA. We have  
7 --

8 MEMBER APOSTOLAKIS: Not IPEEE, though?

9 MR. BARRETT: We had an early '80s vintage  
10 fire PRA, but we are putting together a NUREG 6850,  
11 the new version of it.

12 MEMBER APOSTOLAKIS: Okay. So --

13 MR. BARRETT: We're doing that now.

14 MEMBER APOSTOLAKIS: It would be, then,  
15 possible for you to go back to that PRA and see what  
16 happens if you assume multiple --

17 MR. BARRETT: It assumed multiple in the  
18 original analysis. To use the core melt, we needed to  
19 use multiples for that particular analysis. So it  
20 included --

21 MEMBER APOSTOLAKIS: The number came out  
22 okay?

23 MR. BARRETT: It came out relatively high.  
24 I don't remember the exact number, but fire was a  
25 fairly significant contributor to risk in the --

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1 MEMBER APOSTOLAKIS: Not fire overall,  
2 but, I mean, this particular mode with --

3 MR. BARRETT: Spurious?

4 MEMBER APOSTOLAKIS: Yes.

5 MR. BARRETT: If I remember right, many of  
6 the combinations that we analyzed were within the  
7 bounds of the Appendix R analysis originally for  
8 control room evacuation. The main fire area that we  
9 got into trouble with the IPEEE or the fire PRA, the  
10 original one, was in our cable shaft going up to the  
11 control room, where we had just about every cable in  
12 the plant going through one area. And so --

13 MEMBER APOSTOLAKIS: It seems to me that  
14 --

15 CHAIRMAN WALLIS: Did you assume multiple  
16 spurious actuations, simultaneous, and all of this?

17 MR. BARRETT: In that particular PRA, we  
18 ended up having to go to multiple spurious actuations  
19 in order to get the core damage.

20 CHAIRMAN WALLIS: Okay. Including  
21 simultaneous actuations.

22 MEMBER APOSTOLAKIS: So it would be  
23 interesting, then, to compare your numbers and  
24 analysis with the bounding analysis that the NRC staff  
25 has done to see which one makes sense.

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1 I mean, it seems that we do have a body of  
2 knowledge there that at least I as a member of this  
3 Committee don't seem to have access to. I don't know  
4 whether the rest of the members are familiar with it,  
5 but I doubt it.

6 So, I mean, it would be nice to see that,  
7 especially since you have done it already, I mean.

8 MR. BARRETT: Yes. The original analysis  
9 was nowhere the rigor that 6850 requires now.

10 MEMBER APOSTOLAKIS: I understand that.  
11 I mean, you --

12 MEMBER SIEBER: It is just one plant. So  
13 it's not clear to me how you can extend that to some  
14 --

15 MEMBER APOSTOLAKIS: Yes. But it provides  
16 a basis for judging what Ray Gallucci did.

17 MEMBER SIEBER: It gives you an idea.

18 MEMBER APOSTOLAKIS: Yes. And also what  
19 kind of effort it takes to do it because under NFPA  
20 805, it seems to me that if you find -- as I recall.  
21 Maybe I'm wrong. As I recall, you're right. You're  
22 supposed to meet the regulations, but if you don't  
23 meet some of them, then you can argue in risk space.

24 MR. BARRETT: Right.

25 MEMBER APOSTOLAKIS: Right?

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1 MR. BARRETT: Right.

2 MEMBER SIEBER: You don't need to.

3 MEMBER APOSTOLAKIS: But you don't need to  
4 go back and comply. So, I mean, there is a way out of  
5 it depending on the quality of the risk assessment.

6 MEMBER SIEBER: That would be a basis for  
7 an exemption, but you can't just sit there and do  
8 nothing.

9 MEMBER APOSTOLAKIS: But is that  
10 consistent with a statement that it does a lot of  
11 work, paperwork? I mean, if you already have the PRA,  
12 why does it add a lot of work? But you just said  
13 that, right?

14 I'm sorry. I don't remember your name.

15 MR. BARRETT: Harry.

16 MEMBER SIEBER: The PRA is not  
17 state-of-the-art.

18 MR. BARRETT: Right. The original PRA is  
19 not state-of-the-art.

20 MEMBER SIEBER: They have to do the work.

21 MR. BARRETT: The one that they are doing  
22 now is state-of-the-art. They're using 6850 and --

23 MEMBER APOSTOLAKIS: When do you expect it  
24 to be completed?

25 MR. BARRETT: It should be complete by

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1 probably June of next year.

2 VICE CHAIRMAN SHACK: When you do your  
3 state-of-the-art PRA, you're going to consider  
4 multiple actuations, right?

5 MR. BARRETT: Yes.

6 MEMBER APOSTOLAKIS: Yes. So, I mean, is  
7 it clear to everyone? I mean --

8 MR. BARRETT: We are taking significant  
9 efforts to make sure we get our best chance at finding  
10 those multiple spurious risk --

11 VICE CHAIRMAN SHACK: But it seems to me  
12 that anybody doing a fire PRA is going to have to  
13 consider multiple --

14 MEMBER DENNING: Do they have to consider  
15 them as comprehensively as here? Because they will  
16 have screening criteria. And I guess can you tell me  
17 if you weren't -- you know, suppose you were not  
18 heading towards that.

19 If you are sitting there and you had to do  
20 this analysis, how long would it take you to do this  
21 analysis? And how difficult would it be to -- would  
22 you have to modify the plant to be able to accommodate  
23 it?

24 MR. BARRETT: I am not sure about that.  
25 What we would probably end up doing is using the

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1 guidance in NEI-0001, chapter 4, which is the risk  
2 analysis piece of that, which is, in essence, doing a  
3 mini PRA for the --

4 MEMBER DENNING: But you're not allowed to  
5 use that. I mean, by this generic letter, you're only  
6 allowed to do that if you're then going to look for  
7 exemptions.

8 MR. BARRETT: Right, yes. You're not  
9 doing 805. That's your only other --

10 MEMBER DENNING: Yes.

11 MR. BARRETT: I mean, you need to modify  
12 the plant or you --

13 MEMBER DENNING: Modify the plant. How  
14 long would it take you to do that analysis in --

15 MR. BARRETT: Guessing, I would say  
16 probably a year.

17 MEMBER DENNING: Probably a year. I mean,  
18 what is in here says 90 days.

19 MR. BARRETT: No way.

20 MEMBER DENNING: There's no way?

21 MR. BARRETT: No way.

22 MEMBER DENNING: You would think that --

23 MEMBER SIEBER: Well, you can tell in 90  
24 days roughly how long you think it's going to take you  
25 to do it.

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1 MEMBER DENNING: Absolutely.

2 MEMBER SIEBER: But that's not what  
3 they're asking.

4 MEMBER DENNING: But that's not what  
5 they're asking.

6 MR. BARRETT: I mean, your choices are to  
7 take your safe shutdown analysis and just say that  
8 everything in a given fire areas fails immediately.

9 MEMBER SIEBER: That is the way you used  
10 to do it.

11 MR. BARRETT: And you can't do it.

12 MEMBER SIEBER: No.

13 MR. BARRETT: I mean, with the acceptance  
14 criteria you have in Appendix R, having water level go  
15 out of the pressurizer, you can do that with just a  
16 couple of spurious actuations. If you do all of them,  
17 you're never going to make it. So I don't know how  
18 you do that in 90 days.

19 MR. WOLFGANG: This is Bob Wolfgang with  
20 again --

21 MEMBER DENNING: Go ahead, Bob.

22 MR. WOLFGANG: The 90 days, what we have  
23 currently in the generic letter is for functionality  
24 assessment. To submit any exemption requests,  
25 amendment requests, that's the six-month period.

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1 MEMBER DENNING: Yes, but what I am  
2 missing is to do the functionality assessment, don't  
3 you have to do basically the analysis?

4 MR. BARRETT: Yes. That is essentially an  
5 operability assessment. Are components operable? In  
6 order to know that, you have to do the analysis to  
7 know what gets damaged and when. There's no way  
8 you're going to do that in a short time, no way.

9 MEMBER DENNING: Dave, did you want to  
10 make some comments?

11 MEMBER SIEBER: Before we switch, one  
12 thing that you said that I think is important is you  
13 really can't get the core damage unless you have  
14 multiple spurious actuations.

15 MR. BARRETT: We have some singles that  
16 get us in trouble, and we're going to have to fix  
17 those. But as far as getting into the core damage,  
18 I'm not even sure --

19 MEMBER SIEBER: This would be opposing  
20 trains, too, right?

21 MR. BARRETT: Well --

22 MEMBER SIEBER: Train A, train B pairs.

23 MR. BARRETT: By the fire PRA methodology,  
24 you're really not even worrying about 3G2 or 3G3  
25 anymore. You're looking at fires anywhere and damage

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1 to all of the circuits.

2 MEMBER SIEBER: Right.

3 MR. BARRETT: So you're really looking at  
4 controlling fires and cable room fires and all of  
5 that. And, you know --

6 MEMBER SIEBER: But if you were to make  
7 the assumption that you only have one spurious  
8 actuation, you wouldn't get the core damage. And you  
9 could just say, "I don't need to do anything," right?

10 MEMBER APOSTOLAKIS: Well, it depends on  
11 what else fails.

12 MR. BARRETT: Yes. I think it depends  
13 largely on --

14 MEMBER SIEBER: It would be an on-fire --

15 MR. BARRETT: -- what other failures --

16 MEMBER SIEBER: -- a non-fire-induced  
17 failure, right?

18 MEMBER DENNING: There has to be a core  
19 damage frequency, though. I mean, when you said you  
20 wouldn't get core damage frequency with a single  
21 failure, you have to because you have other unrelated,  
22 but it's just very low.

23 MR. BARRETT: Also we are talking hot  
24 shorts here, but you also have fire-related damage,  
25 which takes the component out of service, which is not

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1 included in that spurious operation probability.

2 So it's a much more complicated things to  
3 get your arms around as far as loss of all electrical  
4 power, loss of indication, and all of that. It's more  
5 than that.

6 MEMBER DENNING: Yes?

7 MEMBER SIEBER: Thanks.

8 MEMBER DENNING: Dave?

9 MR. WOLFGANG: Excuse me.

10 MEMBER DENNING: Yes?

11 MR. WOLFGANG: This is Bob Wolfgang again.

12 So Duke's response to this generic letter  
13 would be we're addressing it. We're transition to  
14 NFPA 805. And we're going to address multiple  
15 spurious actuations in that transition.

16 MR. BARRETT: Yes, sir.

17 MR. WOLFGANG: And that is the total  
18 response we're looking for from --

19 MR. BARRETT: We will give you a schedule  
20 of when we think that will be done, yes.

21 MEMBER DENNING: Okay. If that is what  
22 you are asking for, you're going to have to change the  
23 generic letter.

24 MR. BARRETT: No.

25 MEMBER DENNING: My interpretation. Well,

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1 we'll look at that.

2 Dave, why don't you go ahead and say a few  
3 words?

4 MR. MISKIEWICZ: Okay. My name is Dave  
5 Miskiewicz. I'm from Progress Energy. I'm the lead  
6 PRA supporting the transition to 805 at all of our  
7 units.

8 MEMBER APOSTOLAKIS: PRA?

9 MR. MISKIEWICZ: I'm the lead PRA engineer  
10 supporting our transition.

11 MEMBER APOSTOLAKIS: I thought you said  
12 "elite."

13 (Laughter.)

14 MR. MISKIEWICZ: That does sound good.

15 A lot of the discussion I'm hearing, my  
16 perspective is probably a little bit different than  
17 the normal compliance.

18 MEMBER APOSTOLAKIS: That's why we want  
19 it.

20 MR. MISKIEWICZ: You know, there is  
21 uncertainty. And I am used to dealing with the  
22 uncertainty as how much probability I can assign to  
23 something, can I take credit for these actions and all  
24 the various things on there.

25 One of the things that strikes me is when

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1 I look at the bounding analysis and it seems like  
2 we're trying to get the best of both worlds. We want  
3 to address everything in totality and also assure that  
4 we don't have that risk.

5 You know, when I deal with traditional  
6 design basis, we are allowed one single failure. And  
7 we assume no off-site power. And we give an  
8 initiating event that happens, and that is a given.

9 PRA, we will look at multiple failures.  
10 And we may find things that are more vulnerable that  
11 weren't even addressed under compliance. And I see  
12 kind of a similar thing here except for instead of  
13 saying, "Address a single failure," we're looking at  
14 "You've got to find them all."

15 And that just seems like an impossible  
16 task. Even in the PRA world, we can model a lot of  
17 stuff, but we're still not going to get them all. But  
18 we try to find the significant things. We're trying  
19 to gear down to get the significant issues.

20 As far as the workload goes that I see on  
21 the generic letter, I think it would be significant.  
22 I'm not the circuit analysis person but when I start  
23 throwing in non-currently credited equipment into that  
24 list that I want circuits routed for and cables routed  
25 for, it is a big workload for the electrical guys who

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1 are going to be doing that work. And I would see that  
2 as a resource drain on the overall transition effort  
3 for me.

4 In fact, if I saw them, you know, all of  
5 a sudden, focusing on one area and not another area,  
6 I'm not even sure how they would be able to get all of  
7 them without doing the PRA perspective.

8 MEMBER APOSTOLAKIS: I am a little bit --  
9 I don't know what the right word is, but we keep  
10 talking about the workload. It seems to me we should  
11 be talking about the real issue.

12 Is there a real issue here? Is there a  
13 contributor to risk that we have not handled in the  
14 past or managed well? I mean, the workload I'm sure  
15 you will agree, too, it's a major contributor to risk.  
16 We have to do something about it.

17 MR. MISKIEWICZ: I agree.

18 MEMBER APOSTOLAKIS: And, you know, the  
19 thing that made me happy with Duke is that they are  
20 doing the PRA. They will consider the multiple hot  
21 shorts or spurious situations. Is your company doing  
22 something similar or --

23 MR. MISKIEWICZ: We are doing the PRA.  
24 And we're going to in the PRA model the hot shorts,  
25 the spurious actuations.

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1 MEMBER APOSTOLAKIS: According to the  
2 latest information we have and everything?

3 MR. MISKIEWICZ: When we say important,  
4 too, it's almost, you know --

5 MEMBER APOSTOLAKIS: You're not going to  
6 use .1? You're going to use .6, for example?

7 MR. MISKIEWICZ: We'll use whatever the  
8 methodology recommends.

9 MEMBER BONACA: You can go to Professor  
10 Apostolakis if you remember.

11 MEMBER APOSTOLAKIS: Give me a call. I'll  
12 tell you.

13 (Laughter.)

14 MR. MISKIEWICZ: It's .1. And we're  
15 working through those issues, but even doing that is  
16 going to be limited somewhat. You know, there are  
17 screening techniques and things used that we're going  
18 to work our way through as to which circuits really  
19 need to be evaluated.

20 MEMBER DENNING: Do you think the approach  
21 is clearly defined as to how you come up with a  
22 probability for these actuations?

23 MR. MISKIEWICZ: Right.

24 MEMBER DENNING: There is some randomness  
25 that one assumes in terms of which circuits can

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1 connect with which other circuits to --

2 MR. MISKIEWICZ: I think what we know now  
3 is better than what we knew ten years ago when we were  
4 dealing with this.

5 MEMBER DENNING: Yes. But it isn't  
6 obvious to me even what the best approach is to doing  
7 that within the fire PRA, let alone deterministically.

8 MEMBER APOSTOLAKIS: So the position,  
9 then, of at least you two gentlemen and maybe the  
10 industry is that this generic letter is unnecessary,  
11 that you are handling the issue of multiple spurious  
12 actuations via the PRA and as you transition to it --  
13 are you transitioning to 805?

14 MR. MISKIEWICZ: Yes, we are.

15 MEMBER APOSTOLAKIS: As you transition to  
16 805, you may have to come back to the NRC and, using  
17 risk arguments, request an exemption of some sort. Is  
18 that your position?

19 MEMBER BONACA: Well, I heard it  
20 differently.

21 MEMBER APOSTOLAKIS: What?

22 MEMBER BONACA: I heard it differently.  
23 I heard simply that the burden should be on the NRC to  
24 perform. Okay.

25 MEMBER APOSTOLAKIS: But they are handling

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1 it already.

2 MEMBER BONACA: Yes.

3 MR. BARRETT: We are handling multiple  
4 spurious in the PRA as part of the 805 transition.

5 MEMBER APOSTOLAKIS: And then what?

6 MR. BARRETT: And then we're going to  
7 follow the industry guidance and the regulatory  
8 guidance provided by the NRC. And depending upon  
9 where the thresholds fall in relation to the  
10 self-approval thresholds, if it's less than the  
11 self-approval threshold, then we'll end up  
12 self-approving an exemption in accordance with the NRC  
13 rules for 805 implementation.

14 MEMBER APOSTOLAKIS: Right, right.

15 MR. BARRETT: If it's over that threshold,  
16 then we'll end up having to --

17 MEMBER APOSTOLAKIS: Come back.

18 MR. BARRETT: -- contact the staff and  
19 work out whether we have to modify or whether we can  
20 leave the situation as is.

21 MEMBER APOSTOLAKIS: The conclusion one  
22 can draw from this is that you believe that this  
23 generic letter is unnecessary because there is already  
24 a process in place. Is that correct?

25 MR. BARRETT: For 805, for their plants.

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1 Not everyone is --

2 MEMBER APOSTOLAKIS: Why wouldn't another  
3 plant apply the same thing?

4 MEMBER SIEBER: It is an optional process.  
5 Some plants --

6 MEMBER APOSTOLAKIS: Oh, they don't --

7 MEMBER SIEBER: -- may decide not to do  
8 anything at all.

9 MEMBER APOSTOLAKIS: If they don't  
10 transition to 805, you mean?

11 MEMBER SIEBER: Yes.

12 MR. MARRION: If I may, Dr. Apostolakis,  
13 there are 40 plants that have submitted letters of  
14 intent to the NRC. The resolution of this issue for  
15 the 805 plans has yet to be determined. The approach  
16 is the use of the PRA, do the modeling -- all right?  
17 -- and then define that.

18 But that would be applicable to those 40  
19 plants. The other plants, the balance of the  
20 industry, have used any combination of the single  
21 failure to three or four failures.

22 You heard mention of NEI-001 that has the  
23 methodology, both -- two methodologies: deterministic  
24 and risk-informed. We piloted that at two plants.

25 And so we can't take credit for that

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1 anymore because of this new position with the generic  
2 letter. But I suspect that the solution will be had  
3 with the pilot exercise over the next several months  
4 to a year possibly and that that's the solution that  
5 needs to be evaluated for applicability to the non-805  
6 plants because, absent that, I don't see anyone coming  
7 up with a generic solution for the non-805 plants  
8 today. And it is going to be based upon PRA.

9 MR. MISKIEWICZ: Even in 805, though, when  
10 we do a fire PRA, there will be some iterative  
11 process. You know, we're dependent on the circuit  
12 analysis people giving us the information that we need  
13 to model. And so we're going to try to get risk to  
14 make sure we're modeling the right areas.

15 MEMBER SIEBER: Just the basic methodology  
16 of PRAs causes you to consider multiple spurious --

17 MR. MISKIEWICZ: If you model all of your  
18 singles and multiples from singles --

19 MEMBER SIEBER: That's the way it is.

20 MEMBER APOSTOLAKIS: But in the old days,  
21 in the first PRAs, I don't think we considered that.

22 MR. MISKIEWICZ: You modeled your singles.  
23 And they would combine in your results to give you  
24 multiples.

25 MEMBER SIEBER: Part of the process.

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1 MR. MISKIEWICZ: Yes. But you would still  
2 have to model the spurious event was a failure mode  
3 for that specific piece of equipment, --

4 MEMBER SIEBER: Right.

5 MR. MISKIEWICZ: -- which depends on the  
6 circuit analysis people telling you where that --

7 MEMBER SIEBER: So the philosophical  
8 discussion as to what the assumptions ought to be is  
9 sort of moot because the process of the PRA itself  
10 takes care of that if it's done thoroughly and done  
11 right.

12 MEMBER APOSTOLAKIS: One of the things  
13 that we don't do at this Committee is have  
14 presentations or briefings on the actual analysis that  
15 the industry is doing.

16 MEMBER SIEBER: Right.

17 MEMBER APOSTOLAKIS: I think that would be  
18 extremely beneficial to us if somehow we found a way  
19 to have the industry come and present a detailed PRA,  
20 fire PRA in this case. Anyway, that's a separate  
21 issue.

22 MEMBER DENNING: I think what we would  
23 like to do at this point is thank you gentlemen. And  
24 we may still ask you in the few minutes that we have  
25 left if we have some additional questions. We have

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1 the potential to hear about additional experimental  
2 work that could potentially change some perspectives,  
3 but I don't think we'll do that.

4 I think what we ought to do now is we  
5 would have some discussion while we still have the  
6 staff here and the industry here, we have some  
7 discussion? Would you agree, Graham, that we'll have  
8 some discussion here, see just kind of where we are  
9 sitting on this?

10 CHAIRMAN WALLIS: I was thinking about  
11 that. I think we certainly need discussion.

12 MEMBER SIEBER: Yes.

13 CHAIRMAN WALLIS: I think some of it needs  
14 to be in our working session, --

15 MEMBER DENNING: Yes.

16 CHAIRMAN WALLIS: -- rather than open  
17 session, but I think we can do some of it now. What  
18 little bit we can do now to clarify the situation  
19 certainly we should do now.

20 MEMBER ARMIJO: I have a question that may  
21 not be a discussion. Just in reading the staff's  
22 response to a lot of the comments received on the  
23 draft, there was reference to a lot of -- where is  
24 this thing, the screening tool, a risk screening tool,  
25 that the licensees develop a risk screening tool to be

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1 reviewed and approved by the staff.

2 This is a tool that would evaluate a  
3 variety of different multiple spurious actuations and  
4 sort them out and say, "These are the ones to worry  
5 about. And the rest we don't have to worry about."

6 What is your view? Does such a tool  
7 exist? Do you use such tools, both parties?

8 MR. MISKIEWICZ: We haven't kind of gotten  
9 to that step yet. I'm not exactly sure what the  
10 paragraph is you are referring to.

11 MEMBER ARMIJO: Yes. It's --

12 MR. MISKIEWICZ: But we can do  
13 sensitivities and say, "If I just fail the system, you  
14 know, a functional type of thing, if it's not  
15 significant, then I don't have to go down deeper and  
16 model all the individual spurious. I can screen it by  
17 saying it's not going to matter without doing the  
18 detailed modeling," you know.

19 MEMBER APOSTOLAKIS: The screening depends  
20 on a number of factors, this being one, but the other  
21 is the amount of fuel you have in your area, whether  
22 you can have a fire to begin with, the fire PRA.

23 MEMBER ARMIJO: I thought it was here is  
24 a large number of conductors that can cause spurious  
25 actuations of a large number of systems. And nobody

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1 has defined what scenarios are worrisome. It seems to  
2 me like it's a large number of mind-boggling barriers.  
3 And how do you sort those all?

4 MR. BARRETT: Let me address that.

5 MEMBER ARMIJO: Yes.

6 MR. BARRETT: One of the things that Duke  
7 has done -- and I think Progress is going to follow  
8 suit when they actually do their PRA -- is we have  
9 attempted to put our arms around the most significant  
10 multiples that we could think of by putting together  
11 an expert panel of people who know the plant, know the  
12 Appendix R design, no fire protection, and postulate  
13 these in an organized fashion, like going through  
14 PNIDs and plant design records to say, "All right.  
15 What are the real multiple spurious combinations that  
16 would really hurt me?" and capture those in scenarios  
17 so that they can be analyzed in detail in the fire PRA  
18 so that we can really look at the risk.

19 We're looking at it taking a three-pronged  
20 approach. We have the Appendix R analysis that says,  
21 "Here is all the safe shutdown stuff that I've got to  
22 have. Here are the cables and where they go in the  
23 plant. And then here is what gets damaged in each  
24 fire area."

25 And we take the expert panel. And we say,

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1 "Well, is there anything we missed? You know, is  
2 there something out there that because you end up  
3 flushing the toilet over here and you end up turning  
4 that light bulb on, the combination of things gets you  
5 something you didn't expect?" The expert panel is  
6 supposed to deal with that.

7 And then we also look at the PRA and true  
8 up all AOVs, true up all MOVs, and see if those kinds  
9 of things give us surprises that we didn't expect.  
10 Between the three of those, we think we're going to  
11 end up probably having 95 percent of the  
12 risk-significant scenarios.

13 MEMBER DENNING: For all of your plants,  
14 do you know where your cables are by tray?

15 MR. BARRETT: We didn't. We ended up  
16 having to pay to have that analysis done for us. I  
17 think it was originally determined in the '80s but was  
18 not captured in a database or anything. And we had to  
19 go back and --

20 MEMBER DENNING: But you had that for all  
21 your plants, do you?

22 MR. MISKIEWICZ: I wouldn't say all of the  
23 plants. That's a lot of work. In a lot of cases it's  
24 limited to the set of equipment that met the rule for  
25 the Appendix R compliance --

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1 MEMBER DENNING: It seems to say that --

2 MR. MISKIEWICZ: -- or our equipment that  
3 we want to credit from PRA perspective because there  
4 is risk-significant equipment in mitigation that is  
5 not within the scope of Appendix R right now. And  
6 that we'll add to the list. And some of those still  
7 need to be routed.

8 MEMBER DENNING: You do have additional  
9 cable routing that you would have to determine;  
10 whereas, you feel that you have already done the --

11 MR. BARRETT: There were some things in  
12 the PRA that we had not addressed in safe shutdown,  
13 and we're going to have to have --

14 MEMBER DENNING: Well, PRA is one thing.  
15 What about with this requirement? Does that change?  
16 Would you have to -- if this was imposed on you, do  
17 you think you have to do more cable tracing?

18 MR. BARRETT: What I'm talking about is  
19 our attempt to try to get our arms around all of the  
20 risk-significant scenarios.

21 MEMBER DENNING: Scenarios? Okay.

22 MR. BARRETT: So that's why we did the  
23 expert panel and all of that, to try to get our arms  
24 around things that we would have otherwise missed.

25 MEMBER DENNING: You keep saying

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1 "risk-significant." And we're in a space here where  
2 we're not necessarily risk-significant. It's broader  
3 than that.

4 MR. BARRETT: I think if you take all of  
5 the cables and you just fail them all and you say they  
6 all happen immediately, you're done.

7 MEMBER DENNING: You can't survive.

8 MR. BARRETT: Some of these areas you  
9 can't survive it.

10 MEMBER DENNING: Okay.

11 MEMBER SIEBER: On the other hand, from a  
12 risk standpoint, the set of cables that you have to  
13 know what the routing is becomes larger than the  
14 Appendix R set.

15 MR. BARRETT: Yes.

16 MEMBER SIEBER: But it is certainly not  
17 all of the cables. So there is going to be some  
18 physical work that has to be done if you don't have  
19 pull ticket. If you don't have the database, you  
20 can't --

21 VICE CHAIRMAN SHACK: In the NEI-001  
22 guidance, where, as I understand it, you do up to four  
23 failures, how do you select those four?

24 MR. BARRETT: A similar process with the  
25 expert panel and using Appendix R analysis, a similar

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1 process.

2 MR. FRUMKIN: This is Dan Frumkin from the  
3 staff.

4 One of the things that we have discovered  
5 about defining a failure is a lot of the analyses  
6 assume once spurious actuation, once spurious  
7 actuation, what the NEI or at least the risk, 2,403 --  
8 and I think NEI-001. They talk about multiple hot  
9 shorts.

10 Now, one pair of conductors coming  
11 together could cause numerous different spurious  
12 actuations. So I think that the staff and the --  
13 well, the staff has come out with 2,403 and has put it  
14 on the table.

15 We are looking for this hot short. That  
16 could cause whatever it could cause. We're not  
17 counting spurious actuations anymore. We're taking  
18 that hot short and saying, "Well, what could it  
19 cause?"

20 I think there was a situation where there  
21 was one cable or just a number, just a few conductors,  
22 or maybe it was even two conductors that could give an  
23 indication which could open all of 16 SRVs at one  
24 plant.

25 Now, a long time ago that might have been

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1 16 separate spurious actuations. And today we're  
2 looking at that as one pair of conductors coming  
3 together. And I think everybody is pretty much on the  
4 same page that yes, obviously if the circuits can  
5 cause all of those spurious actuations, we consider  
6 that.

7 MEMBER DENNING: Well, I guess a comment  
8 that I would have on generally what I have heard is  
9 that I think it's very clear that there are timing  
10 issues. If we go forward with the generic letter,  
11 then, at least in my interpretation of the generic  
12 letter, there are timing requirements that are not  
13 doable by the industry and that one would have to do  
14 some relaxation of that. And I don't see where just  
15 having the 30-day, where they can say, "It's going to  
16 take me longer as appropriate."

17 Now, it could be that maybe this should be  
18 more of an information-gathering generic letter,  
19 rather than one that is quite forcing the NRC's  
20 position about the need for multiple spurious  
21 actuations without a more relaxed position like NEI's.

22 I guess what I'm looking for are general  
23 comments as to people, where they are seemingly  
24 falling on this generic letter.

25 MEMBER MAYNARD: Well, I would agree with

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1 most of your comments there. First of all, I do  
2 believe that it clearly constitutes a backfit. We  
3 will get into some other things later on that, but we  
4 don't have to change regulations to be changing  
5 requirements. A change in staff position on what is  
6 acceptable for meeting a regulation, changing those  
7 position, also constitutes a backfit.

8 With that said, I would also like to say  
9 that this issue needs to be resolved. I think playing  
10 around too long about what is the right regulatory  
11 process isn't going to serve everybody's best interest  
12 either.

13 I think it is important. This issue has  
14 been around for 25 years. It needs to get resolved in  
15 an approach going forward as to what is it going to  
16 take to either make it go away as an issue or to  
17 actually fix it.

18 I think the 90 days, I think basically if  
19 it goes out the way it is, basically you're going to  
20 end up with everybody coming in with time request  
21 extensions. And so I don't think that's really the  
22 right thing to do there.

23 If it goes out the way it is, I think it  
24 needs to extend that time. I think it might be better  
25 to go out with what is truly an information request,

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1 to gather information to then be able to determine  
2 what the next steps are.

3 But, again, I don't think process should  
4 drag out for another 5 or 10 or 15, 20 years.  
5 Something needs to be done to put it on a resolution  
6 path.

7 VICE CHAIRMAN SHACK: Let me just come  
8 back to that for a second. I mean, we know what you  
9 expect from the 40 plants that are going for NFPA 805.  
10 What do you expect from the others?

11 MR. WOLFGANG: This is Bob Wolfgang again.

12 I think a number of them are going to come  
13 back and say, "We meet our licensing basis, and thank  
14 you very much. And good-bye."

15 MEMBER DENNING: Will they really say  
16 that? I mean, your --

17 MR. WOLFGANG: That is one thing.

18 VICE CHAIRMAN SHACK: Will you accept that  
19 answer?

20 MEMBER SIEBER: Send it over to  
21 enforcement.

22 MR. WOLFGANG: No. No, we won't. What we  
23 will hear from others is --

24 VICE CHAIRMAN SHACK: What would you  
25 consider an acceptable response from the others?

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1 MR. WOLFGANG: Well, "We don't address  
2 multiple spurious actuations. Here is our plan to  
3 address it to do" X, Y, Z. I don't know. "Do  
4 physical mods."

5 MEMBER DENNING: That's a six months'  
6 answer.

7 MR. WOLFGANG: Yes. That will be the  
8 six-month answer. But initially, yes, either you meet  
9 it or you don't meet it. We don't think we meet it.  
10 We think we meet it.

11 For the first round, that's all I think  
12 we're going to get.

13 MEMBER DENNING: Getting back to this  
14 backfit question, I'm not sure that ACRS is the  
15 appropriate one to answer that. Obviously it makes it  
16 easier for the regulatory staff if it's not a backfit  
17 question.

18 MEMBER BONACA: Yes. One thing that  
19 troubles me a little bit is, you know, is it a  
20 significant issue or is it not a significant issue?  
21 That's a plant-specific answer. And so we're not  
22 going to find out an answer to the question.

23 And I think that if we had to perform a  
24 generic evaluation to justify a backfit, I'm not sure  
25 that it could be done because, I mean, it's so

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1 specific to the plant, the age, to whatever the  
2 situation may be.

3 MEMBER DENNING: But this question of a  
4 specific issue, I think you can do a reduced analysis  
5 to determine. I think you can screen out stuff a  
6 priori --

7 MEMBER BONACA: I think so, too.

8 MEMBER DENNING: -- you know, so that it  
9 isn't such an onerous job to determine what's  
10 important and what's a potentially significant risk  
11 contributor here.

12 MEMBER BONACA: Clearly, I mean, something  
13 has to be done. I mean, we have new evidence in front  
14 of us. And I completely agree with you, Otto, that it  
15 can't wait. They have to be dealt with.

16 I think that, however, the industry needs  
17 more time to deal with this. They don't have a  
18 ready-made process by which they can screen this out  
19 and address it. So the issue is more the time.

20 Now, the next statement again, as reported  
21 to you, is the fact that we are not really the best  
22 charges of what is the most appropriate regulatory  
23 process to follow to go ahead with this.

24 MEMBER APOSTOLAKIS: Our job here is to  
25 judge the generic letter as presented to us.

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1 MEMBER BONACA: Yes.

2 CHAIRMAN WALLIS: I am just wondering how  
3 we add value to this. If we were a subcommittee, we  
4 might well say, "Look, we now know what the issues  
5 are. We think there must be a better way than having  
6 the agency send out this generic letter asking for  
7 things which may be impractical for some plants," but,  
8 then, there should be some way to work with the plants  
9 to figure out what is the right solution to this  
10 technical problem. I'm not sure.

11 We're also sort of a facilitator between  
12 industry and the agency, and that's not really our  
13 job, though, is it?

14 MEMBER SIEBER: Well, the other thing that  
15 is not our job is to try to figure out whether it's a  
16 backfit or not. That's a legal question.

17 CHAIRMAN WALLIS: Well, we don't even know  
18 how important it is because we don't have these proper  
19 risk analyses.

20 MEMBER DENNING: Well, having resolved  
21 these questions, I now turn it back to you, Mr.  
22 Chairman.

23 (Laughter.)

24 CHAIRMAN WALLIS: I can make a very  
25 decision, which is to take a break for lunch. We are

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1 going to be ethics-trained at 12:15. And then we go  
2 to work again at 1:30. Thank you very much for your  
3 presentations.

4 We'll take a break, and as a Committee,  
5 we're going to be back here, not on the transcripts or  
6 anything, for ethics training at 12:15. We'll start  
7 the official proceedings again at 1:30.

8 (Whereupon, a luncheon recess was taken  
9 at 11:33 a.m.)

A-F-T-E-R-N-O-O-N S-E-S-S-I-O-N

(1:33 p.m.)

CHAIRMAN WALLIS: Back into session. The next item on the agenda is another generic letter; first of all, underground cable failures that disable accident mitigation systems.

Our cognizant member is Mario Bonaca. I will hand over the meeting to him. Please go ahead, Mario.

MEMBER BONACA: Thank you, Mr. Chairman.

3) DRAFT FINAL GENERIC LETTER 2006-XX,

"INACCESSIBLE OR UNDERGROUND CABLE FAILURES THAT  
DISABLE ACCIDENT MITIGATION SYSTEMS"

3.1) REMARKS BY THE SUBCOMMITTEE CHAIRMAN

MEMBER BONACA: We have a presentation from the staff. They are proposing to issue a generic letter on inaccessible underground cable failures that disable accident mitigation systems.

We have recently become conversant with this issue through license renewal. You may remember that the GALL report requires for license renewal the existence of two programs: one, a program to detect the presence of water and the watering actions; and the other one is a program to test the cables and essentially-- so we are aware of the concern here.

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1 And the staff is now addressing this issue in the  
2 current licensing area.

3 And so, with that, I will turn to the  
4 staff. Mr. Mayfield?

5 3.2) BRIEFING BY AND DISCUSSIONS WITH  
6 REPRESENTATIVES OF THE NRC STAFF

7 MR. MAYFIELD: Good afternoon. I'm Mike  
8 Mayfield, the Director of the Division of Engineering.  
9 And my division is sponsoring this generic letter.

10 We're here this afternoon to seek ACRS  
11 endorsement to publish the generic letter. The  
12 generic letter, as Mr. Koshy will describe, provides  
13 some information to licensees on the significance of  
14 these potential failures, and seeks some information  
15 from licensees regarding the monitoring of these  
16 cables.

17 Tom Koshy from the Electrical Engineering  
18 Branch will make the presentation.

19 MR. KOSHY: Thank you, Mike.

20 As Dr. Bonaca mentioned to you, this was  
21 first brought to your attention as a problem during  
22 the license renewal hearing at the ACRS. The question  
23 was, is dewatering every ten years going to prevent  
24 the problem?

25 At that time, in light of the failures

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1 that we had noticed at the time, we thought of taking  
2 it as an operating reactor issue under Part 50. And  
3 we did some serious looking into see how big the  
4 problems are.

5 The safety concerns identified at the time  
6 were some of these underground and inaccessible cables  
7 supply power to some safety-related components. Using  
8 some examples here, the off-site power, the cable that  
9 brings the off-site power, to the safety buses.

10 The second would be the emergency diesel  
11 generator feeder. This is critical in those cases  
12 where the emergency diesel generator to building is  
13 physical apart from the main building so that the  
14 underground cables bring into power; and then the  
15 emergency service water pumps, these cases where the  
16 pump house is located again, you know, physically away  
17 from the plant so that the power supply to the service  
18 water pump has to go through underground cables.

19 And failure of one of these cables could  
20 affect multiple systems in these sense there could be  
21 a train, cooling off of safety systems, collectively  
22 influencing more than just one isolated system.

23 Most of these failures that we came across  
24 did not have any direct reference to having a  
25 qualification for this cable to withstand the moisture

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1 environment or, essentially, you know, in duct banks,  
2 if it is immersed in water, you know, can it  
3 withstand. That type of qualification had not been in  
4 existence for these cables that we came across.

5 MEMBER BONACA: Let me understand now,  
6 however. These are cables in safety-related  
7 applications?

8 MR. KOSHY: Yes.

9 MEMBER BONACA: Okay. So evidently on day  
10 one, when the plant was built, there was no  
11 expectation that the cable would be wetted?

12 MR. KOSHY: Yes. In fact, they thought it  
13 would stay relatively dry, but as duct banks develop  
14 cracks, you know, there would be traffic about it.  
15 And eventually these things crack. And depending on  
16 the water table, you know, it could be immersed for a  
17 long time or maybe a short time.

18 MEMBER BONACA: Well, in many cases, these  
19 cables are buried --

20 MR. KOSHY: Yes.

21 MEMBER BONACA: -- in the ground. So from  
22 day one, there was an expectation that they would see  
23 humidity and why we are not environmentally qualified.

24 MR. KOSHY: Either it was not specified at  
25 the time or they thought that, you know, the existing

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1 material at the time could withstand some level of  
2 moisture. For some reason, they did not specifically  
3 seek out.

4 The reason I stated that is, you know,  
5 much in the later period, now we have cables that can  
6 withstand such highly moist environment. In fact, I  
7 know of a case where they have run the cable to the  
8 river. That's for a --

9 CHAIRMAN WALLIS: But not forever.

10 MR. KOSHY: Excuse me?

11 CHAIRMAN WALLIS: Just because they are  
12 qualified doesn't mean they will survive forever in  
13 this environment.

14 MR. KOSHY: You are right, yes. Yes.  
15 They may not survive forever, but at least, you know,  
16 they have some demonstrated capability for a certain  
17 period that it can be even immersed in water and still  
18 do its function.

19 But all of that addresses, you know, the  
20 possibility that you need to know the condition of the  
21 insulation so that you have that confidence that it  
22 can do its function for the foreseeable future.

23 We went back into the history of the LERs  
24 that we have on record. We saw failure at 17 sites  
25 and cable replacements at 100 or so. And most of the

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1 faulty cables were not discovered until there was an  
2 operational failure.

3 Again, these are based on LERs, where the  
4 system has a redundant system or some reason, because  
5 of a plant trip or the failure was serious enough it  
6 prompted an LER.

7 MEMBER ARMIJO: What is your definition of  
8 a medium cable?

9 MR. KOSHY: 5 kV.

10 MEMBER ARMIJO: And above?

11 MR. KOSHY: 5 kV. Well, in the sense of  
12 when you go into 13 kV, you know, some people label it  
13 as medium also.

14 MEMBER ARMIJO: Okay.

15 CHAIRMAN WALLIS: High tension.

16 MEMBER SIEBER: Four-eighty volts to --

17 MR. KOSHY: Four-eighty will be below  
18 that. Yes. We will not call that medium, yes.

19 MEMBER SIEBER: Four-eighty is --

20 MEMBER BONACA: But you include those?

21 MR. KOSHY: Excuse me?

22 MEMBER BONACA: But you include those in  
23 the --

24 MR. KOSHY: Yes, we are including those  
25 because there are certain plants where the emergency

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1 diesel generator generates voltage at 480 and  
2 emergency service water and safety pumps are at 480  
3 volts, some small plants and early vintage.

4 MEMBER BONACA: Okay.

5 MR. KOSHY: So we wanted to include that  
6 also. That's why we went more than just medium  
7 voltage.

8 The EPRI data indicated about 65 cable  
9 failures. And later the white paper which NEI has  
10 submitted indicated about 55 failures for about 15  
11 plants.

12 Most of the cable failures have what in  
13 common? It's about 12 years of age. And the cable  
14 was subjected to some type of, you know, moisture  
15 environment, probably for a longer duration or a  
16 shorter duration. And these things were essentially  
17 common factors.

18 The cables, again, that we are focusing on  
19 is about roughly about six to eight cables, you know,  
20 depending on the design uniqueness, the cables that  
21 can have the most, let's say, significant impact on  
22 the plant.

23 MEMBER MAYNARD: The cable was about 12  
24 years old? You're saying that all of these failures  
25 were about the same age or --

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1 MR. KOSHY: No. More than that. There  
2 are some 20-plus.

3 MEMBER MAYNARD: Okay. All right.

4 MR. KOSHY: Yes.

5 CHAIRMAN WALLIS: It was at least 12 years  
6 old. At least 12 years. I was trying to figure it  
7 out. If it's every 12 years, that's pretty severe.

8 MR. KOSHY: You're right. Twelve and  
9 above. So in this generic letter, what we are  
10 focusing on is power cables that are within the scope  
11 of the maintenance rule, including cables connected to  
12 off-site power, emergency service water, and the other  
13 examples that I stated before, and those routed  
14 through underground or inaccessible locations, such as  
15 buried conduits, cable troughs, above-ground and  
16 underground. And these are the things that we are  
17 considering to be within the scope of this generic  
18 letter.

19 The benefits of this program are gaining  
20 confidence in the capability of the cable to respond  
21 to design bases events. To give you an example, at  
22 Turkey Point after the hurricane, the diesel had to  
23 run for about a week continuously. And thereafter for  
24 a month's period, the diesel had to come back on for  
25 other spurious power outages.

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1           So if you are looking into an accident  
2 where it has to be on a LOOP condition where these  
3 cables may need to be relied on for a few weeks. So  
4 we are not looking at a few hours of operation. The  
5 confidence needs to be gained for a period much higher  
6 than a few hours, which is usually the subject of our  
7 maintenance and surveillance activities.

8           MEMBER BONACA: Do you have examples of  
9 failures in service that were not exhibited during  
10 functional testing?

11           MR. KOSHY: What we have, the reported  
12 failures are a combination of both. Some in-service  
13 failures certain plants appear to have more than  
14 others. And others, when you start for surveillance,  
15 you find out that, you know, after a couple of hours,  
16 it fails.

17           So the LERs that we recorded are those  
18 cases where the plant impact was significant, so in  
19 the sense either operational. And if it is purely  
20 during a surveillance, we will not get an LER report  
21 on it.

22           So that's some of the problem that we are  
23 facing. The LERs that we received are so limited in  
24 number because, you know, it had to either bring a  
25 plant down or give an easy access situation for us to

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1 plant an LER report.

2 So that's why we are focusing on getting  
3 a handle on the extent of failures so we can engage  
4 them and see what other actions would be necessary.

5 CHAIRMAN WALLIS: Could you explain  
6 something to me?

7 MR. KOSHY: Yes.

8 CHAIRMAN WALLIS: I can understand  
9 off-site power sort of coming in on the underground  
10 cable. Why is diesel generator? Why does the diesel  
11 generator have underground cables? Is it part of the  
12 plant?

13 MR. KOSHY: Yes. For example, in some  
14 plants, the building is a separate building.

15 CHAIRMAN WALLIS: It's in a separate  
16 building. It's in a separate building.

17 MR. KOSHY: Yes. For example --

18 CHAIRMAN WALLIS: Okay.

19 MR. KOSHY: -- they have separate  
20 building.

21 CHAIRMAN WALLIS: They might be in a  
22 separate building?

23 MR. KOSHY: Yes.

24 CHAIRMAN WALLIS: That's very different  
25 from, say, something that comes from off-site power,

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1 where the cable may be a long cable from --

2 MR. KOSHY: Yes. That will be  
3 significantly longer. That will be from the  
4 switchyard. In some cases, you will have a situation  
5 closer to the plant, where you bring down to 13 kVR or  
6 so.

7 CHAIRMAN WALLIS: Okay. Thank you.

8 MR. KOSHY: The next benefit is we can  
9 prevent the unanticipated failures that cause plant  
10 transients by using the maintenance rule as the scope.  
11 We are also looking at challenges to the plant in the  
12 sense of what will give you a plant transient. So  
13 that is what is seen as the scope of this generic  
14 letter.

15 The next is you can use a convenient  
16 outage if you know the rate of degradation. Rather  
17 than taking, you know, unwarranted outages, you can  
18 schedule that cable replacement for a convenient  
19 refueling outage and do the replacement with minimum  
20 interruption.

21 CHAIRMAN WALLIS: Are these cables usually  
22 designed so they can easily be pulled through to  
23 repair them?

24 MR. KOSHY: No. It is very  
25 time-consuming, most of the --

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1 CHAIRMAN WALLIS: There's not a big duct  
2 in the cable and you just drag through a new cable?

3 MR. KOSHY: No.

4 CHAIRMAN WALLIS: No? You have to take it  
5 out? You have to dig it up?

6 MEMBER SIEBER: It's the whole thing. No.

7 MR. KOSHY: Well, pull-through is there,  
8 but the thing is it has a lot of staging. And you  
9 have energized equipment on both sides. So you need  
10 to essentially take some bus outages. So it is  
11 significantly time-consuming.

12 CHAIRMAN WALLIS: Yes, but you don't have  
13 to dig it out?

14 MR. KOSHY: Unless it is direct buried  
15 cable.

16 MEMBER BONACA: In fact, I mean, for  
17 example, yesterday during the review of Monticello,  
18 the majority of their underground cable, they're  
19 buried.

20 CHAIRMAN WALLIS: Those are usually  
21 utility duct or something, in other words.

22 VICE CHAIRMAN SHACK: This is direct  
23 buried.

24 CHAIRMAN WALLIS: Direct buried cable?

25 MR. KOSHY: Those are not exceptions.

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1 Usually you will have a duct bank with some sleeves in  
2 there so that you can pull through it.

3 MEMBER BONACA: And it depends on the age  
4 of the plant. I mean, Monticello is an older plant.  
5 They buried it, and that was it.

6 MR. KOSHY: So you have a wide variety on  
7 those?

8 MR. MORRIS: Tom, George Morris, EEEB.  
9 Some of the original cables that were pulled through  
10 duct bank, all of the original cables that were pulled  
11 through duct bank, were pulled through with the use of  
12 cable lubricant to reduce the friction. After they  
13 had been in there for a while, that lubricant has  
14 dried up.

15 MEMBER BONACA: It doesn't work.

16 MR. MORRIS: In some cases, it's almost  
17 like concrete.

18 MR. KOSHY: Okay. Moving on to some  
19 examples, Ocone is a success story where they found  
20 that two of the six cables had significant  
21 degradation. And they were able to monitor it and  
22 take the outage at a convenient time so that they can  
23 replace them.

24 Another example I am using here is Peach  
25 Bottom. When they experienced a failure, they decided

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1 to make a global replacement. You know, they didn't  
2 want to do any testing at all. And that's also a  
3 solution.

4 CHAIRMAN WALLIS: Now, is it always water  
5 that leads to degraded cables? It seems to me that  
6 you could have a cable and a duct which might just --  
7 you know, the insulation can over a period of time  
8 oxide or whatever it does. I mean, even in your house  
9 without water, you get cables that --

10 MR. KOSHY: Yes.

11 CHAIRMAN WALLIS: The insulation cracks  
12 and so on.

13 MR. KOSHY: This has some influence in the  
14 sense if it is a dry insulation and there is only  
15 cracks, chances are it will survive a little longer.

16 CHAIRMAN WALLIS: That's right, but it may  
17 --

18 MR. KOSHY: The presence of chemicals --

19 CHAIRMAN WALLIS: Makes it work.

20 MR. KOSHY: -- create default.

21 CHAIRMAN WALLIS: It's not essential that  
22 you have moisture, is it?

23 MR. KOSHY: Right. You're right. We are  
24 not trying to look at the root cause of what causes  
25 the failure. We are more interested in seeing,

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1       irrespective of the causes, let's have a program in  
2       place so that we can prevent such unanticipated  
3       failures and have a great confidence in the accident  
4       mitigation capability. So that's the focus we are  
5       trying to get because for --

6                   CHAIRMAN WALLIS: There is no routine  
7       measurement of, say, resistance of ground of a cable?  
8       There is no routine --

9                   MR. KOSHY: There is some technology  
10      developing that way, but online systems have not been  
11      doing that well. I think the industry is headed that  
12      way and there is some aggressive effort in the  
13      industry for coming up with something like that or,  
14      rather, building confidence in the systems that are  
15      now under development.

16                   Oyster Creek is an example where they  
17      replaced the cables and they had few repeated  
18      failures. This design is also unique. They  
19      essentially had this cable going about 200 feet away  
20      from the main plant as an extension of the safety bus.  
21      And this is remaining energized all the time. And  
22      that earlier had several failures.

23                   So the information that we are requesting  
24      is provide to us a history of the cable failures in  
25      the scope that I discussed just before and a

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1 description and frequency of the inspection, testing,  
2 and the monitoring programs in place. And if you do  
3 not have a monitoring program in place, explain to us  
4 why such a program is not necessary. So that is  
5 essentially what we are asking in --

6 CHAIRMAN WALLIS: So this is really  
7 information gathering. This isn't requiring an  
8 action?

9 MR. KOSHY: Right, right.

10 VICE CHAIRMAN SHACK: Now, are you  
11 distinguishing between a monitoring program and a  
12 functional testing program here?

13 MR. KOSHY: Okay. The explanation that we  
14 have given, in fact, I am addressing as a response to  
15 a public comment, what we are saying is the functional  
16 testing that you do that you energize for a short  
17 period doesn't give you any confidence that it will do  
18 it again.

19 VICE CHAIRMAN SHACK: Okay. So you're not  
20 counting that as a monitoring program?

21 MR. KOSHY: Yes. We are not.

22 MEMBER SIEBER: A surveillance test.

23 MR. KOSHY: These are the organizations  
24 that have given response to the first version that  
25 went out for public comments. And I will address the

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1 highlights of how we addressed those comments.

2 Cable failures are random. And,  
3 therefore, no NRC action is required.

4 CHAIRMAN WALLIS: It sounds like saying  
5 they're an act of God or something.

6 MR. KOSHY: Yes. We just explained the  
7 surveillance activity, which wouldn't give you  
8 confidence on its future performance. You need to in  
9 some way monitor the condition of that insulation so  
10 that we can build that confidence.

11 Again, you know, this is the small group  
12 of cable where you have this problem. Otherwise, the  
13 rest of the cable is in a dry environment. Next to  
14 selectable sealed-in concrete, you know, these cables  
15 should be the most reliable piece of equipment in a  
16 plant, you know, should not be failing for about 40  
17 years or, in fact, for 60 years, you know, if it is  
18 the environment and the conditions are right.

19 And I quickly explained before that the  
20 low-voltage cables are included because some of the  
21 early vintage plants have this 480-volt equipment for  
22 safety buses, diesel, and naturalized emergency  
23 service water, and service water equipment.

24 CHAIRMAN WALLIS: The original sentence is  
25 garbled. It doesn't matter. Essentially we have a

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1 period after impact, and that's all right. Scope is  
2 limited.

3 MR. KOSHY: Okay. Again, we just  
4 addressed this issue, why this basic surveillance  
5 tests of operating for a half an hour or two hours  
6 wouldn't be sufficient to gain that confidence for --

7 CHAIRMAN WALLIS: What you do is you put  
8 on them the voltage that they would have in operations  
9 and --

10 MR. KOSHY: No. You actually energize a  
11 --

12 CHAIRMAN WALLIS: Do you actually have to  
13 have current going? Do you have to current going  
14 through these cables to test them or does it have the  
15 voltage applied to them and see if there's a leakage?

16 MR. KOSHY: Yes. There are about eight or  
17 ten techniques in the industry.

18 CHAIRMAN WALLIS: There's a whole lot of  
19 techniques.

20 MR. KOSHY: Yes, yes. And the thing is  
21 the early technique was just apply very high voltage  
22 and make it fail. That was the most crude way of  
23 doing it.

24 MEMBER SIEBER: Meggering.

25 MR. KOSHY: Meggering is another method,

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1 but that has certain weaknesses, too.

2 MEMBER SIEBER: You have reflective  
3 techniques.

4 MR. KOSHY: Yes. Time domain reflects  
5 III, and about six or eight techniques are there. And  
6 there are still some under development. Collectively  
7 you have about two IEEE standards that go into details  
8 of the type of tests available and the level of  
9 confidence that you have based on the type of cable.

10 So depending on if you have a shield and  
11 what kind of shield and what type of rubber material  
12 is used, the level of confidence is different, you  
13 know, depending on the type of test that you do.

14 So there is some industry that two IEEE  
15 standards are available to address that and which one  
16 is better and which one is desired.

17 MEMBER SIEBER: You can get some pretty  
18 high voltages in these cables from switching  
19 transients.

20 MR. KOSHY: That's true.

21 MEMBER SIEBER: It will go well beyond the  
22 rating for a very brief period of time. And sometimes  
23 that's when the insulation fails.

24 MR. KOSHY: Yes.

25 MEMBER BONACA: By "surveillance test,"

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1 you mean surveillance of the equipment and this power  
2 by the cable?

3 MR. KOSHY: Right. You are giving normal  
4 voltage and normal function of a couple of hours, you  
5 know, like in the pump in service inspection or type  
6 of surveillance you will expect to run in for two or  
7 three hours, make sure it is for using the rate of  
8 flow and things like that. That's the type of test  
9 that will not give you a feeling of how good the  
10 insulation is. Will it last for the next two weeks of  
11 runoff?

12 The regulatory basis for our cable  
13 monitoring is we have added that what is seen in bold,  
14 that condition is something that we really did not  
15 have in the first version. And we are essentially  
16 saying that "assess the continuity of the systems and  
17 the condition of the components." So you need to know  
18 the condition of this insulation so that we can have  
19 that confidence on its performance.

20 MEMBER ARMIJO: Could you expand that?  
21 Condition based on electrical properties? Are you  
22 actually looking for physical condition? They're in  
23 accessible.

24 MR. KOSHY: These are inaccessible, but  
25 you do have state-of-the-art techniques available in

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1 electrical testing which will measure the testing of  
2 the insulation.

3 MEMBER ARMIJO: Okay.

4 MR. KOSHY: So if you can establish that  
5 the integrity of the insulation is reasonable, then  
6 you have that confidence that it will not fail in the  
7 most probable cases.

8 MEMBER ARMIJO: Thank you.

9 MR. KOSHY: The question was regarding  
10 multiple cable failures. The only example that we  
11 have collected in light of our efforts is a case where  
12 one insulation failure was in the circulating water  
13 pump, resulted in taking two other substations out  
14 with it.

15 The possibility that we are talking of is  
16 the fault itself causes a transient and sends some  
17 transient current. And if you have some near-failure  
18 equipment, that can be a cause for additional  
19 failures. You know, these are speculative problems.  
20 And this is the only example that we have on record  
21 for that.

22 Now, the modifications that we have done  
23 in light of the comments on this are editorial in  
24 nature, a good part. We revised the scope to include  
25 the above-ground and below-ground duct banks; removed

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1 the broadband spectroscopy because that's not a proven  
2 technique yet, but, again, that could be a technique  
3 available in the future; revised the requested  
4 information to include the type of service so that we  
5 will be able to know if there are repeated failures in  
6 a certain area. And we revised the data collection  
7 time to 60 hours.

8 CHAIRMAN WALLIS: So it would seem that  
9 there is still a gap between your view and the  
10 industry's view.

11 MR. KOSHY: Yes.

12 CHAIRMAN WALLIS: The industry had some  
13 pretty strong comments. And your modifications don't  
14 reflect large changes in response to their comments.

15 MEMBER SIEBER: Right.

16 CHAIRMAN WALLIS: So there would seem to  
17 be still a big gap between your view and the  
18 industry's view. Is that true?

19 MR. KOSHY: I will address that in the  
20 next slides along with the NEI white paper issues, in  
21 slides 16 and 17.

22 CHAIRMAN WALLIS: Okay.

23 MR. KOSHY: We presented this to CRGR.  
24 And CRGR asked us to do two improvements on the  
25 generic letter: to bring the focus on the power

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1 cables itself and also to add a safety-related example  
2 to show the significance of this failure on a plant.  
3 In the package that you have received, we have  
4 incorporated those changes.

5 We received the NEI white paper much after  
6 the comment period on May 1st. I have addressed the  
7 highlights in this coming couple of slides. One is a  
8 graded approach. Again, the number that you see on  
9 the top is the sections that correspond to the NEI  
10 white paper, 6.6.

11 The graded approach for monitoring and  
12 replacement of cables, the bullets are many cables do  
13 not power safety-related equipment; and the other one,  
14 graded approach to replacement and monitoring is best  
15 for safety and business reasons.

16 Our response is that we are only focusing  
17 on those that are significant. That's the very reason  
18 that we are using to bring the scope down to the  
19 maintenance rule. And we mentioned certain systems in  
20 there because to, let's say, overcome the variances  
21 and interpretations on that rule and also because  
22 those examples that we state there are the ones that  
23 have most impact on the plant in the sense affecting  
24 multiple systems.

25 Therefore, these are classified as most

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1 important because of these reasons. And, therefore,  
2 you know, it will be important to prevent the  
3 transients and also in supporting of mitigating the  
4 accident.

5 So that's how we have narrowed the scope  
6 and as to bringing down to only important cables and  
7 not all of the cables at large. And the numbers that  
8 you see in that white paper are some plants have like  
9 300-plus cables. And that won't be within the scope  
10 of maintenance rule.

11 The next one, the recommendations again in  
12 chapter 8, is provide dry environment, prepare for  
13 cable failures, and share failure resolutions.

14 Providing a dry environment -- again, you  
15 know, these are all installed cables. It's not quite  
16 practical. And pumping out would help. It will slow  
17 down the failure, but it cannot prevent the failure.  
18 It may take a little longer. And these cable failures  
19 could affect many systems. And the replacement of  
20 these cables is very time-consuming.

21 So if you have a valid accident mitigation  
22 method and at that time trying to make this cable  
23 replacement could be very difficult because the cables  
24 that run in the same duct banks could be helping the  
25 accident mitigation at that time. And your cable

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1 pulling and taking bus outages would not be desirable  
2 actions when you run into an accident environment or  
3 facing a LOOP or a station blackout.

4 And the technique is available there to  
5 have that reasonable confidence so that we can rely on  
6 these cables for continued operation.

7 That's all we have prepared for presenting  
8 to you. And if you have --

9 MEMBER BONACA: I have a question --

10 MR. KOSHY: Sure.

11 MEMBER BONACA: -- regarding in the  
12 generic letter, you talk about 23 LERs --

13 MR. KOSHY: Right.

14 MEMBER BONACA: -- and two monitor  
15 reports. Then the letter says that you believe that  
16 this is a very small fraction. That is the word used  
17 in the LER in the generic letter, a very small  
18 fraction of the actual failure to take place, which  
19 tells me that the number of failures that happen may  
20 be in the hundreds.

21 What is the projection? What does it mean  
22 that 25 in total is a very small fraction?

23 MR. KOSHY: It's very difficult to make  
24 such an estimate, but let me give a personal  
25 experience that I know of. I was at an AIT for a

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1 plant where they had such a cable failure. At that  
2 time they had six cable failures already when we had  
3 the AIT in the mid '80s. So that is repeated failures  
4 happening at one plant.

5 MEMBER BONACA: Okay.

6 MR. KOSHY: Again, I know of another  
7 Northeastern plant where they have all of these  
8 service water cable and emergency service water cables  
9 going through manholes. And they had splices in that  
10 also. And this manhole gets filled with water. And  
11 when the manhole cover knocks out, that's when you  
12 find out the splice failed. They had also quite  
13 repeated failures.

14 So certain plants may have a higher  
15 susceptibility because of groundwater and the design  
16 uniqueness. There may be some plants in absolutely  
17 dry environment, like WNP 2 in the middle of the  
18 desert. They may not have any cable problems because  
19 it's always dry. and if it all drains, it dries out  
20 so fast. So some plants may be fully exempt from this  
21 problem.

22 If the water table is a guide, those are  
23 the ones where you have high susceptibility and  
24 failures. And some plants are kind of glaringly  
25 different than others.

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1 MEMBER BONACA: The information you are  
2 requesting is regarding all cables, right, not only  
3 those in a weather condition?

4 MR. KOSHY: All cables and inaccessible.

5 MEMBER BONACA: Inaccessible.

6 MR. KOSHY: Yes.

7 MEMBER BONACA: Exactly. Okay.

8 MR. KOSHY: So plants where they did not  
9 have failures would not have anything to report. But  
10 if you had failures, we would like to know them --

11 MEMBER BONACA: Yes.

12 MR. KOSHY: -- so that we can kind of  
13 gauge, you know, are there repeated problems, what are  
14 the vulnerabilities, and based on that probably share  
15 the lessons and see if you have to take further  
16 action. Maybe it's down to a few plants. We do not  
17 know that because we lack the data to support that.

18 And the NEI white paper data shows about  
19 15 plants having about 45 to 50 failures. That could  
20 be an indication because they focused on underground  
21 and medium voltage only.

22 MEMBER BONACA: But your monitoring  
23 program that you're talking about doesn't deal only  
24 with cables that failed. It deals with cable aging  
25 that may be operable during functional testing that

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1 failed during demand, service.

2 So how are you going to gather information  
3 regarding these kind of cables?

4 MR. KOSHY: Okay. What we are saying is  
5 if those cables are within the scope of maintenance --

6 MEMBER BONACA: Yes.

7 MR. KOSHY: -- and they're underground and  
8 inaccessible, tell us if you have failures. And do  
9 you have a program when they have this susceptibility  
10 for failure to make sure that it wouldn't fail?

11 MEMBER BONACA: I understand.

12 MR. KOSHY: So you're not on the scope.  
13 Tell us what the failure is. And see how you monitor.

14 MEMBER BONACA: Right.

15 MEMBER ARMIJO: I have a question. How  
16 can you have a failure of above-ground inaccessible  
17 cable without water? Is it --

18 MR. KOSHY: Okay. What happens is, you  
19 know, even in some large conduit connections which go  
20 on the surface because of the variance, you get  
21 condensation built in there unless you have a way of  
22 venting it out.

23 MEMBER ARMIJO: Well, it could be a  
24 significant amount of water.

25 MR. KOSHY: You could collect all the

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1 time.

2 CHAIRMAN WALLIS: You get a humid day and  
3 a cold night.

4 MR. KOSHY: For the condensation and --

5 MEMBER SIEBER: You can get cable failures  
6 from things other than water.

7 MR. KOSHY: Yes, other chemicals and other  
8 leeching, yes.

9 MEMBER SIEBER: Chemicals, overheating.  
10 You know, that degrades insulation or defect in  
11 splices, for example, if --

12 MR. KOSHY: Yes. Splices is another  
13 vulnerable point.

14 MEMBER SIEBER: It's handmade.

15 MEMBER MAYNARD: A couple of questions.  
16 On the provided inscription of the frequency of all  
17 inspection testing, monitoring, are you talking about  
18 what is currently in place or are you asking the  
19 licensee to go back to day one for all of what testing  
20 has been done?

21 MR. KOSHY: We are asking for what you  
22 have in place now so that you can put in place such  
23 unanticipated failures.

24 MEMBER MAYNARD: Okay. And the other  
25 thing is, is the staff coordinating in any way? This

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1 is requesting this information to be within 90 days.

2 MR. KOSHY: Right.

3 MEMBER MAYNARD: And it would appear to me  
4 that if the other generic letter on the spurious  
5 actuation gets issued, a lot of the same resources  
6 could be required or needed for a lot of these  
7 activities, both dealing with electrical circuits,  
8 just --

9 MEMBER SIEBER: This one is pretty --

10 MR. KOSHY: We will work with the Generic  
11 Communications Division so that we would be sensitive  
12 to that.

13 CHAIRMAN WALLIS: So what are you going  
14 with the information when you get it?

15 MR. KOSHY: What we are hoping is that  
16 depending on, let's say, the breadth and depth of the  
17 problem as to why widespread, we may have to think of  
18 NRC action if that warrants it. We have --

19 CHAIRMAN WALLIS: You think that there  
20 might be some problem. You have this sort of you  
21 almost call it a fishing expedition, where you get all  
22 of this information. And then you look at it and say,  
23 "Aha. Now we have to do something or not." You're  
24 not quite sure what you are going to find.

25 MR. KOSHY: Okay. We know it is a

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1 significant problem in the light of what I explained  
2 to you.

3 CHAIRMAN WALLIS: There have been events,  
4 right.

5 MR. KOSHY: Yes. We have been having  
6 events, which either the plant is out or disabled  
7 safety systems. And those things kind of give you a  
8 flavor of significance.

9 CHAIRMAN WALLIS: But the result of all of  
10 this information gathering might be that you decide  
11 everything is okay as it is now.

12 MR. KOSHY: If the industry has, let's  
13 say, commitments to prevent such failures, yes. But  
14 if you are seeing failures and repeated failures, we  
15 have to rethink what we should be doing. Okay? We  
16 are not there yet. We need to --

17 MR. MAYFIELD: Professor Wallis, this is  
18 Mike Mayfield from the staff. As we assess the  
19 results we get back from this, we would have to make  
20 a decision whether generic action is warranted or is  
21 there some plant-specific action that is warranted or  
22 things are being managed appropriately as it is. And  
23 we just don't know until we get the results back. We  
24 have enough indicators to make us believe that we need  
25 to go --

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1 CHAIRMAN WALLIS: I think the industry  
2 response to the public comments was everything is  
3 fine, we're doing the right thing now. You just want  
4 the assurance that it really is so.

5 MR. MAYFIELD: That might be the outcome.  
6 And we'll have to see what actually comes in.

7 MEMBER SIEBER: The third question sort of  
8 tips your hand as to what you want. And it says if a  
9 monitoring or surveillance program is not in place,  
10 explain why such a program is not necessary.

11 In other words, here's a plant with  
12 failures. And they're not testing anything.

13 MR. MAYFIELD: We might want to chat with  
14 them a bit.

15 MEMBER SIEBER: You gave them the hint.  
16 You ought to test something.

17 MEMBER BONACA: Or you may have a plant  
18 where there have been no failures and you have no  
19 significant power equipment. Then why should you even  
20 have a test? I mean, then you have a threshold for  
21 saying, "We don't need it."

22 MEMBER MAYNARD: I've got a feeling when  
23 you get all of this, the actual number of failures if  
24 you divide it by the number of plants and the number  
25 of operating years wouldn't look that great, but when

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1 you go to group them, there may be some areas where  
2 you --

3 MR. MAYFIELD: Exactly. And that is not  
4 an uncommon outcome from getting this kind of  
5 information.

6 MR. KOSHY: One thing you find out is the  
7 data that we have at this time is based on normal run  
8 and surveillances, not an extended use of like two,  
9 three weeks. So what we are trying to see is gain  
10 confidence that these cables can continue in service  
11 for two or three weeks if there is a station blackout  
12 or some reason and we can continue to rely on these  
13 cables for that safety function.

14 MEMBER BONACA: Yes. That is a very  
15 important issue, you know, the failure to run. So the  
16 equipment starts, but then it won't run for as long as  
17 it has to. And that's trickier because, I mean, the  
18 number of failures experienced to date doesn't give  
19 you a specific insight on these cables. And that's  
20 their function.

21 MR. KOSHY: Right.

22 MEMBER BONACA: Any additional questions?

23 (No response.)

24 MEMBER BONACA: If not, I thank you for  
25 the presentation.

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1 MR. KOSHY: Thank you.

2 MEMBER BONACA: I think Mr. Marrion of NEI

3 --

4 MR. MARRION: Yes.

5 MEMBER BONACA: -- would like to make a  
6 statement. NEI, of course, produced that white paper  
7 that is quite interesting on this issue.

8 MR. MARRION: Good afternoon. I'm Alex  
9 Marrion, the Senior Director of Engineering at NEI.

10 I do have a couple of comments I want to  
11 make about basically what we heard. We haven't seen  
12 the staff disposition of the public comments that have  
13 been submitted. Nor have we seen the current version  
14 of the proposed generic letter.

15 But I have to tell you I am confused. And  
16 the reason for that confusion is that a couple of  
17 years ago, I received a letter from the Electric  
18 Systems Branch Chief articulating concern with a  
19 potential common mode of medium voltage cables. And  
20 the common mode failure mechanism was water training.  
21 This was based upon a review of 20-some odd licensee  
22 event reports.

23 We had a public meeting with the staff to  
24 understand, get a little more of an understanding of,  
25 their concerns. And we looked into the licensee event

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1 reports, and they had -- I'm trying to remember. I  
2 think there was only one or two that had a potential  
3 for being related to the water-training phenomenon  
4 that the staff was concerned with.

5 But it became clear to us that we needed  
6 to develop a document that would be an educational  
7 piece, if you will, primarily focusing for the  
8 industry, but we also felt that the NRC could possibly  
9 benefit from it. And that was the basic objective for  
10 the white paper that we developed.

11 The purpose for the educational piece was  
12 to articulate a clear understanding of the  
13 water-training phenomenon to articulate our assessment  
14 of the licensee event reports that the staff was using  
15 as a basis --

16 CHAIRMAN WALLIS: You're talking about a  
17 water-training phenomenon?

18 MR. MARRION: Water training, yes.

19 CHAIRMAN WALLIS: Training. Oh, I'm  
20 sorry.

21 MR. MARRION: Yes, water training. I'm  
22 sorry. I've got a cold, and I'm a little congested.  
23 I apologize.

24 CHAIRMAN WALLIS: That's my  
25 misunderstanding. I'm sorry.

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1 MR. MARRION: -- and also provide us a  
2 technically based understanding of the application of  
3 that phenomenon to basic cable configurations and  
4 insulation systems that exist in the power plants  
5 today or not in the power plants but exist in these  
6 applications today.

7 We concluded that you can't make a general  
8 statement that water training is of concern because  
9 it's not applicable to every cable configuration and  
10 insulation system that's in the field today.

11 It appears that the staff is attempting to  
12 require a cable-monitoring program. I'm not familiar  
13 with the details of the maintenance rule, but I know  
14 that the equipment to which these cables are  
15 terminated are monitored in the maintenance rule.

16 And since the cables aren't active  
17 components, I'm not sure whether they should be  
18 included in the maintenance rule or not. But  
19 fundamentally if the staff expectations and basis in  
20 this generic letter are not clear, you have the  
21 potential of a generic letter basically undermining a  
22 regulation.

23 I don't know if the staff has done a  
24 review with the maintenance rule folks within NRR, but  
25 I would recommend that be done before this is

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1 submitted.

2 CHAIRMAN WALLIS: You're implying this,  
3 but, in fact, they just say they're gathering  
4 information. And it's not clear that they intend to  
5 do anything which would change the regulation in any  
6 way or interfere with regulation. You don't know what  
7 they're going to do.

8 MR. MARRION: And the licensee has to  
9 document a justification of why they don't have a  
10 cable-monitoring program. That is --

11 CHAIRMAN WALLIS: But you're implying that  
12 something downstream is going to require this. That's  
13 not actually a --

14 MR. MARRION: No. I'm implying there may  
15 be a conflict between what the generic letter is  
16 asking for and what is required by the --

17 CHAIRMAN WALLIS: You're asking for  
18 information, rather.

19 MR. MARRION: Well, okay. That's one way  
20 of looking at it. It is a request for information or  
21 an attempt to require a cable-monitoring program. And  
22 I'll let you folks decide how you want to do that if  
23 they want to interpret that.

24 I think that, you know, the staff has made  
25 some comments about, you know, what their concern is.

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1 And it's not clear to me. I have to tell you I'm  
2 confused. Maybe it's because of our involvement over  
3 the past several years, but I have yet to see any kind  
4 of risk analysis or any kind of statistical analysis  
5 conducted by the NRC to articulate some level of  
6 confidence that they find unsatisfactory relative to  
7 the performance of the cable or the equipment.

8 We have attempted to do some statistical  
9 work in our white paper based upon the survey that we  
10 had conducted. I'm not happy with the fact that we  
11 didn't get 100 percent of the utilities to respond,  
12 but we got on the order of 80 percent, I think, 79.  
13 something. That has some benefit.

14 My concern at this particular point is  
15 when the generic letter is finally issued, based upon  
16 what I heard this afternoon, we're going to have to  
17 request a meeting, a public meeting, and probably  
18 document further clarification of what the NRC is  
19 really interested in this information request as they  
20 go forward because it's not clear at this particular  
21 point in time. And that's all I have to say. I would  
22 be more than happy to answer any questions you may  
23 have.

24 (No response.)

25 MR. MARRION: Okay. Thank you.

1 CHAIRMAN WALLIS: You're welcome.

2 You were suspicious that if they gather  
3 this information, then they might use it to require  
4 something which they wouldn't be able to do if they  
5 didn't have the information?

6 MR. MARRION: No. It's not clear what  
7 concern is trying to be addressed by the request for  
8 information.

9 CHAIRMAN WALLIS: Well, the concern is  
10 that these cables will fail. It's a simple concern.

11 MR. MARRION: Well, where does that  
12 concern stop? Do you stop at these cables or do you  
13 continue that concern at the equipment, et cetera,  
14 that is under continuous surveillance programs and  
15 testing? I mean, where does it end?

16 And it's a concern about having possible  
17 unanticipated failures? Well, where do you stop  
18 asking that question now that you started on medium  
19 voltage cables and the small population of medium  
20 voltage cables, I suspect?

21 So there are some real issues that have to  
22 be addressed here because the utilities are going to  
23 want to be responsive to the generic letter. My job  
24 is to make sure that we understand it adequately so  
25 the utilities will be responsive, but right now I'm

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1 not sure we have that understanding.

2 MEMBER BONACA: Well, if I understand it,  
3 I mean, the issue has to do with two things. One is  
4 inaccessible equipment that cannot be visually or  
5 other means inspected -- so it's a very narrow family  
6 -- and then equipment that is really in accepted  
7 applications.

8 And clearly equipment is seeing a water  
9 condition or wetness that -- so it's a pretty unique  
10 and narrow population, but I think at least I am  
11 interested to know what kind of equipment is being  
12 powered by this kind of cable out there. And if it is  
13 something critical, a generic letter or whatever,  
14 connection to off-site power, you know, it's a unique  
15 concern.

16 I mean, we addressed it and discussed it  
17 during license renewal because it was significant.  
18 And the industry and the NRC worked together on a goal  
19 inspection program for those cables.

20 And where does the aging start? I mean,  
21 does it start with a theatre of operation or does it  
22 start before? Clearly there is degradation taking  
23 place at some point. I realize I don't know all there  
24 is necessary to know about that.

25 MR. MARRION: If I may just offer a couple

1 of comments?

2 MEMBER BONACA: Yes?

3 MR. MARRION: The aging phenomenon begins  
4 from the time that the cable is shipped from the  
5 manufacturer's facility.

6 MEMBER BONACA: That's right.

7 MR. MARRION: And it's exacerbated by  
8 environmental conditions as well as operational  
9 conditions that wind up stressing the cable insulation  
10 system. And a submerged, wetted environment for  
11 certain insulation systems has the potential of  
12 increasing the aging or the rate of aging degradation,  
13 et cetera. That is well-known.

14 The equipment that's affected here  
15 includes diesel generators at some plants at 4,000 or  
16 4,160 volts as well as other plants at 6.9 kV. I  
17 don't know about -- I think one of the staff was --  
18 Tom made a comment about some diesel generators  
19 operating in the 480 volts. If that's indeed the  
20 case, then that's indeed the case.

21 But mean voltage cable in the industry is  
22 characterized as 2,000 to 15,000 volts. So I'm hoping  
23 that the generic letter will be very clear of  
24 articulating the 480-volt applications. And is it  
25 only for that particular piece of equipment or is it

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1 for something else? That's one of the points of  
2 clarity that's needed.

3 We tried to capture in our white paper --  
4 and I hope you've read it; we've made it available to  
5 you -- the current state of understanding of cable  
6 insulation systems at this voltage level and  
7 underground applications and which insulation systems  
8 are susceptible to water damage over time.

9 We have encouraged the utilities to  
10 prepare for such failures because if you look at the  
11 age of the fleet, we are approaching the end of  
12 service life of a lot of these cables. It's typically  
13 30, 35, 40 years based upon normal environmental  
14 conditions.

15 And our recommendation to the industry was  
16 don't wait for a failure before you have to deal with  
17 this problem because this is not the kind of cable  
18 that you typically keep large quantities in inventory  
19 at the warehouse, et cetera. And if you're not  
20 prepared, you will have an extended outage should you  
21 have such a failure.

22 I don't know if the generic letter is  
23 going to speak to that, but I also know that there is  
24 not a cable-monitoring system that is applicable and  
25 effective and available to the utilities today.

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1           There are some testing techniques that are  
2 effective for certain kinds of insulation  
3 configurations. And our white paper speaks to that.  
4 But based upon the information I have gotten from  
5 EPRI, who is pursuing research in this area, et  
6 cetera, that there isn't one technique that would be  
7 useful. So okay?

8           MEMBER BONACA: Thank you.

9           MR. MARRION: Thank you.

10          MEMBER BONACA: Yes. I think we're  
11 scheduled for some closing remarks. Is there?

12          MR. MAYFIELD: Just very briefly. We  
13 believe we have articulated why we need the generic  
14 letter. If indeed there is substantive confusion or  
15 misunderstanding once we have published the generic  
16 letter, we would, as always, be more than willing to  
17 meet with the industry and make sure that there is a  
18 common understanding of what we're asking for.

19          This generic letter has been in process  
20 for a while. And we do believe we need to move  
21 forward to get the generic letter published and allow  
22 licensees the opportunity to engage with it. We will  
23 be mindful of any conflicts with other generic  
24 communications that are going forward where we may be  
25 imposing unreasonable time constraints and resource

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1 constraints on the licensees. That's something that  
2 we will pay attention to and go back and pulse with  
3 the generic communication staff and the other  
4 technical staff to make sure we're online there.

5 With that, unless the Committee has other  
6 questions for the staff, I believe we have presented  
7 to you the information that we wanted to present. And  
8 we look forward to receiving a letter from you. Thank  
9 you.

10 MEMBER BONACA: Any other questions for  
11 Mr. Mayfield?

12 MR. FALLON: I have a question. Mike  
13 Fallon with Constellation Energy.

14 For the license renewal applicants that  
15 have submitted under the GALL report, these cables are  
16 all in the scope of license renewal, have been  
17 addressed in their applications. Are they being asked  
18 to resubmit this information again?

19 MR. KOSHY: This is Thomas Koshy.

20 This generic letter will fall under the  
21 Part 50 program, in which case we are addressing,  
22 let's say, something more than what was addressed in  
23 the renewal program. So there is a need for making  
24 separate submittal to the NRC in response to this  
25 generic letter.

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1 MR. FALLON: All of the cables that you  
2 have addressed, all of the safety-related cables, are  
3 in the scope of license renewal. And whether they're  
4 480-volt or they're medium voltage, they're addressed  
5 in those applications.

6 MR. MAYFIELD: Okay. Let me comment.  
7 This is Mike Mayfield from the staff.

8 You raise a good point. It is something  
9 we will look at and make sure we're not asking you to  
10 unnecessarily duplicate information. But that is a  
11 fair question, something that we'll make sure that --

12 MEMBER BONACA: Well, I am not aware that  
13 license renewal applications have the summary of all  
14 of the failures that have taken place. We are going  
15 to get to the information.

16 MR. MAYFIELD: We don't think we are in  
17 conflict, but it's a fair question. And we'll look to  
18 make sure we are not asking an unreasonable question.

19 CHAIRMAN WALLIS: But you will be looking  
20 at plants which doesn't necessarily have license  
21 renewal in prospect.

22 Are we through with this item now or --

23 MEMBER BONACA: Are there additional  
24 questions for the staff, for industry, for us?

25 (No response.)

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1 MEMBER BONACA: If none, I think it's  
2 over.

3 CHAIRMAN WALLIS: Thank you.

4 MEMBER BONACA: And we open it up back to  
5 you, Mr. Chairman.

6 CHAIRMAN WALLIS: Now, I really am  
7 reluctant to take a break for an hour. I wonder if we  
8 couldn't work on -- is it okay, staff who is an expert  
9 on this? Can we work on Mario's letter on this issue  
10 right now on just a preliminary basis?

11 Let's go off the record and work on his  
12 letter for half an hour or an hour.

13 MEMBER SIEBER: We have to come back.

14 CHAIRMAN WALLIS: Can we do that? You're  
15 not ready? We do have a draft letter. Will the  
16 Committee agree to work on his letter? We can discuss  
17 it now, but I think we can go off the record and  
18 discuss our reaction to this generic letter and work  
19 on our letter until about 3:00 o'clock. Is that okay  
20 with the Committee?

21 So let's do that. We'll come off the  
22 record now, and we will work on this letter until  
23 about 3:00 o'clock. We'll have some discussion now  
24 off the record.

25 (Whereupon, the foregoing matter went off

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1 the record at 2:25 p.m. and went back on  
2 the record at 3:18 p.m.)

3 CHAIRMAN WALLIS: We will come back on the  
4 record, come back into session.

5 CHAIRMAN WALLIS: The next item on the  
6 agenda is, let's see now, interim staff guidance. Is  
7 that what it is?

8 MEMBER BONACA: Yes.

9 CHAIRMAN WALLIS: And I will again call on  
10 Mario Bonaca to lead us through this one.

11 MEMBER BONACA: Okay.

12 4) INTERIM STAFF GUIDANCE AGING MANAGEMENT PROGRAM

13 FOR INACCESSIBLE AREAS OF BOILING WATER REACTOR

14 (BWR) MARK I CONTAINMENT DRYWELL SHELL

15 4.1) REMARKS BY THE SUBCOMMITTEE CHAIRMAN

16 MEMBER BONACA: We have the staff here to  
17 provide us with an overview on the proposed license  
18 renewal interim staff guidance on steel containment of  
19 BWR Mark I containments.

20 We have reviewed a number of BWRs. And  
21 we have often asked the question on the status of the  
22 steel liner. And we have seen different proposals by  
23 licensees, some of them planned inspections, only  
24 metric inspections. Some of the others don't.

25 And the staff is using a successful

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1 process that has been successful in most of the  
2 license renewal applications to date, the ISG process,  
3 as a means of proposing an approach that they expect  
4 the licensees to follow regarding this particular  
5 item.

6 And so the staff has come here to give us  
7 an overview of this process and what they are  
8 proposing to do. And I will let the staff go ahead.  
9 I don't know if Mr. Gillespie or Mayfield --

10 MR. GILLESPIE: Yes. If I could, just  
11 some opening comments to put in context what Linh and  
12 Hans are going to go through. Not only did we do a  
13 couple already, but we've got something like seven  
14 Mark I's lined up in the queue. And we have a number  
15 of very controversial ones in New Jersey,  
16 Massachusetts, and Vermont, where there is actually a  
17 lot of public interest. And we had no position on the  
18 liner itself.

19 There are some caveats or I'm going to say  
20 some wiggle room in this position I'd like to  
21 highlight to the Committee by way of how the staff is  
22 approaching this because a question at the meeting  
23 yesterday at Monticello was, why is it different plant  
24 to plant if you're trying to apply a consistent  
25 approach.

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1           This is kind of an approach for the plant  
2           that's got almost like the optimum conditions, of  
3           which Monticello with their leakage control programs  
4           and some things they were doing was.

5           Browns Ferry, an earlier one, which  
6           committed to doing some other measurements, actually  
7           had an operating history of having leaks. And so they  
8           had moisture content in there. And so we actually  
9           have -- this is a minimum condition, as we would look  
10          at it.

11          And there are also some wiggle words,  
12          quite honestly, in this. And that's where it says  
13          first you have to establish a degradation rate,  
14          basically. And then if you get moisture, this  
15          basically treats moisture in the outside of the shell  
16          the same as visible accelerated corrosion on the  
17          inside.

18          And we're using the ASME code kind of  
19          enhanced inspection, but, instead of referencing the  
20          code, we described the enhanced inspection in it in  
21          case the code changes in the future.

22          So we're bringing definition to an  
23          equivalence to inside and outside indications. And  
24          there is still a lot of room on how you establish the  
25          rate and what is the credibility of the rate.

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1           And so if you have a history as a facility  
2 of having leakage and, therefore, moisture in there,  
3 then I think the Committee should expect the staff in  
4 establishing the rate in those wiggle rooms because it  
5 says if you have moisture, reestablish your rate again  
6 -- and the only way to factually reestablish the rate  
7 is likely do a UT measurement and then connect the  
8 dots again. Literally a simplistic way of looking at  
9 it is a regression line between the now additional  
10 point.

11           And so Hans in his efforts as a reviewer  
12 still has a lot of room in what are the uncertainties  
13 in establishing the rate. And it's those  
14 uncertainties which kind of differentiate one plant  
15 from another. How do you reduce those uncertainties  
16 given different operating histories?

17           And so that's really how come Monticello  
18 is different from Browns Ferry. It's strictly  
19 operating history and the uncertainty involved with  
20 known moisture leak on multiple occasions.

21           So, with that, let me turn it over to Linh  
22 because that's just kind of the context. Linh, take  
23 it away.

24           4.2) BRIEFING BY AND DISCUSSIONS WITH  
25           REPRESENTATIVES OF THE NRC STAFF

1 MS. TRAN: Good afternoon. My name is  
2 Linh Tran. And I'm the Project Manager with the  
3 Division of License Renewal. And this is Hans Ashar.  
4 He's a senior civil engineer with the Division of  
5 Engineering.

6 We are here this afternoon to present the  
7 proposed license renewal interim staff guidance for  
8 the inaccessible area of the BWR Mark I drywell  
9 containment shell.

10 The purpose of this ISG is to provide  
11 guidance to future applicants on the information that  
12 is needed to be included in the license renewal  
13 applications for addressing the inaccessible area of  
14 the drywell shell.

15 Now, the proposed ISG here does not impose  
16 any no new technical requirement. And in previous  
17 license renewal application review by the staff, we  
18 usually can obtain the information in the applications  
19 or through the request for additional information.  
20 And usually we will get the information from the  
21 applicant.

22 The information provided by the applicant  
23 is sufficient for the staff to make its determination.  
24 However, it is not the most efficient way because of  
25 the RAI back and forth. And in an effort to reduce

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1 the number of RAIs, this proposed ISG would identify  
2 the information up front, so for the future  
3 applicants, what they should include in the LRAs, I  
4 guess, to make the staff review more efficient,  
5 information such as inspection results or analysis  
6 that would help the staff make the determination  
7 whether the containment would perform its intended  
8 function for the period of extended operation.

9 Past operating experience in the Mark I  
10 steel containments indicate that when water is  
11 discovered in the bottom outside area of the drywell  
12 shell, the most likely cause could be the water  
13 seeping through the inaccessible area.

14 And in slide 10 in your handout, I have a  
15 picture of the drywell shell. It is an inverted light  
16 bulb. That indicates where the inaccessible area  
17 would be.

18 And this area is the area for the distance  
19 between the drywell shell -- did you do slide 10?;  
20 that's a picture there; yes -- where the surrounding  
21 concrete structure is too small for successful  
22 performance of visual inspection. That's the area  
23 right there. The gap is usually two inches, three  
24 inches.

25 CHAIRMAN WALLIS: You used the term

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1 "seeping." It's really any water that gets there from  
2 any reason whatsoever.

3 MS. TRAN: Correct.

4 CHAIRMAN WALLIS: And "seeping" is used as  
5 a general term.

6 MS. TRAN: Term, correct.

7 CHAIRMAN WALLIS: It may not seep. It may  
8 actually flow or --

9 MS. TRAN: Flow through, right.

10 MR. ASHAR: The area that we are  
11 concentrating on is between the shell, between the  
12 shell and the concrete in the back, in between the  
13 insulation --

14 MEMBER BONACA: No, no, no.

15 MR. ASHAR: Oh, I'm sorry. Wrong place.

16 MS. TRAN: Right. That's --

17 MEMBER APOSTOLAKIS: It is between what  
18 and what?

19 MR. ASHAR: Between the freestanding steel  
20 containment --

21 MEMBER BONACA: Between the light bulb and  
22 the --

23 CHAIRMAN WALLIS: There's a space right  
24 there.

25 MR. ASHAR: And mostly it is filled with

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1 insulation.

2 MEMBER APOSTOLAKIS: How does the water  
3 get there?

4 MR. ASHAR: Water gets into -- I'm going  
5 to explain. There are three basic sources of water  
6 that we have seen so far in the operating history.  
7 One can be called because of the -- we don't have any  
8 picture of the actual area.

9 MS. TRAN: No. This is it.

10 MR. ASHAR: This is it. In this area,  
11 there are bellows, bellows between the driver.

12 CHAIRMAN WALLIS: We saw them this  
13 morning.

14 MR. ASHAR: Yesterday you may have seen  
15 it, yes. And those bellows can crack. And then they  
16 can give a seepage into the trough, which collects the  
17 water.

18 Now, if the drain, which is supposed to  
19 drain out all the water from there, is full or is not  
20 working properly, the water can accumulate in the  
21 trough area, which has been kept just for that  
22 purpose. And it may all flow in coming to this area  
23 here.

24 CHAIRMAN WALLIS: It's lower.

25 MR. ASHAR: Because it is not showing

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1 better this particular detail, this is not good  
2 enough. Yesterday it was a very nice picture here.

3 CHAIRMAN WALLIS: But in order to refuel,  
4 you have to flood the upper region there.

5 MR. ASHAR: That is correct.

6 CHAIRMAN WALLIS: And some of that water  
7 can get down on the outside.

8 MEMBER APOSTOLAKIS: Okay. Thank you.

9 MS. TRAN: Now, in this --

10 VICE CHAIRMAN SHACK: Now, is that the  
11 only source of the water, I mean?

12 MR. ASHAR: No, no. There are two or  
13 three we found so far. Okay? One is a cracking of  
14 bellows. Second one is there is a refueling seal  
15 between the bottom of the trough, concrete trough.  
16 And there is a systematic way of draining it out  
17 through a drainage. But drain gets clogged. And the  
18 water comes through that area. It collects in the  
19 trough again and goes into between the concrete and  
20 the drywell shed.

21 Clog one is the reactor cavity wall. You  
22 have a stainless steel liner on it. And stainless  
23 steel liner gets -- they may do for any reason. And  
24 the water goes directly from concrete into that gap in  
25 between the two.

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1                   These are three reasons we have identified  
2                   so far.

3                   CHAIRMAN WALLIS:   So what clogs this  
4                   drain?  You said the drain gets clogged?

5                   MR. ASHAR:  It is because of negligence on  
6                   the part of the various --

7                   CHAIRMAN WALLIS:  Yes.

8                   MR. ASHAR:  -- not to monitor them  
9                   correctly.  Now they have come to their senses.  And  
10                  they started telling us they are monitoring, they are  
11                  doing this, they are doing that.

12                  MEMBER BONACA:  The drains are down from  
13                  the sand cushions, right?

14                  MR. ASHAR:  They are separate.  After the  
15                  water leakage, it is the sand cushion area.  Then  
16                  there are drains to -- actually, those drains were  
17                  meant for making sure the scent does not go away.  And  
18                  if it is, then they can collect them and put them back  
19                  the same.  That was the whole idea behind it.

20                  But it has been used nowadays as a  
21                  water-collecting/catching kind of a thing.  It is an  
22                  indirect function of that particular drain, but that  
23                  shows that water is coming in.  If the drains into  
24                  that room, if it shows any kind of water in the Torus  
25                  room, then it shows that there is a water leakage from

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1 somewhere up above that is getting into that area.

2 CHAIRMAN WALLIS: It drains into the room  
3 around the Torus? It just drips down the wall  
4 somehow?

5 MEMBER SIEBER: Yes.

6 MR. ASHAR: The water comes from here.

7 CHAIRMAN WALLIS: That is a four-inch  
8 drain pipe. It just drains down the wall?

9 MR. ASHAR: This is a sand pocket here.

10 CHAIRMAN WALLIS: Where does it go to when  
11 it drains out of that four-inch drain pipe?

12 MEMBER SIEBER: Onto the floor.

13 CHAIRMAN WALLIS: It just drains onto the  
14 floor?

15 MR. ASHAR: Unless they are collectors.  
16 Some people have started collecting them into some  
17 kind of a jar. But most of them, yes, it was going  
18 onto the floor.

19 MS. TRAN: It goes onto the floor, yes.

20 MR. ASHAR: There is where they find out.

21 MEMBER BONACA: Now, some licensees have  
22 the drainage and some don't. That depends on the --

23 MR. ASHAR: Well, some licensees have  
24 drains of the sand pocket area here.

25 MEMBER BONACA: Down at the low point.

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1 MR. ASHAR: Some people have drains at  
2 this area somewhere on the top of it.

3 MEMBER SIEBER: I think all of them --

4 MR. ASHAR: And if it is on the top of it,  
5 then there has to be sealing between --

6 MEMBER SIEBER: All of them have the top.

7 MR. ASHAR: -- the concrete and the --  
8 yesterday we saw in the Monticello case, it was a  
9 seal, which was a galvanized steel shield between the  
10 sand pocket area and the above area. So it prevents  
11 the water from getting in.

12 MEMBER BONACA: The had a few ounces of  
13 water, too, at some point.

14 MR. ASHAR: Yes, yes.

15 MEMBER BONACA: So they must have come  
16 also from the top.

17 MR. ASHAR: In the case of Monticello,  
18 there were no signs like that. We did not see.

19 MEMBER BONACA: There were only a few  
20 ounces of water, they said.

21 MEMBER MAYNARD: Yes, but they speculated  
22 that that water had actually come from another source  
23 because of the two or three-inch sand pipe there.

24 MEMBER BONACA: On the sand pipe there,  
25 yes.

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1 MR. ASHAR: They could explain when you  
2 ask that question.

3 CHAIRMAN WALLIS: Well, if it drains down  
4 that four-inch drain pipe, I would assume that the  
5 sand is full of water.

6 MEMBER SIEBER: Yes.

7 MEMBER MAYNARD: Right. That is not the  
8 low point.

9 CHAIRMAN WALLIS: There is a lot of water  
10 there before it drains down the pipe. The sand  
11 pocket, the sand --

12 MR. ASHAR: The sand pocket has to be  
13 sucked up completely.

14 CHAIRMAN WALLIS: The sand cushion is  
15 saturated with water first.

16 MR. ASHAR: Right.

17 MEMBER SIEBER: A number of plants have  
18 drains at the bottom of the sand --

19 MR. ASHAR: At the bottom --

20 MEMBER SIEBER: It would make more sense  
21 to --

22 MR. ASHAR: Some people have at the bottom  
23 of the sand pocket area drains with -- again,  
24 actually, it is to retain the sand inside. So that  
25 all flowing sand can be collected, but if they can use

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1 it at the --

2 MEMBER SIEBER: What is the purpose of the  
3 sand in the first place?

4 MR. ASHAR: Okay. See, this is the --

5 MEMBER SIEBER: Got a cushion?

6 MR. ASHAR: -- concrete area -- okay? --  
7 here. And this one when the shell expands under  
8 pressure --

9 MEMBER SIEBER: It is room to --

10 MR. ASHAR: -- it gives you some room to  
11 budge in.

12 MEMBER SIEBER: Expand? Okay. But the  
13 whole bottom of the shell sits on concrete? So you  
14 don't worry about corrosion below the sand?

15 MR. ASHAR: We do in some cases. We do to  
16 some extent, yes. If --

17 MEMBER SIEBER: How do you address that?  
18 You can't get to it because the top of it is concrete,  
19 too.

20 MR. ASHAR: If there is an appreciable  
21 collection of water in the sand bucket area, there is  
22 a chance that the water might have gone between the  
23 steel shell and the concrete.

24 MEMBER SIEBER: Right.

25 MR. ASHAR: But those cases, we have not

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1 found many so far except one, one case.

2 MEMBER SIEBER: You probably don't know --

3 MR. ASHAR: Yes, sir.

4 MEMBER SIEBER: -- you've got a concrete  
5 pad, a hemispherical pad, and then concrete above  
6 that.

7 MR. ASHAR: Right.

8 MEMBER SIEBER: And so there's no way to  
9 make a measurement.

10 MR. ASHAR: We know.

11 MS. TRAN: The interior.

12 MEMBER SIEBER: You can't get to the  
13 inside unless you cut the concrete out.

14 MR. ASHAR: Unless you cut the concrete or  
15 there are some new methods that have been developed in  
16 the NRC's research program, which have guided matters,  
17 but they are not yet being calibrated and haven't been  
18 used extensively by anybody.

19 So there are potential uses for those  
20 things under these examinations, but we have not seen  
21 them use it so far. We have just put one report from  
22 Oak Ridge National Lab in e-mail items so that people  
23 can look at that report and see if it is applicable  
24 for them.

25 CHAIRMAN WALLIS: Didn't someone yesterday

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1 say they actually made holes in that concrete in order  
2 to inspect?

3 MR. ASHAR: Yes.

4 MS. TRAN: Monticello.

5 MEMBER SIEBER: Next to the pedestal.

6 MR. ASHAR: Yes. They had to do that.

7 MEMBER SIEBER: But that is about as far  
8 as you can go because --

9 MR. ASHAR: That is as far as you can go  
10 right now, right.

11 MEMBER SIEBER: It's really thick in  
12 between.

13 MR. ASHAR: Yes. You can go up to here in  
14 the sand pocket area. Anything below that, if there  
15 is a --

16 MEMBER SIEBER: Of course, the sump is in  
17 there, too.

18 VICE CHAIRMAN SHACK: But typically,  
19 though, I mean, your experience is that there is no  
20 water there or that they all collect water?

21 MR. ASHAR: Typically the water has been  
22 very little. There has been water except in one case  
23 in the case of, I think it is, Dresden III, when they  
24 had to put firewater in here to extinguish a fire in  
25 the gravel area here --

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1 VICE CHAIRMAN SHACK: Well, that would do  
2 it.

3 MR. ASHAR: -- because of a summation  
4 fire. I don't know why.

5 MEMBER SIEBER: Good place to get a fire.

6 MR. ASHAR: But there was a fire there.  
7 They put a lot of water into it. And this whole area  
8 becomes soft here in the sand --

9 CHAIRMAN WALLIS: I'm interested to see  
10 when the sand gets full of water by some mechanism how  
11 it ever gets out. How does it ever get dry?

12 MR. ASHAR: With sand you --

13 CHAIRMAN WALLIS: If you had water access,  
14 suppose the bellows fails --

15 MR. ASHAR: Except the temperature --

16 CHAIRMAN WALLIS: -- water runs down.

17 MEMBER SIEBER: Aren't there drains at the  
18 bottom of this thing pushing it, right?

19 MR. ASHAR: Some have. This one is not  
20 shown here. There is a drain right here.

21 CHAIRMAN WALLIS: There is a drain there?

22 MR. ASHAR: There is a drain.

23 MEMBER SIEBER: Okay.

24 CHAIRMAN WALLIS: So that is how you draw  
25 out the sand? You just let it soak out?

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1 MEMBER SIEBER: It drips into where the --

2 MR. ASHAR: The temperature in the drywell  
3 in general in that area is close to about 130-140  
4 degrees. So it helps a little bit drying --

5 CHAIRMAN WALLIS: It evaporates the water?

6 MR. ASHAR: To some extent, not -- I mean,  
7 I have been given those explanations by various  
8 applicants, I know, what does this, but I do not  
9 believe everything they say. But --

10 CHAIRMAN WALLIS: Okay.

11 MS. TRAN: Slide five, please.

12 MEMBER SIEBER: You say the space between  
13 the concrete and the shell and the drywell is filled  
14 with insulation.

15 MR. ASHAR: Yes, there is insulation in  
16 there.

17 MEMBER SIEBER: What is it, some kind of  
18 fiber of some sort?

19 MR. ASHAR: I think so, yes. In one case  
20 we found that insulation was bad enough that it has  
21 chloride and all those contaminants. So when the  
22 water came in, it came with contaminated water. And  
23 that started accelerating the corrosion rate.

24 MEMBER SIEBER: That would do it. The  
25 insulation holds the water all up and down.

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1 MR. ASHAR: Up and down.

2 MR. GILLESPIE: Hans, I think it is  
3 important here that we're not talking in every case  
4 about any single containment.

5 MR. ASHAR: Right.

6 MR. GILLESPIE: What you have hit on is  
7 exactly what I tried to say in the beginning. The  
8 specific designs are so variant that we have really  
9 found out in doing these reviews that a Mark I  
10 containment is not a Mark I containment when you're  
11 looking at the drain details and the drain location.  
12 It's a function of the age, the AE. And, for example,  
13 Nine Mile actually put cameras up to ten-inch drains  
14 that they have and looked up in there, and it was  
15 dust.

16 And so before we assume that this thing is  
17 always full of water on everyone, there is a great  
18 variance between each unit. The design is different.  
19 And what licensees have done in the past to verify  
20 either the presence or absence of water is very  
21 different.

22 And so it's not like there is a universal  
23 answer to each one of these. Each one really is  
24 different.

25 VICE CHAIRMAN SHACK: Now, again, just on

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1 that, are all of the ones filled with insulation or  
2 are some of them actually air gaps?

3 MEMBER ARMIJO: I thought Monticello was  
4 an air gap based on yesterday's presentation.

5 MR. ASHAR: It is called air gap. I mean,  
6 in general, the terminology used is air gap.

7 VICE CHAIRMAN SHACK: But, I mean, is it  
8 typically filled with insulation?

9 MR. ASHAR: Typically it is a concrete  
10 General Electric design. It has the insulation in  
11 most cases. There might be a plant or two that may  
12 not have it available, but there might be some plants.

13 MEMBER SIEBER: You almost need it to be  
14 the form for pouring the concrete.

15 MR. ASHAR: Right, exactly.

16 MEMBER SIEBER: You need something in  
17 there to do that. Otherwise you don't have a gap at  
18 all. And one of the ways you get water down there is  
19 you have to take that refueling seal out after you  
20 refuel in order to put the drywell back together. And  
21 the process of doing that leaves a lip of water --

22 MR. ASHAR: Right.

23 MEMBER SIEBER: -- all around where the  
24 seal --

25 MR. ASHAR: Right.

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1 MEMBER SIEBER: -- used to be. It can  
2 only go down.

3 CHAIRMAN WALLIS: Now, we had a plant  
4 recently which had bulges in this realignment.

5 MR. ASHAR: I want to clarify two things.  
6 Okay?

7 CHAIRMAN WALLIS: It was Brunswick.

8 MR. ASHAR: There is a problem with the  
9 terminology. The first thing, when we talk about the  
10 drywell shell, it is a freestanding drywell steel  
11 shell. And when we talk about the liner, it is  
12 attached to concrete with some kind of anchorages.

13 And that is where we use the word "liner."  
14 But I have seen people using very loosely "drywell  
15 liner" here. It is not true. Okay? We are going to  
16 clarify the terminology in the next -- there is no --

17 MEMBER SIEBER: The one plant that has the  
18 liner, the shell, the structural member is the  
19 concrete, the subject of the code.

20 CHAIRMAN WALLIS: Yes, that's right.

21 MEMBER SIEBER: So you can tolerate some  
22 amount of corrosion as long as you --

23 CHAIRMAN WALLIS: So the liner just sits  
24 on the --

25 MEMBER SIEBER: -- maintain tightness.

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1 CHAIRMAN WALLIS: Okay. So the liner sits  
2 on the concrete, which is why it bulges.

3 MEMBER SIEBER: Just in that one plant.

4 CHAIRMAN WALLIS: This one is  
5 freestanding, this one.

6 MEMBER SIEBER: Yes.

7 MR. ASHAR: The one we are showing is a  
8 freestanding shell plus the liner.

9 MS. TRAN: Okay. Slide five. For some  
10 applications, just the information provided was  
11 included in the various sections of the LRA. And for  
12 other applications, the information was obtained to  
13 request for additional information.

14 As a result, the proposed ISG recommended  
15 that future applicants provide a plant-specific aging  
16 management program that would address the loss of  
17 material for the accessible area of the drywell shell.

18 So the recommendations that the applicant  
19 should be included in there, in the aging management  
20 program to develop a corrosion rate that is really  
21 inferred from past UT examination or establish a  
22 corrosion rate using representative samples in similar  
23 operating condition.

24 CHAIRMAN WALLIS: I would think the  
25 corrosion rate was so low that it would be difficult

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1 to measure. Really, you could say that it's less than  
2 a certain amount.

3 MS. TRAN: Less than, then. No minimum  
4 design.

5 CHAIRMAN WALLIS: That's good enough. You  
6 don't actually want them to determine what it is  
7 because you might be so low that you can't measure it.  
8 But if it's less than a certain amount, that would be  
9 acceptable, wouldn't it?

10 MR. ASHAR: In general, subsection IWE of  
11 the ASME code allows close to about ten percent  
12 allowance --

13 CHAIRMAN WALLIS: I know, but --

14 MR. ASHAR: -- some localized corrosion.

15 CHAIRMAN WALLIS: But if there is no water  
16 there, the corrosion rate may be essentially zero.

17 MS. TRAN: Correct.

18 CHAIRMAN WALLIS: And so establishing a  
19 zero thing is very difficult to do.

20 MEMBER SIEBER: Really, what you are  
21 trying to do is to determine how close you are to  
22 min wall.

23 MR. ASHAR: The min wall, right, minimum  
24 wall.

25 MEMBER SIEBER: And by plotting the

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1 reduction in thickness, you can determine when you are  
2 going to hit min wall. At that point you no longer  
3 meet the code for that pressure vessel.

4 VICE CHAIRMAN SHACK: How do I do this?  
5 Do I have to have multiple UT readings from that  
6 inaccessible portion of the shell? Can I demonstrate  
7 that mine is always dry?

8 MEMBER MAYNARD: You could develop a way  
9 that you had data from the --

10 MR. ASHAR: Two in the same location.

11 MEMBER MAYNARD: If an applicant comes in  
12 and they don't have previous data, I'm not sure how  
13 they develop a rate.

14 MS. TRAN: This is what we learned in  
15 putting this together. They will have one point at  
16 the beginning, you know, the design of the fabrication  
17 point. And then as a result of generic letter 87-05,  
18 most applicants, I mean, yes, have another data point.  
19 So when using that, they could develop some kind of --

20 VICE CHAIRMAN SHACK: Again, that is very  
21 specific. How many data points did they take when  
22 they made those UT measurements? How many locations?

23 MS. TRAN: Eighty-seven? Do you know?

24 MR. ASHAR: Yes. Generally in response to  
25 87-05, a number of -- now I have to say licensees, not

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1 applicants -- licensees have taken that kind of  
2 approach that they will look at four points in four  
3 sectors --

4 VICE CHAIRMAN SHACK: Four quadrants.

5 MR. ASHAR: -- because they don't remove  
6 the sand. They just have the sand. It's not like  
7 Oyster Creek. So what they do is they chip out the  
8 concrete in certain areas and then take the  
9 measurements and in response to 87-05.

10 And the second reading they take is two  
11 years or so after. That gives them a closer rate at  
12 the same location. It isn't delicate science that,  
13 hey, something is going on. Then they do more work.

14 VICE CHAIRMAN SHACK: Now, again, from  
15 Monticello, they don't seem to have maintained those  
16 as access ports.

17 MEMBER SIEBER: No.

18 MR. ASHAR: No, they don't. I mean, they  
19 can get to it if they have to, but they don't maintain  
20 them because they --

21 MEMBER SIEBER: That becomes another  
22 pocket for corrosion --

23 MR. ASHAR: Yes, right. It becomes --

24 MEMBER SIEBER: -- because there is  
25 moisture inside the containment.

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1 MR. ASHAR: Right.

2 MEMBER SIEBER: In the sump is actually  
3 that floor there. The sump is built into the floor.  
4 And so every loose water, amount of water, ends up in  
5 that space where the drywell liner and the concrete  
6 meet.

7 So they have to fill it up. They have to  
8 do something. Otherwise you would have a pocket of  
9 water sitting there.

10 CHAIRMAN WALLIS: I am still a little  
11 puzzled. I would think that the corrosion rate is so  
12 low that it's within the uncertainty in the ultrasound  
13 measurements.

14 MR. ASHAR: If it is low, they will report  
15 as low.

16 MS. TRAN: At least we will have --

17 MEMBER SIEBER: Carbon steel water and --

18 CHAIRMAN WALLIS: There's no water there.

19 MR. GILLESPIE: As it happens with real  
20 applicants, we're looking at corrosion rates like 17,  
21 18 ml a year in some cases.

22 CHAIRMAN WALLIS: There is water there.

23 MR. GILLESPIE: Well, yes. And people are  
24 seeing some evidence of corrosion. In another case,  
25 Nine Mile case, they did these measurements. And then

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1 they have a high-corrosion area on mild carbon steel  
2 at the water line in the Torus.

3 And what they did was they took that rate  
4 as a conservative estimate, where they know water is,  
5 and applied it to their liner and say, "Okay. We've  
6 got 38 years to go here."

7 And so people actually have come up with  
8 ways given these points and other representative  
9 carbon steel areas within their area that they do  
10 measure because they're in harsher environments and  
11 applied that as a representation to this in order to  
12 show that they could make it past the renewal period  
13 or at least until the next measurement that they might  
14 commit to take.

15 And so so far each licensee that we have  
16 had an opportunity to both finish our review or  
17 interface with so far has actually been extremely  
18 consistent with this position. And so they have  
19 actually figured out how to do it.

20 And there is other carbon steel in the  
21 Torus, actually in a wet environment, which gives you  
22 a noticeable rate, as it happens, particularly where  
23 some of the liners have blistered and bubbled, which  
24 is a whole other issue, that they can apply to this.

25 It's a conservative application. You

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1 know, if it doesn't work, then they have to do  
2 something else to convince us that the rate is okay.

3 So when we talk the nebulous philosophy,  
4 it gets harder, but I think when you get to specific  
5 plant situations, pardon the pun, but it's concrete.  
6 And so they have kind of come up with ways to use the  
7 generic point, the generic letter issue points.

8 In fact, in Vermont Yankee's case, they  
9 actually had leakage and did extra measurements  
10 consistent with the ISP, which wasn't issued when they  
11 did this some years ago. And so they have preserved  
12 those extra points.

13 And so it just happens that these plants  
14 actually have this information sitting there. They  
15 just haven't used it in this application before. And  
16 this is clarifying. We expect you to use it in this  
17 application.

18 Go ahead, Linh.

19 MS. TRAN: I guess now where degradation  
20 has been identified in accessible area of the drywell,  
21 meaning in the interior area of the drywell, the  
22 applicant should provide an evaluation that would  
23 address the condition of the inaccessible area of a  
24 similar condition or find something in the interior  
25 area. They should have an evaluation for that.

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1 Now, to assure --

2 MEMBER APOSTOLAKIS: How does one do that?

3 MR. ASHAR: Let me. The actual, this is  
4 just what we have seen.

5 MEMBER APOSTOLAKIS: That's okay. You  
6 don't have to show it.

7 MR. ASHAR: Okay. This is the requirement  
8 we set in after when we endorsed IWE, IWL into  
9 50.55(a) in the rule, that if they find something in  
10 the accessible area, they ought to go and look in the  
11 surrounding inaccessible area to see if there is  
12 anything going on.

13 A lot of PWR licensees, for example, have  
14 found that at the junction of the steel liner of the  
15 concrete containment and the concrete floor, they have  
16 moisture barriers generally. And their moisture  
17 barrier gets damaged. The borated water many times go  
18 in. And it starts corroding the inside area. It  
19 shows up a little bit on the upper side.

20 So they would do examination and find out  
21 what is going on. And they find the moisture barrier  
22 could be the culprit. They have to change the  
23 culprit. They ought to go inside. They ought to take  
24 out the corrosion.

25 So that's the reason this problem has been

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1 in about the inaccessible. In accessible area you  
2 have corrosion. You would look into the joining  
3 inaccessible area to find every --

4 MEMBER APOSTOLAKIS: You will look into  
5 the inaccessible area. That helps make it accessible  
6 or not?

7 MR. ASHAR: No. If you see some rusting  
8 or something on the --

9 MEMBER APOSTOLAKIS: You can look at it.  
10 Why isn't it accessible?

11 MR. ASHAR: No, no. The whole area is  
12 that you see something in an accessible area. And  
13 they investigate as to what is going on underneath  
14 that particular area. The basic focus in the room was  
15 the PWR containments. That is where it was found in  
16 so many of them. And still we are finding it.

17 MEMBER ARMIJO: But it is possible you  
18 could have damage occurring in an inaccessible area  
19 and have nothing in the accessible.

20 MR. ASHAR: That's quite right.

21 MEMBER SIEBER: Possible.

22 MR. ASHAR: That is why this type of --

23 MEMBER ARMIJO: Very possible. I mean,  
24 it's --

25 MS. TRAN: That is why we use accessible

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1 area as the indication for the accessible area for the  
2 augmented inspection. They have to do visual in the  
3 surface. And then if the surface area is accessible  
4 only from one side and they have to protect the wall  
5 thing by using ultrasonic --

6 MEMBER ARMIJO: I don't worry about the  
7 accessible. I just worry about the inaccessible and  
8 having no way of knowing just by looking at the  
9 accessible area. It's not a good --

10 MR. ASHAR: That is where this ISG kicks  
11 in because this ISG is focused on inaccessible area.  
12 This is one of the pointers, that if there is  
13 something going on in the accessible area, which you  
14 can see right away, then there is something going on  
15 and you will look at it.

16 MEMBER ARMIJO: That is the easy part.

17 MR. ASHAR: The ISG concentration, focus  
18 of this ISG, is the inaccessible areas.

19 MEMBER APOSTOLAKIS: But how does one  
20 suspect?

21 CHAIRMAN WALLIS: Yes, that's right. How  
22 does one suspect?

23 MEMBER APOSTOLAKIS: How do you suspect?

24 MS. TRAN: You find water or leakage on  
25 your --

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1                   MEMBER APOSTOLAKIS: That is getting back  
2 to what Dr. Armijo is saying. That's not our worry.  
3 What if you don't find water? You still make some  
4 problem in the inaccessible area. Is that correct?

5                   MEMBER ARMIJO: Yes, you could.

6                   MEMBER APOSTOLAKIS: So how does one  
7 suspect that something is going on in the inaccessible  
8 area?

9                   MEMBER BONACA: No. She says water.

10                  MS. TRAN: Water is one. If you find  
11 water in the drain lines, water in the drain line, in  
12 the --

13                  MEMBER BONACA: For example, if the seals  
14 -- I guess you are focusing on the seals and on the  
15 bellows, right?

16                  MR. ASHAR: Right.

17                  MEMBER SIEBER: The only way you can get  
18 water into the inaccessible area is to have it flow  
19 through the accessible area. So if you make a  
20 measurement in the accessible area --

21                  MEMBER APOSTOLAKIS: Okay. That is a  
22 different --

23                  MEMBER SIEBER: -- that gives you some  
24 kind of justification to extrapolate to the area you  
25 get.

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1 MEMBER APOSTOLAKIS: But that doesn't help  
2 much because it could have run down --

3 VICE CHAIRMAN SHACK: The water runs down  
4 and collects at the --

5 MEMBER SIEBER: Right.

6 VICE CHAIRMAN SHACK: It doesn't stay on  
7 the side of the --

8 MEMBER BONACA: That is why the real focus  
9 is the last bullet. And that's what they attempted to  
10 do, you know, to put in the seals and the bellows in  
11 the scope of license renewal. And this has been kind  
12 of debated with the industry.

13 CHAIRMAN WALLIS: This is a very weak  
14 statement, "if moisture is suspected." That's a very  
15 subjective --

16 MS. TRAN: Or detected.

17 CHAIRMAN WALLIS: If you have a suspicious  
18 nature, you would suspect it all the time.

19 MR. ASHAR: Subsection IWE in its  
20 IWE-1240, there's a number of items. This is the  
21 abbreviated form. A number of places where this could  
22 occur is very vividly described in there, IWE-1240 in  
23 the ASME code. And that is what we are invoking, but  
24 we did not write everything that is written in the  
25 IWE-1240.

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1 MEMBER APOSTOLAKIS: Now, you are really  
2 including SSCs that are identified as source of  
3 moisture and scope, source of moisture?

4 MR. ASHAR: Yes. For example, cracking of  
5 bellows.

6 MEMBER SIEBER: The refueling seal.

7 MR. ASHAR: I explained to you earlier.

8 MEMBER APOSTOLAKIS: Okay. That's what --

9 MS. TRAN: The refueling seal is not.

10 MR. ASHAR: Refueling seal.

11 MS. TRAN: So they have to put that in the  
12 scope of license renewal.

13 MR. ASHAR: This is what we are --

14 MEMBER APOSTOLAKIS: Okay.

15 CHAIRMAN WALLIS: Why don't they just  
16 require that they check the bellows for cracks  
17 routinely?

18 MR. ASHAR: It is not very easy to get to  
19 it. They can do tests. That's what they do most --

20 MEMBER SIEBER: It not the only place it  
21 can leak.

22 MR. ASHAR: Yes. And I say --

23 MEMBER SIEBER: They can leak along the  
24 edge.

25 MR. ASHAR: Yes. And this is what we want

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1 to have them in the scope of license renewal, so they  
2 maintain them in a condition where it is not leaking.

3 MEMBER MAYNARD: Well, by "suspected"  
4 here, don't you really mean if there has been some  
5 previous evidence that moisture has been there? You  
6 know, I suspect. I have a hard time dealing with what  
7 I might suspect, but I can deal with whether I have  
8 had any indications or evidence.

9 MS. TRAN: Yes. This is "suspect" or  
10 "detected" through your drain lines.

11 CHAIRMAN WALLIS: Well, if moisture is  
12 detected, now, that makes sense.

13 MEMBER MAYNARD: Yes.

14 MS. TRAN: It should be "detected,"  
15 instead of "suspected."

16 VICE CHAIRMAN SHACK: So if moisture has  
17 been detected any time in the life of this plant up  
18 until license renewal included? Is that what it says?

19 MEMBER APOSTOLAKIS: It is not really  
20 detected. Go ahead. You answered my question.

21 CHAIRMAN WALLIS: Well, just take out the  
22 "if" clause and say, "include."

23 VICE CHAIRMAN SHACK: Yes. Why not just  
24 include them?

25 MEMBER APOSTOLAKIS: I think "suspected"

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1 is broader because would that include a situation  
2 where you have seen moisture or water in a similar  
3 facility and you suspect it may happen in yours, even  
4 though you hadn't seen it? "Suspected" is broader.

5 MEMBER MAYNARD: Well, yes, but I think  
6 from a regulatory standpoint and from dealing with  
7 licensees, I think you need a little bit better  
8 definition rather than it just being somebody's  
9 opinion sitting there saying, "Well, I suspect there  
10 might be something there."

11 CHAIRMAN WALLIS: Suspected by whom?  
12 Inspector or is it --

13 MEMBER MAYNARD: Well, I like the  
14 "detected" or --

15 MS. TRAN: Detected. I think --

16 MEMBER BONACA: We had a discussion  
17 yesterday at Monticello that shows how difficult the  
18 issue is. I mean, we rely very much on subjective  
19 judgments and say, "Well, we don't think we ever had  
20 water."

21 CHAIRMAN WALLIS: You could simply say  
22 that "The ACRS suspects that there may always be water  
23 there. Therefore."

24 MEMBER APOSTOLAKIS: You guys must have  
25 had a hell of a meeting yesterday.

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1 VICE CHAIRMAN SHACK: In Monticello's  
2 case, they see no evidence of corrosion in '87, which  
3 was a fairly substantial operating period for them.

4 MEMBER APOSTOLAKIS: That's right.

5 MS. TRAN: Identified.

6 MEMBER ARMIJO: If they have good records,  
7 they have a good sound --

8 VICE CHAIRMAN SHACK: One data point.

9 MR. ASHAR: We have to draw things --

10 MEMBER ARMIJO: They don't have to do it.

11 MS. TRAN: So just to get back on --

12 CHAIRMAN WALLIS: You really fixed this  
13 up.

14 VICE CHAIRMAN SHACK: Why not just put  
15 these seals in scope and be done with it?

16 MR. ASHAR: This is what we tried to do  
17 earlier. And there is so much resistance from a  
18 number of applicants. I mean, I had to go to three or  
19 four RAIs over and above a lot of teleconferences to  
20 convince them to put this in the scope of license  
21 renewal. And so many people denied.

22 CHAIRMAN WALLIS: So now you have to  
23 convince them to suspect something?

24 MR. ASHAR: No. Now, with this ISG, if  
25 they have suspected sites, areas, then --

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1 CHAIRMAN WALLIS: But they don't want to  
2 do it anyway. They'll never suspect anything.

3 MEMBER APOSTOLAKIS: No. Presumably there  
4 will be some guidance what suspicion means.

5 MR. ASHAR: There is a guidance.

6 MEMBER APOSTOLAKIS: Yes.

7 MR. ASHAR: There is.

8 CHAIRMAN WALLIS: There must be.

9 MEMBER APOSTOLAKIS: It just doesn't say  
10 it in bullets.

11 MS. TRAN: Yes.

12 MR. ASHAR: I was looking for IWE-1240  
13 here. I don't have one.

14 CHAIRMAN WALLIS: Okay.

15 MR. ASHAR: But that is where it is fully  
16 described as to -- this is what we are invoking here  
17 basically.

18 CHAIRMAN WALLIS: You want to say  
19 something, "if there are indications of moisture" or  
20 something like that.

21 MR. KUO: If I may, Part 54 rule in the  
22 rule language in the SOC discussed this, saying if a  
23 component is in an environment that could have aging  
24 effect, say in the operating experience, anywhere in  
25 the industry or your specific plant, that there is

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1 such a degradation mechanism, degradation mechanism  
2 that could cause an aging effect, then an aging  
3 management program should be provided. That's what  
4 the Part 54 rule requires.

5 In other words, if this is a possible  
6 aging effect from the operating experience, then that  
7 is suspected. You would use the word "suspect." That  
8 happened before. We should not talk about the  
9 hypothetical aging effect, but it is an aging effect  
10 that we have seen before.

11 VICE CHAIRMAN SHACK: Right. That is why  
12 I can't understand why you can't just put the seals in  
13 scope. I mean, it's not a hypothetical event.

14 MR. KUO: Like Hans said, some people  
15 don't want to include the seal in the scope.

16 CHAIRMAN WALLIS: There are often people  
17 who don't want to do things, but you can say, "Do it."

18 MEMBER BONACA: What you want and what you  
19 get are two different things.

20 MR. GILLESPIE: I think you will find as  
21 a result of this ISG, fundamentally seals are in  
22 scope. Remember, seals and the refueling stuff are  
23 not safety basically. And so what we're doing is  
24 because of the effect of non-safety components on a  
25 safety component, we're bringing them into scope. So

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1 it's a bit indirect.

2 And so it shouldn't be a surprise that  
3 utilities don't want extra requirement on things that  
4 don't have any requirements on them now.

5 MEMBER BONACA: But, you know, one thing  
6 that we are learning from this license renewal process  
7 as we converge, it seems to me that the central issues  
8 are becoming the inaccessible or buried components  
9 that you can't look at, that you cannot measure. And  
10 that's natural because, I mean, these plants are going  
11 beyond some original design in certain components of  
12 the -- and I think that it is important that we focus  
13 on these inaccessible components and ask our  
14 questions, you know, how long can this live and what  
15 is the source of the problem. And here -- anyway --

16 MS. TRAN: Hans wanted me to read the  
17 IWE-1241, the examination surfaces, "Surface area for  
18 the typical location," "Typical location of such areas  
19 of those exposed to stand-in water, repeated wetting  
20 and drying, persistent leakage, and those with  
21 geometries that permit water accumulations,  
22 condensation, and biologicals attack." I mean, it is  
23 in the -- it tells the applicant the area.

24 Now, let's say if moisture is detected as  
25 suspected or identified --

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1 (Laughter.)

2 MS. TRAN: Now, we will agree that they  
3 found water. Okay? So they should include the  
4 component, the source of it, in the scope of license  
5 renewal. In addition, we need to identify the surface  
6 area.

7 Next slide. By implementing and  
8 augmenting inspection for the period of extended  
9 operation in accordance with the ASME section 11,  
10 subsection IWE and also for the examination shall be  
11 in accordance with section 11, subsection IWE-2500.  
12 And I did go over that a little bit earlier.

13 That means that surface area accessible  
14 from both sides should be visually examined and  
15 surface area that is only accessible from one side  
16 should be examined for wall thinning and using sonic  
17 thickness measurement method.

18 Now, after all of that, after all of the  
19 augmented inspection, the applicant should demonstrate  
20 that either corrosion is not occurring by performing  
21 those examinations or analysis to do analysis on the  
22 result or that corrosion is progressing so slowly that  
23 the age-related degradation will not jeopardize the  
24 intended function of the drywell to the period of  
25 extended operation.

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1 VICE CHAIRMAN SHACK: Just how thick is  
2 this light bulb again?

3 MR. ASHAR: The light bulb? It varies.  
4 From the top, it is thinner, very thin, right around  
5 half-inch to three-quarter-inch. As you go down near  
6 the knuckle area between the sphere and the upper  
7 part, it is spherical area. It is close to about .7,  
8 .6 inches. Then it again goes down up to six inches.  
9 And then at the bottom area is about one to one and a  
10 half inches in between the sand pocket area --

11 VICE CHAIRMAN SHACK: No. But, I mean,  
12 it's 17 ml a year.

13 MR. ASHAR: Oh, yes.

14 VICE CHAIRMAN SHACK: You're going to chew  
15 that at a pretty good clip.

16 MEMBER BONACA: If you find a hole in the  
17 liner, I mean, would you suspect some moisture there?  
18 I mean, what is --

19 CHAIRMAN WALLIS: Even my chassis of my  
20 car, which is soaked in salt, doesn't corrode at 17 ml  
21 per year, does it? It's really bad conditions if  
22 you've got --

23 MR. GILLESPIE: Yes. That actually is the  
24 two worst points that a particular --

25 CHAIRMAN WALLIS: Yes, very bad --

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1 MR. GILLESPIE: -- that they reported to  
2 us. What it does do, though, is say there is  
3 operating history out there in this utility  
4 environment, that we cannot take for granted that it  
5 can't happen.

6 CHAIRMAN WALLIS: Right.

7 MR. GILLESPIE: And that's the reason for  
8 the ISG. We are not going to make the assumption  
9 because we have operating history that says it's not  
10 necessarily a valid assumption in all cases that it's  
11 going to go slow. There has been evidence of this  
12 going faster than people would have originally  
13 anticipated in the designs.

14 MEMBER BONACA: But in some cases where we  
15 have questioned the bellows, particularly the seals,  
16 if you're in seals, then the answer is always, well,  
17 we have good drainage. So you are in a quandary. I  
18 mean, what leads you --

19 MR. ASHAR: There are a number of things  
20 that tells us. The first thing, the drains are not  
21 clogged any time in the past. The second thing,  
22 visual examinations performed in the areas, it was  
23 shown there are no telltale signs of water for a  
24 number of inspections there performed. Then they had  
25 to show us at the bottom in the drain line there was

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1 no water coming out anywhere.

2 So there are so many things that they  
3 would tell us before they convince us that there is  
4 nothing going on.

5 MR. GILLESPIE: Mario, I would also say  
6 that I think this came up in Monticello's case  
7 yesterday, --

8 MR. ASHAR: Right.

9 MR. GILLESPIE: -- where they didn't take  
10 credit for it, but they actually had a primer sprayed  
11 on the outside of the inaccessible area. And other  
12 licensees have different applications of codings on it  
13 also.

14 And so it's not one thing.

15 MEMBER BONACA: Yes, I know, but --

16 MR. GILLESPIE: Aging management is  
17 accumulation of codings, time of exposure, amount of  
18 water.

19 MEMBER BONACA: And the spray on the  
20 surface was 65 or 40 years ago practically, 1965. So,  
21 you know, right. I understand.

22 MR. GILLESPIE: But the environment is not  
23 such that there is anything in there to actually cause  
24 the paint to peel off either. So there's no one issue  
25 here.

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1 MEMBER BONACA: Yes. I understand.

2 MR. GILLESPIE: It's different pieces to  
3 try to give you reasonable assurance.

4 MEMBER BONACA: In fact, yesterday at the  
5 end of the conversation, it was the lady who was  
6 performing the inspections felt confident with that.  
7 I'm sure that if you go physically and look at it and  
8 get information, you know, you can build a credible  
9 case that there is no concern with moisture. So I  
10 accepted that yesterday.

11 MEMBER ARMIJO: But a case has to be made  
12 --

13 MEMBER BONACA: Yes, it does.

14 MEMBER ARMIJO: -- with documented data,  
15 not just --

16 MEMBER BONACA: Right.

17 MEMBER MAYNARD: Is there something that  
18 is done periodically to ensure that these drains are  
19 really open, like particularly the sand point drains  
20 and stuff, that they're not plugged in some way?

21 MR. ASHAR: Now they are committing to  
22 those things. They have ensured those things, yes.

23 VICE CHAIRMAN SHACK: You'll find out when  
24 you have a leak.

25 MEMBER SIEBER: A sand pocket drain is a

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1 four-inch pipe. So they're hard to plug.

2 VICE CHAIRMAN SHACK: Yes.

3 MEMBER BONACA: I believe we have also  
4 some comments from the industry.

5 MS. TRAN: Right. Yes.

6 MEMBER BONACA: So shortly we'll get to  
7 those.

8 MS. TRAN: I am almost done. Now, if the  
9 intended function of the drywell cannot be met, the  
10 applicant can identify actions that will be taken as  
11 part of the aging management program to ensure that  
12 the integrity of the drywell would be maintained  
13 through the period of extended operation.

14 Last slide. Now, the drywell shell  
15 concern has already been addressed for the reactor's  
16 initial 40 years' licenses and relevant plants that  
17 have received a renewal license, as indicated in the  
18 left column there.

19 Now, the staff is in the process of  
20 reviewing the plants in the middle column. And the  
21 third column represented the remainder of the plants  
22 with the Mark I steel containment design.

23 Not all the plants in the third column,  
24 however, have announced their intention to renew their  
25 license, but the future review that's listed on the

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1 right side.

2 This concludes my presentation. So we can  
3 entertain any additional questions that you might  
4 have.

5 MEMBER BONACA: You don't have to request  
6 questions.

7 CHAIRMAN WALLIS: Ell, I suspect there  
8 might be some more questions.

9 (Laughter.)

10 MEMBER SIEBER: I don't know what they  
11 would be that we haven't already asked.

12 MEMBER BONACA: Any additional questions?

13 (No response.)

14 MEMBER BONACA: None. So we thank you for  
15 a very good presentation.

16 MS. TRAN: Thank you.

17 CHAIRMAN WALLIS: You have been here all  
18 day, Alex.

19 MR. MARRION: I know. Can I get one of  
20 those little name tag things? I'll just put it on.

21 (Laughter.)

22 MR. MARRION: Good afternoon. My name is  
23 Alex Marrion. I'm Senior Director of Engineering with  
24 NEI. And with me I have James Ross, who is the senior  
25 project manager with lead responsibility for license

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1 renewal. He's here to keep me out of trouble. He  
2 should have been here earlier.

3 I just want to make a couple of general  
4 comments. Based upon comments that the NRC made about  
5 the uniqueness of the specific plant designs, we feel  
6 that this is not really a generic issue, but it's  
7 appropriate to address it on a plant-specific basis in  
8 accordance with the uniqueness of the designs. And I  
9 think Frank Gillespie brought that up.

10 This is not a new issue. It's been  
11 addressed by the licensees in the past. There was a  
12 generic letter, 8705. And inspection requirements  
13 were incorporated into NRC regulations when NRC  
14 endorsed the ASME code subsection IWE as part of an  
15 update of 10 CFR 50.55(a).

16 Because that was already regulatory  
17 requirements, utilities were resisting the idea of  
18 imposing an additional regulatory requirement given  
19 that there wasn't sufficient evidence to indicate that  
20 the current requirement was not adequate if that makes  
21 sense.

22 The particular interim staff guidance is  
23 out for comment. Right now comments are due the 8th  
24 of June. We intend to submit comments on behalf of  
25 the industry.

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1           Most of the comments will be of a  
2 clarifying nature to make sure we understand the  
3 language, et cetera, which brings me to a more generic  
4 communication process issue. You know how I feel  
5 about generic communications based upon comments I  
6 made earlier.

7           The one thing that is not clear to us as  
8 an industry is why there is a need for an ISG process  
9 to begin with given that the NRC already has a  
10 well-established generic communication process that  
11 could be used as a vehicle for communicating staff  
12 guidance going forward.

13           So now we have generic communications.  
14 And we also have interim staff guidance, two separate  
15 processes that basically overlap. So we're going to  
16 continue making that point with every opportunity we  
17 have.

18           Lastly, I understand some question has  
19 been raised about the idea of continuing or the idea  
20 of imposing ultrasonic testing requirements. I want  
21 to make it clear that the current requirements that we  
22 currently have are for a graded approach to a visual  
23 examination.

24           And depending upon what you find, you do  
25 a more comprehensive examination, but the first step

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1 is a visual. And that's basic --

2 CHAIRMAN WALLIS: How do you visually  
3 inspect these inaccessible areas?

4 MR. MARRION: Well, as you heard from the  
5 staff, you do an examination of the inaccessible areas  
6 based upon what you find of the accessible areas if I  
7 have characterized it properly in what the staff was  
8 proposing.

9 And for the Mark I's, we intend to  
10 continue that process going forward. And we will be  
11 commenting accordingly on the ISG comments.

12 CHAIRMAN WALLIS: You have to be able to  
13 access some place which is relatively typical of the  
14 inaccessible places in order to do that.

15 MR. MARRION: Yes. I'm not familiar with  
16 the details of what that is, yes.

17 That's all I have, sir.

18 MEMBER ARMIJO: I just think that is  
19 fundamentally unsound because you have, really, a  
20 crevice condition in that sand pocket area. It's not  
21 at all represented by the accessible area.

22 And so looking at a safe location to make  
23 a judgment of a susceptible location seems to me a  
24 waste of time. I mean, if the accessible area is  
25 highly corroded, you can be sure that the inaccessible

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1 is in bad shape.

2 MR. MARRION: Right.

3 MEMBER ARMIJO: But the converse isn't  
4 true.

5 MEMBER APOSTOLAKIS: But didn't Jack say  
6 that for the water to get to the inaccessible area, it  
7 has to go through the accessible areas?

8 MEMBER ARMIJO: Yes, but it doesn't stay  
9 there.

10 VICE CHAIRMAN SHACK: It doesn't stay  
11 there.

12 MEMBER ARMIJO: It flows.

13 VICE CHAIRMAN SHACK: You have got a drain  
14 right at that thing. I mean, there is no way for  
15 water to really accumulate --

16 MEMBER APOSTOLAKIS: It is not  
17 accumulating.

18 VICE CHAIRMAN SHACK: -- in that  
19 accessible area.

20 CHAIRMAN WALLIS: But it gets to the sound  
21 --

22 MEMBER APOSTOLAKIS: But you are going to  
23 see some moisture or something.

24 MEMBER ARMIJO: You can make a case that  
25 if it's always been dry, that's your best case. You

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1 have good data.

2 MEMBER MAYNARD: I thought part of that,  
3 it would depend on what you include as a visual area  
4 for what you base -- if you're including the drains  
5 and if there is any moisture coming out of the sand  
6 drains or anything like that, well, that might be  
7 appropriate. But if you're saying that all you have  
8 to do is just visually look at the inside of the  
9 container there, that you don't have to do anything  
10 else.

11 But if you include as part of what you  
12 find visually results of drains and other things --

13 MR. MARRION: That is a comprehensive  
14 examination requirement that's in 50.55(a) right now.

15 Thank you. And I appreciate the time I  
16 spent with this illustrious body today.

17 (Laughter.)

18 MEMBER KRESS: We are honored to have you.

19 MEMBER BONACA: If there are no further  
20 questions, first of all, I want to thank the staff for  
21 their presentations and for the information. And then  
22 I'll turn the meeting back to you, Chairman.

23 CHAIRMAN WALLIS: Thank you very much.

24 We are finished with our formal  
25 presentations for the day.

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1 MEMBER KRESS: We don't have a letter on  
2 this particular issue?

3 MEMBER BONACA: No.

4 MEMBER KRESS: This was just a briefing?

5 CHAIRMAN WALLIS: Just a briefing. It was  
6 just a briefing.

7 MEMBER BONACA: There is no impact  
8 because, I mean, it was helpful because, again,  
9 yesterday we had a --

10 CHAIRMAN WALLIS: We don't need that --

11 MEMBER KRESS: Are we going to give some  
12 feedback now or anything on what we've heard or do you  
13 think the questions are sufficient?

14 VICE CHAIRMAN SHACK: The questions were  
15 sufficient.

16 CHAIRMAN WALLIS: Unless you have another  
17 point you want to make. Do you want to make some  
18 point?

19 MEMBER KRESS: Well, my point was that I  
20 just don't like this round-about way of doing things  
21 in the sense that I think there's a fatal flaw in  
22 trying to use the accessible areas to determine  
23 whether or not there is a problem in the inaccessible  
24 areas.

25 I would do what Bill Shack just said. Why

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1 not just include those sources of moisture within the  
2 scope?

3 VICE CHAIRMAN SHACK: Well, I think --

4 MEMBER KRESS: I know it has been resisted  
5 by the industry, but it doesn't seem like that big of  
6 a burden to me. I think that's the real solution.  
7 And that's what they're after, but they're trying to  
8 do it in a round-about way.

9 VICE CHAIRMAN SHACK: I also think a  
10 techie could come up with a way to measure those  
11 thicknesses.

12 MEMBER KRESS: Show me that way, and that  
13 may be okay. That's possible.

14 MEMBER SIEBER: Well, when you put the  
15 refueling seal in the scope, all you're doing is  
16 establishing an aging management program for that.  
17 That doesn't prevent leakage necessarily because there  
18 may be something other than the aging that causes the  
19 leaking.

20 MEMBER KRESS: Okay. Maybe. Maybe I am  
21 flawed.

22 MEMBER SIEBER: You could twist it, and  
23 now it leaks.

24 CHAIRMAN WALLIS: You should probably  
25 inspect a more susceptible area, which is a sand

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1 pocket.

2 MEMBER SIEBER: I think you have to deal  
3 with the --

4 MEMBER BONACA: In the past we left it to  
5 the --

6 MEMBER SIEBER: -- rather than deal with  
7 something that is removed from it.

8 MEMBER BONACA: In the past we left it to  
9 a licensee to have a choice. For example, in Browns  
10 Ferry, the staff was asking for inspection of the  
11 seals. They fought that. We left them open, either  
12 that or UT the liner in the vulnerable locations. And  
13 they chose to UT the liners.

14 The burden is inaccessibility because  
15 there is going to be that every ten years. And when  
16 they do the ISR, they are in containment. And they  
17 physically can then perform most of the utilities in  
18 those locations. So we left open those possibilities.

19 I take your point, and I think the  
20 Committee should decide. Should we have a comment on  
21 this or -- the intent wasn't one of providing a  
22 letter. This was an informational presentation, but  
23 --

24 CHAIRMAN WALLIS: I think the staff has  
25 heard our comments. It was a preliminary sort of

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1 thing. And that is probably good enough for now.

2 MR. GILLESPIE: We appreciate the comments  
3 because, as Mario said, underground cabling, piping,  
4 and this kind of large passive component are really  
5 becoming kind of the end point. Everything else we  
6 know how to deal with for the most part.

7 But I will say in this case -- and let me  
8 take Browns Ferry. You might say, well, why did  
9 Browns Ferry choose UT versus the seals. Browns Ferry  
10 actually had unidentified sources of leakage. And he  
11 said versus trying to identify every source of leakage  
12 because they didn't know where it was that their  
13 cheapest way out was actually to do the UT.

14 But they got the idea that we wanted to  
15 wait. And you had to assure us this thing was going  
16 to be okay relative to thickness.

17 VICE CHAIRMAN SHACK: That sand pocket is  
18 pretty big. I mean, you can have a fair amount of  
19 moisture in there that you're never going to see  
20 coming out of those drains. And, yet, you could have  
21 attack over a reasonable fraction of that.

22 MEMBER SIEBER: There are oodles of  
23 surface in there for the moisture to collect on.

24 MR. GILLESPIE: But, again, the locations  
25 of the drains are plant-specific. Some plants have

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1 seals, as Monticello had over it. Some places have a  
2 liner or coding on the other side of the surface.

3 VICE CHAIRMAN SHACK: Well, a bottom drain  
4 would give me a whole lot more comfort than that top  
5 drain would.

6 MR. GILLESPIE: Yes. The other thing is  
7 the sand is very compacted.

8 MEMBER KRESS: Have you ever tried to  
9 drain moisture out of the sand from the bottom? It  
10 doesn't come out.

11 MR. GILLESPIE: I don't want to pooh-pooh  
12 it, but the idea that this is a 130-degree area also  
13 --

14 VICE CHAIRMAN SHACK: You drive it out  
15 with --

16 MR. GILLESPIE: And so you're going to  
17 drive it out. And so you've actually got the occasion  
18 to get water in there about 20 days every 18 months or  
19 24 months depending on the fuel cycle someone is on  
20 and how long it's flooded. And that's why we've  
21 started to key into visual. You might say, visual  
22 leakage from someplace kicks you into needing to do a  
23 UT.

24 Now, what this inter-staff guidance  
25 position does do is says the identification of

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1 moisture, basically leakage, is equivalent to the  
2 visual recognition of accelerated corrosion on the  
3 inside. And that's an important distinction, which  
4 never existed before.

5 So for the inaccessible areas, we're using  
6 the indirect indication of seeing water as kind of an  
7 assumption that you have to do the same thing as if  
8 you saw accelerated corrosion on the inside. That  
9 gets us a measurement on an event basis.

10 And so someone who is sworn to keeping  
11 this thing dry, if they have an event during a  
12 refueling where they get leakage in there, now they're  
13 obligated to do something which is a bit more onerous  
14 and reestablish their rate.

15 It's not perfect. By the way, there are  
16 two inaccessible areas. We should be clear on that.  
17 There is the inaccessible area in the air gap. And  
18 then there's this inaccessible area that's layered on  
19 the bottom between the two concrete layers, which is  
20 really probably the most difficult area, but it was  
21 designed to last 40 years. It is totally lined with  
22 concrete. And then you've got this temperature  
23 gradient.

24 CHAIRMAN WALLIS: Is 40 years good enough  
25 with license renewal, though?

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1 MR. GILLESPIE: Now, it was originally  
2 designed for 40 years, but that was kind of an  
3 assignment. But now if you have no evidence of in  
4 leakage or water in there, I mean, again, it's  
5 indirect stuff. It's almost like a circumstantial  
6 case we're acting --

7 CHAIRMAN WALLIS: Concrete is not dry all  
8 the time.

9 MR. GILLESPIE: Concrete is porous  
10 material, and it is not dry all the time. And so then  
11 you could ask questions. A fair question in the aging  
12 management program is, what are you doing about  
13 groundwater? And do we have any evidence of  
14 groundwater?

15 We asked that from Nine Mile. And I think  
16 we're coming. I signed up the draft SE this morning.  
17 So I think next month we're probably coming on Nine  
18 Mile. They have actually got alarms on their drains  
19 if moisture is detected.

20 So every plant is doing some unique  
21 things.

22 CHAIRMAN WALLIS: Moisture can come out of  
23 the concrete. There is a lot of concrete. There is  
24 a late curing of the concrete which goes on for a long  
25 time. Then it can be damp. It doesn't have to be

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1 very damp --

2 MR. GILLESPIE: Right.

3 CHAIRMAN WALLIS: -- to produce some  
4 chemical reaction.

5 MR. GILLESPIE: What is the impact? This  
6 is what I don't know, is what is the impact of this  
7 temperature gradient.

8 CHAIRMAN WALLIS: You don't have oxygen.  
9 So that is probably what protects you.

10 MR. GILLESPIE: And so there is a number  
11 of things that -- we're doing our best, appreciate the  
12 Committee's comments, and more than happy. If anyone  
13 else has any better ideas, we would love to have them,  
14 but this ISG was an effort to send a benchmark for  
15 basically the best-performing plant on liners.

16 It has no moisture. What if you get  
17 moisture? How do you establish your rate? This is  
18 kind of putting out, in essence, that they now know we  
19 do expect a rate to even be established. We didn't  
20 have that in writing before.

21 CHAIRMAN WALLIS: We won't comment on it,  
22 and we hope it works out.

23 MR. GILLESPIE: Well, feel free to comment  
24 on it. We're happy to have comments. NEI is going to  
25 feel free to comment on it.

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1 CHAIRMAN WALLIS: We won't.

2 MEMBER BONACA: Certainly we will comment  
3 on individual applications.

4 MR. GILLESPIE: Yes. I do think this is  
5 middle ground we are wrestling with here because I do  
6 agree with Alex that the individual designs that we're  
7 applying this concept to are significantly different.  
8 In critical questions, like locations of drains, some  
9 are going to be more susceptible than others.

10 As I said, Browns Ferry said we have  
11 unidentified leakage. We know we have leakage. It's  
12 not a lot. UT is our answer. It's the only way that  
13 could give us positive confirmation.

14 CHAIRMAN WALLIS: Have they been having  
15 leakage on their reactor which has been shut down for  
16 all that period of time, unidentified leakage?

17 MR. GILLESPIE: Well, remember, we license  
18 units I, II, and III. The floor wasn't flooded on 1.  
19 So they haven't had any leakage on I for a long time.

20 CHAIRMAN WALLIS: They think they haven't.  
21 They could have an unidentified leakage.

22 MR. GILLESPIE: They had some unidentified  
23 leakage from refuelings in the other units, and they  
24 chose UT.

25 MEMBER SIEBER: They have them for fuel

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1 for --

2 MR. GILLESPIE: By the way, this is a very  
3 high-dose area, too. And so the question here isn't  
4 money.

5 MEMBER BONACA: Not only they. I mean --

6 MR. GILLESPIE: It's going to be dose.

7 MEMBER BONACA: Where the seals are, it's  
8 a very high red area.

9 MR. GILLESPIE: Yes.

10 MEMBER BONACA: Not down in the sand  
11 pocket.

12 MR. GILLESPIE: It depends on where you're  
13 at. You're directly under the vessel.

14 CHAIRMAN WALLIS: No one is going to go  
15 down there.

16 MR. GILLESPIE: My understanding from the  
17 licensees is from a radiological perspective, this is  
18 not an area you want to take lightly doing extra  
19 measurements over and above what you really need to  
20 confirm your --

21 CHAIRMAN WALLIS: BSBWR has hatches that  
22 you go in into the reactor pedestal area.

23 MEMBER BONACA: We were told by TVA that  
24 it is not a high red area because it is well below the  
25 --

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1                   MEMBER KRESS: Graham, I was wondering if  
2 the staff is considering a user need letter to  
3 Research to try to develop a way to do this more  
4 definitively, maybe strong on ultrasonics or  
5 something. Is there such a user need letter or any --

6                   VICE CHAIRMAN SHACK: Well, there is  
7 something from Oak Ridge now.

8                   MR. GILLESPIE: Actually, there is a  
9 letter report that just recently got put in ADAM from  
10 Oak Ridge, from a project that Research sponsored, but  
11 it is not commercially available yet. And, as best I  
12 understand it, it is a technique to calibrate for this  
13 concrete steel concrete sandwich.

14                   I think, as I understand it, there are  
15 three different alternative approaches to doing it.  
16 And so the information is starting to be developed and  
17 published. But we're probably years away from actual  
18 commercial application to go from the research bench  
19 to the --

20                   MEMBER KRESS: Yes, but you have got years  
21 to go to do it in. I mean, the corrosion rate is low  
22 enough that --

23                   MR. GILLESPIE: I am not disagreeing. If  
24 the Committee would like to -- we think we're actually  
25 pretty close right now on a plant-by-plant basis. But

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1 if the Committee would like to write a letter  
2 recommending a research project, it's okay. I don't  
3 mind. It's your Committee.

4 MEMBER SIEBER: The question is what do  
5 you want to cut out to pay for it.

6 MEMBER MAYNARD: I would like to just add  
7 on to Tom's previous comment just a little bit. It  
8 doesn't surprise me. And I would expect the industry  
9 to resist new requirements, new changes to things. I  
10 think it better to get the fight over, have it once,  
11 rather than a lot of times.

12 So, rather than dealing with a lot of  
13 things through staff guidance, generic letters, a lot  
14 of times it would be better if this is going to be a  
15 new expectation, new requirement, let's follow the  
16 process and make that -- you know, get the fight over  
17 with once, make it happen, rather than continually  
18 trying to go around these systems just generically.

19 MEMBER SIEBER: The requirement has always  
20 been there. And it stems from the code requirement.  
21 The question is, what do you do and how do you do it  
22 to give yourself a reasonable assurance that you're  
23 okay.

24 MR. GILLESPIE: The new aspect now is  
25 people having to articulate in an aging management

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1 program what they're going to do to ensure that their  
2 monitoring and measurement process for this liner will  
3 detect its approach to minimum wall thickness prior to  
4 it getting there.

5 I mean, that's really what plant license  
6 renewal is, to ensure that you have the additional  
7 monitoring programs in place that you will detect and  
8 correct prior to exceeding that minimum wall  
9 thickness.

10 The discussion of this ISG between us and  
11 the industry is evoked. I think it has now gotten us  
12 to a point where we have some actual cases under our  
13 belt that have now, you might say, set the standard  
14 for the next ones to come in.

15 And now we've got each plant evaluating  
16 itself against the plants we have already looked at  
17 and saying, "Am I like them? Am I different? If I'm  
18 different, then is it a positive difference or  
19 negative difference?"

20 And now we're starting to get those kind  
21 of aging management considerations into this piece of  
22 equipment, which we did not have, quite honestly,  
23 going in until we hit Browns Ferry.

24 The Committee wants -- Mario will remember  
25 this. I forget which BWR they were in. It was on the

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1 steam dryers. And I used the Committee. I quoted the  
2 Committee to the staff on the liner. And it was on  
3 the dryers.

4 And, Mario, I forget. You might have been  
5 the one who said it. You said it's large, it's  
6 passive, and you just wrote a generic letter saying  
7 it's safety. It wasn't in scope before that statement  
8 was made. It's now in scope. And, you know, the  
9 staff said it's large, it's passive, it has corrosion,  
10 and it's safety. And so now we're trying to take it  
11 on head on. I think with some success, you're seeing  
12 the applications getting it addressed at some level of  
13 credibility now.

14 MR. THADANI: Graham, I have one quick  
15 question.

16 Frank, you noted this is a high-dose area.  
17 This issue is one important in many ways, has I think  
18 rather minimal risk to public. How is that sort of  
19 balanced in terms of the actions called for and its  
20 relative importance?

21 MR. GILLESPIE: I think how we are trying  
22 to deal with that -- and we have got a meeting with  
23 one applicant day after tomorrow, Oyster Creek, on  
24 this, on our residual concerns after their RAIs. And,  
25 really, what we started talking about was the

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1       uncertainties involved in the decision.

2                   And so the question really is, how much  
3       should you pay for certainty in a decision? Because  
4       the significant measurement uncertainty and doing  
5       these UT exams, they're actually fairly coarse.

6                   There is uncertainty in primers and  
7       liners, which have exceeded, basically, the  
8       manufacturer-recommended lives of 10 to 15 years.  
9       Yet, they're still there. And they're still being  
10      inspected doing what they're doing.

11                  There is uncertainty in have you picked  
12      enough selected locations because we are looking for  
13      a general area degradation. We're not looking for  
14      just pitting.

15                  The Committee didn't mention it, but there  
16      are really two concerns. One is pressure retention  
17      and accident. And the other is buckling, the sheer  
18      collapsing of this thing under its own weight. And so  
19      you've got two reasons to inspect two different areas.

20                  And so I would suggest that in this ISG  
21      and what we're seeing from these utilities, we're  
22      actually accepting, you might say, a fair level of  
23      uncertainty in it to keep it rational.

24                  And so the safety consideration is in how  
25      much do we want to press people to make it more and

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1 more certain. And so that's really how we're  
2 factoring in the safety significance of it.

3 When I talk about dose and how many  
4 measurements need to be taken, we need reasonable  
5 assurance. And in many cases, there's not positive  
6 evidence on either side because this is a large  
7 passive thing that was put in there. It's expected to  
8 last forever fundamentally from the designer's point  
9 of view. We're confirming that assertion.

10 CHAIRMAN WALLIS: It probably will in most  
11 plants last.

12 MR. GILLESPIE: In most plants, I think it  
13 will. And so it's a confirmation. And so we're not  
14 designing the plant, which is very vigorous. We're  
15 confirming that the expected performance will be  
16 sustained. And we probably can be slightly less  
17 rigorous in the uncertainty we accept on that.

18 CHAIRMAN WALLIS: That is all the agency  
19 ever does. It doesn't design plants.

20 MR. GILLESPIE: Right.

21 CHAIRMAN WALLIS: It confirms performance.

22 MR. GILLESPIE: But you learn how much,  
23 what you're going to do in that confirmation.

24 MEMBER BONACA: Yes.

25 CHAIRMAN WALLIS: I think we may have gone

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1 over. We have gone over 15 minutes. I think it's  
2 about time we --

3 MEMBER BONACA: One last comment I had was  
4 that, you know, so many of the -- however the  
5 inspection processes we still depend on, for example,  
6 the visual inspection of this, we are still at the  
7 pace that really was conceived at the moment these  
8 plants are put in renewal. Okay? So every ten years  
9 they go in and look at it. Okay?

10 To me, you know, as these plants get older  
11 and older, these inaccessible areas, et cetera, you  
12 know, then maybe the frequency with which we're  
13 looking at it becomes more questionable because, you  
14 know, every ten years, a lot of things can happen.

15 CHAIRMAN WALLIS: Especially when you  
16 start to find things.

17 MR. GILLESPIE: We have occasions in  
18 several licensees where because they were sticking to  
19 a more extended inspection period, even when they had  
20 evidence of water, they did not consider evidence of  
21 water equivalent to accelerated corrosion visually.

22 So this ISG actually tries to take the  
23 principle you just espoused and says, "You can no  
24 longer in our expectation, staff's expectation, you  
25 can no longer ignore the presence of water. You have

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1 to now give us positive confirmation that the rate of  
2 degradation is still being minimized.

3 CHAIRMAN WALLIS: It is not boric acid.

4 MR. GILLESPIE: Yes, yes. At least we're  
5 dealing with a general moisture.

6 CHAIRMAN WALLIS: Right.

7 MR. GILLESPIE: And so this actually does  
8 go for that extended period to some incidents in which  
9 we actually have evidence from various licensees.  
10 They had evidence of water and basically did an  
11 engineering evaluation and did not obtain positive  
12 information if the thickness was okay.

13 MEMBER BONACA: What are you going to do  
14 when one of the already approved license renewals is  
15 going to come in for another license renewal?

16 MR. GILLESPIE: They have talked to us  
17 about that.

18 MEMBER BONACA: Well.

19 MR. GILLESPIE: I'm hoping to be retired  
20 by that point.

21 MEMBER BONACA: Anyway, I think we will  
22 see how this works.

23 MR. GILLESPIE: I started with the draft  
24 of the renewal rule in 1989 and have been doing this  
25 now for the last five years. At some point, someone

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1 else should do it.

2 MEMBER BONACA: All right.

3 MR. GILLESPIE: Thank you.

4 MEMBER BONACA: I give you back the  
5 meeting, Mr. Chairman.

6 CHAIRMAN WALLIS: We are ready to come off  
7 the record. Thank you very much for recording the  
8 meeting today, and we will take a break until a  
9 quarter to 5:00.

10 And when we come back, we will finish  
11 Mario's letter, which seems to be fairly  
12 straightforward. And then we will know where we are  
13 going with the other letter, hopefully know well  
14 enough that we can see our way to the end of it  
15 tomorrow.

16 (Whereupon, the foregoing matter was  
17 concluded at 4:34 p.m.)

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# Official Transcript of Proceedings

## NUCLEAR REGULATORY COMMISSION

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533rd Meeting

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS (ACRS)

533rd MEETING

+ + + + +

WEDNESDAY, MAY 31, 2006

+ + + + +

ROCKVILLE, MARYLAND

+ + + + +

The Subcommittee met in Room T2B1 at Two White Flint North, 11555 Rockville Pike, Rockville, Maryland, at 8:30 a.m., Graham B. Wallis, Subcommittee Chair, presiding.

MEMBERS PRESENT:

- GRAHAM B. WALLIS Chairman
- WILLIAM J. SHACK Vice Chairman
- GEORGE E. APOSTOLAKIS Member
- J. SAM ARMIJO Member
- MARIO V. BONACA Member
- RICHARD S. DENNING Member
- THOMAS S. KRESS Member
- OTTO L. MAYNARD Member
- JOHN D. SIEBER ACRS Member-At-Large
- JOHN LARKINS Designated Federal Official

1       ACRS STAFF PRESENT:

2       HANS ASHAR                       NRR

3       DANIEL FRUMKIN                   NRR

4       ALEX KLEIN                        NRR

5       THOMAS KOSHY                    EEEEB/DE/NRR

6       MICHAEL MAYFIELD                DE/NRR

7       GEORGE MORRIS                    EEBE/DE/NRR

8       LINH TRANS                        NRR

9       GEORGE WILSON                    NRR

10      ROBERT WOLFGANG                 NRR

11      ROY WOODS                         RES

12

13      ALSO PRESENT:

14      HAROLD BARRETT                 Duke Power Company

15      MIKE FALLON                     Constellation Energy

16      ALEX MARRION                    NEI

17      DAVID MISKIEWICZ                Progress Energy

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23  
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AGENDA ITEMS

PAGE

Opening Remarks, Chairman Graham B. Wallis . . . 4

Draft Final Generic Letter, "Post-Fire  
Safe-Shutdown Circuit Analysis  
Spurious Actuations" . . . . . 5

Draft Final Generic Letter 2006-XX,  
"Inaccessible or Underground Cable  
Failures that Disable Accident  
Mitigation Systems" . . . . . 149

Interim Staff Guidance on Aging Management  
Program for Inaccessible Areas of Boiling  
Water Reactor (BWR) Mark I Containment  
Drywall Shell . . . . . 195

Adjournment

## P R O C E E D I N G S

(8:31 a.m.)

CHAIRMAN WALLIS: The meeting will now come to order.

This is the first day of the 533rd meeting of the Advisory Committee on Reactor Safeguards. During today's meeting, the Committee will consider the following:

Draft Final Generic Letter, Post-Fire Safe-Shutdown Circuit Analysis Spurious Actuations, Draft Final General Letter, Inaccessible or Underground Cable Failures that Disable Accident Mitigation Systems, Interim Staff Guidance on Aging Management Program for Inaccessible Areas of Boiling Water Reactor Mark I Containment Drywell Shell, and Preparation of ACRS reports.

This meeting is being conducted in accordance with the provisions of the Federal Advisory Committee Act. Dr. John T. Larkins is the Designated Federal Official for the initial portion of the meeting.

We have received no written comments from members of the public regarding today's sessions. We have received a request from Alex Marrion, NEI, for time to make oral statements regarding the Generic

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1 Letter on Post-Fire Safe-Shutdown Circuit Analysis and  
2 the Generic Letter on Inaccessible or Underground  
3 Cable Failures that Disable Accident Mitigation  
4 Systems.

5 A transcript of portions of the meeting is  
6 being kept and it is requested that the speakers use  
7 one of the microphones, identify themselves, and speak  
8 with sufficient clarity and volume so that they can be  
9 readily heard.

10 I will begin with some items of current  
11 interest. In the items handed out to you, I notice  
12 that there is a speech by Commissioner Yatzko at the  
13 beginning. And at the end, there is an interesting  
14 article on various matters which complicate PWR sump  
15 evaluations.

16 Now in the middle of the day, we are going  
17 to have ethics training which is why the lunch break  
18 is so long today. And the ethics training is  
19 scheduled for between 12:15 and 1:30 so you should be  
20 here at 12:15 and ready to be trained in ethics.

21 That is the end of my prepared remarks.  
22 And I'd like to proceed with the meeting. Call on  
23 Rich Denning to get us started on the first item.

24 MEMBER DENNING: Thank you. We will be  
25 hearing from the staff regarding the draft final

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1 generic letter 2006-XX, Post-Fire Safety-Shutdown  
2 Circuit Analysis Spurious Actuations. The Committee  
3 will hear presentations by and hold discussion with  
4 representatives of the staff.

5 Additionally, Mr. Alex Marrion with NEI,  
6 has requested ten minutes to share NEI's perspective  
7 after the staff's presentation.

8 The Committee had requested to review the  
9 generic letter regarding Post-Fire Safe-Shutdown  
10 Circuit Analysis Spurious Actuations after the public  
11 comment period. We did not have a prior subcommittee  
12 meeting on this letter which may have been a mistake.

13 I have serious reservations about the  
14 balance between regulatory burden and approved safety  
15 associated with this letter. The letter leaves open  
16 options for risk informing this process but they are  
17 not easy activities to perform. So we are anxious to  
18 hear what the staff has to say on this. And to have  
19 a healthy discussion, I believe.

20 We have a considerable period of time  
21 actually to do this, three hours. But I think that we  
22 will want to look into this letter very carefully  
23 before giving our blessing.

24 I think we are now ready to hear from  
25 staff. And I'll turn it over to Alex Klein of the

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1 Office of Nuclear Reactor Regulation.

2 MR. KLEIN: Thank you very much. My name  
3 is Alex Klein. You see on the cover slide here my  
4 branch chief's name, Sunil Weekakkody. He extends his  
5 regrets for not being able to attend today's meeting  
6 in that he had a prior commitment for jury duty today.  
7 With that, I'm acting in his place so I will give the  
8 opening presentation.

9 The purpose of today's meeting and the  
10 presentation to the Committee is to present the final  
11 draft of Generic Letter 2006-XX, Post-Fire Safe-  
12 Shutdown Circuit Analysis Spurious Actuations. We are  
13 also here to obtain ACRS endorsement to issue the  
14 proposed generic letter.

15 I'd like to introduce the two primary  
16 staff members who will present today for NRR. To my  
17 left is Robert Wolfgang who is the primary author of  
18 the generic letter. And to my right is Daniel  
19 Frumkin, fire protection engineer, from the Office of  
20 NRR, who will speak to you about some of the NEI and  
21 EPRI fire testing.

22 We also have in the audience with us  
23 supporting staff members from NRR who were also  
24 instrumental in the development of this generic  
25 letter.

1           As an overview, I wanted to advise the  
2           Committee that there is a lot of history leading up to  
3           this generic letter. And you will hear some of this  
4           today. We did a bounding analysis, full of risk. We  
5           also did a regulatory analysis of the generic letter.  
6           But at this time, those slides are not in our  
7           presentation. But we are certainly prepared to  
8           discuss those aspects.

9           MEMBER DENNING: We absolutely would like  
10          to see those slides.

11          MR. KLEIN: Very good.

12          So the probability of spurious actuations  
13          due to fires will be presented by Dan Frumkin after I  
14          speak. And then after Dan speaks, we will receive a  
15          summary of the objectives of the generic letter by Bob  
16          Wolfgang.

17          Again, based upon the long history of this  
18          generic letter and so forth, there has been differing  
19          views between the industry and the NRC on the  
20          credibility of multiple spurious actuations. You will  
21          hear about the NEI/EPRI cable fire test results from  
22          Dan Frumkin, as I indicated.

23          I also wanted to indicate to the Committee  
24          that we are continuing with our inspections using  
25          risk-informed aspects. For example, RIS 2004-03,

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1 certainly one of the goals of issuing this generic  
2 letter is to reestablish compliance with the  
3 regulations.

4 That concludes my introductory remarks.  
5 And I'll hand over the presentation to Dan Frumkin.

6 CHAIRMAN WALLIS: When you present, could  
7 you make it clear to me just what it is you are asking  
8 industry to do because I had a lot of trouble figuring  
9 that out. There is a lot of sort of rather vague  
10 requirements it seems to me. And perhaps you can in  
11 your presentation make it clear just what it is they  
12 have to do.

13 MR. KLEIN: Yes.

14 MR. FRUMKIN: Good morning. My name is  
15 Dan Frumkin from the Office of NRR. I work for Sunil.  
16 And today I'm going to present some of the background  
17 from the NEI/EPRI testing that is discussed in the  
18 generic letter.

19 I see some new faces around the ACRS table  
20 so I'm going to pass around some tables from some  
21 testing that occurred. At the end of the cables that  
22 are fused together, you will be able to see two  
23 failure modes or examples of two failure modes. One  
24 is an inter-cable which is two cables -- or actually  
25 one is an intra-cable, which we use these terms intra

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1 within a single cable and inter between two separate  
2 cables. And this provides an example of both.

3 The highlighted portions within a cable  
4 are very close together that have failed together.  
5 And then we also have intruding cable that has  
6 penetrated the outer jacket and apparently the inner  
7 cable protection and come at least into very close  
8 contact which you can see.

9 We will talk also about the different  
10 types of cable. This is a thermal plastic cable,  
11 which is the more vulnerable cable, but as you can  
12 see, that it is subject to both failures from internal  
13 and external cables when put under the suitable heat  
14 or fire exposure.

15 So I'll be providing some background on  
16 the testing that provided the insight into the failure  
17 likelihoods, the objectives of that testing, some  
18 details of the testing, some of the test results, and  
19 a few conclusions based on the testing.

20 And then Mr. Wolfgang will be talking  
21 about the generic letter more specifically.

22 The NEI/EPRI testing was intended to  
23 address fire-induced circuit failure issues of concern  
24 to the NRC staff, principally the potential for  
25 spurious operations of equipment.

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1           This was intended to basically bring to  
2 close the question that the staff kept on bringing up  
3 that Browns Ferry had these and the industry said that  
4 well, it is very unlikely to occur. So this was  
5 intended to bring that to a close.

6           NRC witnessed the testing and also did  
7 some insulation resistant testing using Sandia  
8 National Laboratory resources.

9           And there are four documents that either  
10 in whole or in part document the results of some of  
11 the testing. The characterization of fire-induced  
12 circuit failures results is the big report from EPRI.

13           The circuit analysis failure modes and  
14 likelihood analysis is the Sandia Report of their  
15 insulation resistant testing.

16           These results were pulled into the NUREG  
17 6850, which is the fire protection re-quantification  
18 or the fire PRA methodology for nuclear power  
19 facilities. This is the state-of-the-art document  
20 that Research has developed to -- it is a handbook on  
21 how to do fire PRA.

22           And then there was the spurious actuation  
23 expert elicitation which was experts reviewing the  
24 testing and coming up with results.

25           The objectives, as I said, was to research

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1 the characteristics of fire-induced circuit failures  
2 to better understand these plants' responses to cable  
3 failures. And, as I said, the NRC also was involved  
4 in the testing and reviewed -- witnessed the testing  
5 and did their own insulation resistant testing.

6 So the details of the test, there were 18  
7 fire tests that were conducted between January 9th,  
8 2001 and June 1st, 2001 at the Omega Point  
9 Laboratories in San Antonio. And the three types of  
10 fire exposures were tested during the test. The hot  
11 gas layer region which is up at the ceiling level, the  
12 fire creates a buoyant plume and it fills the  
13 enclosure from the top down. And that is the hot gas  
14 layer.

15 Then below -- between the fire -- the  
16 actual fire and the hot gas layer is what we call the  
17 plume region where there is no flaming but that is a  
18 very hot part of the -- that is the hottest part of  
19 the smoke region of the fire.

20 And they also tested a radiant exposure  
21 where you get close to the fire itself or sometimes  
22 worst case could be up next to the plume region  
23 depending on emissivity of the smoke and the radiant  
24 energy coming off. If it is a clean burning flame, it  
25 may not have a high radiant energy but the smoke may

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1 be higher. So -- but they just used, I believe, a  
2 fixed radiant number but that is a little discussion  
3 of the radiant energy.

4 One thing that they didn't do that I will  
5 add is they did not put cables in the flaming region.  
6 That is why I have this highlighted. We, the staff,  
7 hear a lot from the licensees about how long it takes  
8 to have these cables fail. And that there is plenty  
9 of time in all situations for mitigation.

10 And based on the testing, yes, in a lot of  
11 the testing there was a lot of time before there was  
12 failure in, you know, 30, 40 minutes for some of the  
13 tests. But none of the tests tested this flaming  
14 region.

15 So this leaves the staff a very strong  
16 question of how fast -- well, first we don't know what  
17 failures will occur in that region. They could occur.  
18 They may not occur. We don't have the information.

19 It is very clear that if they do occur,  
20 they will occur much more quickly. The temperatures  
21 are over, you know, much -- a thousand degrees hotter  
22 in the flaming region. And there is also an ignition  
23 source. So it is a very different phenomenon. And  
24 cables could be exposed to a flaming region in the  
25 plant.

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1           So this test is not a complete picture of  
2           -- or let me just say that the timing factors that  
3           came out of the testing that was done are not a  
4           complete picture of the possible scenarios that could  
5           occur.

6           MEMBER APOSTOLAKIS: It appears that you  
7           were participating in the conduct of these tests. Did  
8           you express these concerns to EPRI when they were  
9           designing the tests?

10          MR. FRUMKIN: Well, I wasn't specifically  
11          involved in that. I don't believe that the test was  
12          intended to develop timing. And as such, it wouldn't  
13          have been an issue. The licensees or the industry has  
14          brought this timing issue and perhaps inappropriately  
15          based on the testing.

16          It is useful to heat this cable slowly  
17          because then the hot shorts would probably exist for  
18          a longer period of time. But whether this -- but my  
19          only point is that I don't believe that this testing  
20          provides a basis to say that hot shorts -- this test  
21          I don't think was intended or can provide a basis for  
22          timing. But I believe it is being applied or some  
23          intend to use it to show that there is a timing issue.

24          MEMBER APOSTOLAKIS: I would be such an  
25          obvious thing to do. I mean there must be a reason

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1 why they didn't do it. Do you know that? Or should  
2 we ask Mr. Marrion when he comes?

3 MR. FRUMKIN: Why they didn't do the  
4 flaming region? Yes, that is a fair question. But I  
5 believe the answer -- like I said, I do think that  
6 that was not -- if there hadn't been any failures  
7 outside of flaming region, I think there would have  
8 been a strong feeling that failures in the flaming  
9 region would have been maybe less likely. But it is  
10 a fair question.

11 MEMBER APOSTOLAKIS: Okay.

12 CHAIRMAN WALLIS: Does the material from  
13 which the insulation is made, does that actually burn  
14 at some temperature?

15 MR. FRUMKIN: Yes.

16 CHAIRMAN WALLIS: But if you stuck it in  
17 a flame, you would expect the insulation itself to  
18 catch fire.

19 MR. FRUMKIN: Yes. The ASTM -- or, I'm  
20 sorry, the IEEE 383 fire test that has been the  
21 standard fire test is actually a burning test. And it  
22 ignites the flames from the bottom in a vertical cable  
23 tray. And all the cables do catch on fire when  
24 exposed to flame. But some of them propagate more or  
25 less slowly.

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1           There are some specialized cables that  
2 don't catch on fire but those were not tested. Those  
3 aren't what we are talking about here.

4           So the results of the tests showed with  
5 some confidence that failures within multi-conductor  
6 cables are likely and when they do occur, they occur  
7 in multiple conductors within the same multiple  
8 conductor cable. So as you can see from that cable  
9 bundle, there may actually be more than one cable  
10 conductor within the cable further down the jacket  
11 that you can't see.

12           And then the way they are spiraled  
13 together in there so that various cables could come in  
14 contact with other cables within the same cable.  
15 Various conductors could come into contact with other  
16 conductors within the same cable.

17           In addition, multiple devices were shown  
18 -- the spurious actuation data showed that a single  
19 hot short within a multi-conductor cable usually  
20 effected actuation devices simultaneously. If there  
21 were two devices -- I believe the way they set this  
22 test up is they wanted a very practical approach.

23           So they actually put -- rather than doing  
24 similar to the Sandia testing where they used an  
25 insulation-resistance device, they used actual plant

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1 equipment, which they just plugged it in as they would  
2 in the plant and if it would actuate or not actuate.  
3 So it was a real pragmatic thing and they did actuate.  
4 And as the testing showed, some actuated  
5 simultaneously.

6 MEMBER MAYNARD: Did they also measure how  
7 long the signal stayed there? Or how long it  
8 actuated?

9 MR. FRUMKIN: Yes. And most of the hot  
10 shorts were of a short duration. And some were in the  
11 order of minutes, I believe.

12 This is a table of results of the best  
13 estimates given cable damage of a spurious actuation  
14 probability. And the purpose of this table is not to  
15 -- the purpose of this table is just to show that the  
16 NRC and the industry -- or at least the results from  
17 the EPRI report which was developed by industry, are  
18 very consistent.

19 The staff and the risk people in industry  
20 really are on the same page with the likelihood of  
21 spurious actuations. There are some factors of two  
22 here, differences, but in probabilistic and  
23 likelihoods, in that world it is a small difference.

24 CHAIRMAN WALLIS: This is strange to me.  
25 It must depend on the extent of the damage. I mean if

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1 you just burn a cable for a short time, nothing  
2 happens. If you burn it for long enough, you are  
3 going to get shorts. So you can't just have a  
4 probability. It is going to depend on the extent of  
5 the damage to the cable.

6 MR. FRUMKIN: Yes. In all these, cables  
7 were exposed to damage. So this is given that these  
8 cables were damaged.

9 CHAIRMAN WALLIS: But to what extent?

10 MEMBER APOSTOLAKIS: It is a critical  
11 probability. I mean -- or, as you said earlier --

12 PARTICIPANT: At some point the  
13 probability is one, right?

14 MEMBER APOSTOLAKIS: I mean there is a 0.6  
15 conditional probability that you will have a spurious  
16 actuation. This is conditional on the probability  
17 that the cable is damaged.

18 MR. FRUMKIN: Correct.

19 MEMBER APOSTOLAKIS: And what is that?

20 MR. FRUMKIN: That depends on the  
21 scenario. For example, if a cable is a foot above a  
22 piece of switch gear or let's say -- and this is not  
23 an unlikely situation -- a foot above 20 or 30 feet of  
24 switchgear. It runs across the cable tray, across the  
25 top of a number of pieces of switchgear, what is the

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1 probability?

2 Well, that could be calculated typically,  
3 I think, a single piece of switchgear is five times E  
4 to the minus five. Or, you know, in that range. But  
5 then it certainly would be damaged if there was even  
6 a small fire in that piece of switchgear.

7 So there is -- you could have cable -- and  
8 then that same cable does go through different areas  
9 where it could be exposed to different other fires.  
10 A single cable could go through three, four, five  
11 different areas and be exposed to a dozen different  
12 fire scenarios.

13 MEMBER DENNING: I think we have to  
14 recognize the context within which this is done,  
15 George. And I think it is important when we try to  
16 get into the question of risk informing this and that  
17 is basically we are doing a deterministic safe  
18 shutdown analysis in which you assume there is a fire  
19 in a zone -- in a fire area. And it can burn there  
20 for three hours. You know even though there are other  
21 mitigating things that would clear that, we assume it  
22 can burn for three hours.

23 So then the question is well, with this  
24 massive potential exposure, then you have got a cable  
25 running through there. What's the potential that it

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1 could then be heated up to a point at which you get  
2 this kind of interaction? You know it doesn't get at  
3 all into the questions of you have a fire in a room,  
4 what is the possibility that any cables are exposed,  
5 you know, before it is controlled.

6 MEMBER APOSTOLAKIS: But if we are doing  
7 a deterministic analysis, why are we calculated  
8 spurious actuation probabilities?

9 MEMBER DENNING: Well, let me give my view  
10 but I'd certainly like to hear your view, and that is  
11 that the question is not so much whether you can have  
12 spurious actuations but how many can you have? How  
13 many combinations of things can you deal with?

14 The industry has always agreed to looking  
15 at a spurious actuation on a one-at-a-time basis, you  
16 know. And so I think that what the staff is trying to  
17 do is to give the feeling that -- or their impression  
18 that this isn't the really rare event -- the extremely  
19 rare event that actually would have some kind of  
20 spurious actuation occurring.

21 And then I think by implication then maybe  
22 there is the potential for multiple spurious  
23 activations.

24 MEMBER APOSTOLAKIS: Well, the second  
25 bullet of the previous slide, I guess, is then the

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1 key, right? Is that what -- of devices?

2 MEMBER DENNING: Well, I would be curious.  
3 What is your -- if you were answering that question,  
4 how would you have answered George's question? Why  
5 are we looking at probabilities here now?

6 MR. FRUMKIN: Well, okay, maybe this slide  
7 was poorly planned. But the point of the slide is  
8 twofold. One is to say that with regard to  
9 probabilities, the staff and the industry people who  
10 do this work are on the same page.

11 And the second reason, I guess, is to show  
12 that these probabilities are very high in  
13 probabilistic space, that some of them are close --  
14 you know, 0.6, and then if you have a 0.6 scenario and  
15 you have two 0.6 scenarios, you've got a 0.36  
16 scenario. So that even multiple can be a fairly high  
17 probable.

18 MEMBER DENNING: Now help us though -- you  
19 can't say that without giving some conditionality of  
20 --

21 MR. FRUMKIN: Right.

22 MEMBER DENNING: -- 0.6 conditions on  
23 what?

24 MR. FRUMKIN: Cable damage.

25 MEMBER DENNING: Cable damage.

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1 MEMBER ARMIJO: I have a problem with  
2 cable damage. Is this severe? Moderate? I have no  
3 feeling of -- I can see where all the insulation is  
4 burnt to a crisp and I would call that severe.  
5 Wouldn't these probabilities all be one?

6 MR. FRUMKIN: No. Well, okay, so what  
7 this is talking about is the spurious actuation  
8 probability, not shorting situation. This is the  
9 likelihood of a hot short occurring within a cable  
10 without that cable shorting to its conduit or cable  
11 tray because generally once the hot conductors fail to  
12 the conduit or cable tray or the nearest ground, then  
13 they would certainly -- that would clear the spurious  
14 actuation.

15 MEMBER MAYNARD: Okay. But I think there  
16 is a high probability if you make all the assumptions  
17 to get to this point. But you also have to factor in  
18 the probability of actually having a fire, for the  
19 fire going that long, for the operators not taking any  
20 action. There are a lot of other things getting up to  
21 that point that when you put it all in context --

22 MEMBER APOSTOLAKIS: That is why I'm  
23 confused. We are either doing deterministic analysis  
24 or we are doing risk analysis. If we do risk  
25 analysis, then, of course, we have to do all this. If

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1 we do what Rich said, then it seems to me they are  
2 gone.

3 I mean you have three hours. Everybody is  
4 burning, right? I think as I recall from the early  
5 studies on this the real question is whether you will  
6 have a short -- a hot short first before an open  
7 circuit.

8 MR. FRUMKIN: Right. Before the short  
9 ground.

10 MEMBER APOSTOLAKIS: That is the critical  
11 thing.

12 MR. FRUMKIN: Yes.

13 MEMBER APOSTOLAKIS: And this is not  
14 answering that, is it?

15 MR. FRUMKIN: Yes, it is.

16 MEMBER APOSTOLAKIS: It is?

17 MR. FRUMKIN: This is the likelihood of  
18 that spurious actuation probability, not a short to  
19 ground.

20 MEMBER APOSTOLAKIS: Okay.

21 CHAIRMAN WALLIS: This is one spurious  
22 actuation.

23 MR. FRUMKIN: This is a single.

24 CHAIRMAN WALLIS: A single one although  
25 there are multiple wires in the cable?

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1 MR. FRUMKIN: Right. Well, this is a  
2 spurious actuation getting cable to damage within a  
3 cable or between -- there is an inter-cable factors  
4 here -- between two cables. So the point -- let's  
5 just say the 0.6 here is for within a single thermoset  
6 cable, the 0.2 or the 0.4, as the 6850 has it, is  
7 between -- or generally it is 0.3 is what has been  
8 used a lot -- is between two separate thermoset cables  
9 within the same tray.

10 And what the previous slide was trying to  
11 say is that within a single thermoset -- within a  
12 single multi-conductor cable, that more than one of  
13 the conductors are going to fail together with an 80  
14 percent likelihood. So it almost for sure that if  
15 let's say you have one hot conductor and four control  
16 conductors that could actuate four different pieces of  
17 equipment, that hot conductor will come into contact  
18 probably with all of them with the same likelihood,  
19 with this same 0.6.

20 CHAIRMAN WALLIS: Oh, with the same  
21 likelihood?

22 MR. FRUMKIN: Yes. It's not a 0.6 times  
23 0.6 times 0.6 in the same cable. Within that cable it  
24 is 0.6 times 0.8, if you will.

25 CHAIRMAN WALLIS: Okay.

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1 MR. FRUMKIN: So it is still -- it is  
2 almost 0.6.

3 MEMBER DENNING: Why are the inter-cable  
4 probabilities the same for thermal plastic and  
5 thermoset?

6 MR. FRUMKIN: Because -- oh, you mean this  
7 and this?

8 MEMBER DENNING: Yes.

9 MR. FRUMKIN: Inter-cable -- yes, I'm not  
10 -- that's just a -- well, intra-cable is very likely  
11 --

12 MEMBER DENNING: Intra-cable, I understand  
13 that.

14 MR. FRUMKIN: Yes, I don't -- I don't have  
15 --

16 CHAIRMAN WALLIS: What is the question,  
17 Rich?

18 MEMBER DENNING: It's thermoset is less  
19 likely -- one would think thermoset would be less  
20 likely to have inter-cable and perhaps they are the  
21 same here because there just haven't been any  
22 experiments done on a thermoset.

23 MR. FRUMKIN: I think that is it because  
24 you can see that that is one of the big differences,  
25 a factor of two here, and again the same factor of two

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1 for intra-cable -- inter-cable -- but yes, we're -- as  
2 Roy Woods is here, and we're doing more testing on  
3 this. But this is currently the state-of-the-art data  
4 on this.

5 And I can't explain the -- it's just that  
6 is what the data showed from the limited 18 tests.

7 CHAIRMAN WALLIS: Now we are talking about  
8 whether you are doing probabilistic or deterministic  
9 analysis. When we get to the generic letter, there  
10 are strange terms such as saying the licensee must  
11 assume the possibility of simultaneous multiple  
12 spurious actuation -- well that tells me nothing.

13 I'm assuming the possibility -- it says  
14 nothing about whether it is likely to be one or 0.6 or  
15 whatever.

16 MEMBER DENNING: What they are saying is  
17 one.

18 CHAIRMAN WALLIS: What does it mean?

19 MEMBER DENNING: It means one.

20 CHAIRMAN WALLIS: So possibility means a  
21 probability of one?

22 MEMBER DENNING: That's -- yes.

23 CHAIRMAN WALLIS: That wasn't clear to me  
24 at all. Okay.

25 MEMBER APOSTOLAKIS: We will come to the

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1 letter, I guess.

2 MEMBER DENNING: Yes. Continue.

3 MR. FRUMKIN: These are just some notes on  
4 the previous slide that some of the plants that use  
5 the CPTs, which are the control power transformers,  
6 that reduces the likelihood of spurious actuations.

7 MEMBER APOSTOLAKIS: All of these  
8 probabilities, of course, mean nothing now.

9 MR. FRUMKIN: Right, yes.

10 MEMBER APOSTOLAKIS: They are one.

11 MR. FRUMKIN: Okay. Well --

12 MEMBER DENNING: But we are going to get  
13 to risk informing at some point here.

14 MR. FRUMKIN: Absolutely. Right. So  
15 those were just notes on the previous slide which was  
16 unfortunately put in here.

17 In conclusion, a review of the test data  
18 readily illustrates that hot shorts often involve more  
19 than one conductor. And that concurrent hot shorts  
20 within a cable are probable and should be considered  
21 during circuit analysis.

22 That's the end of this presentation. And  
23 the point of this is just to lay the groundwork that  
24 simultaneous spurious actuations and simultaneous  
25 multiple spurious actuations have been shown by

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1 testing, by industry testing, to occur.

2 MEMBER DENNING: Now there is more testing  
3 that is in progress. It is your feeling that that  
4 testing could then -- will it be done within a time  
5 period where we add value to the licensee when the  
6 licensee is basically responding the generic letter?

7 MR. FRUMKIN: Yes, that testing is planned  
8 to be done by the end of the year. And that pool of  
9 data will be available -- certainly for risk-informed  
10 evaluations for the licensees to use. But the experts  
11 doing the testing don't believe that there is going to  
12 be -- they believe these numbers are going to be  
13 honed.

14 They believe that there are going to be  
15 more cable combinations tested here than in the 18  
16 EPRI tests -- EPRI/NEI tests. But they don't believe  
17 that for the information that was on that table are  
18 going to be changed by an order of magnitude. It's  
19 maybe a 50 percent change or something of that nature.

20 MEMBER DENNING: If we have time later on,  
21 could we have a short presentation by someone about  
22 what is still to happen? And what different  
23 configurations basically have been untested at this  
24 point that will be tested?

25 MR. FRUMKIN: Well, Roy Woods is sitting

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1 behind you. And I'm not sure if he is prepared to  
2 talk about this testing.

3 MEMBER DENNING: Let me say I'm not asking  
4 for you to do it right now. But do you think you  
5 could do it later?

6 MR. WOODS: Sure. Roy Woods, RES. Yes,  
7 certainly we can make a presentation to you whenever  
8 you want on the testing. The plans are well made. We  
9 are about to start within days or a week at most. It  
10 is actually about to happen.

11 MEMBER DENNING: Okay. Well, let's go  
12 ahead --

13 MR. FRUMKIN: I think they want something  
14 later this morning, right?

15 MEMBER DENNING: Yes, later this morning.  
16 Absolutely, yes. Later this morning.

17 MEMBER APOSTOLAKIS: That's what happens  
18 when you have three hours.

19 MEMBER DENNING: Right, yes. Thanks. Can  
20 you run any of those tests by eleven?

21 MR. WOLFGANG: My name is Bob Wolfgang.  
22 I'm a fire protection engineer in NRR. And I'm going  
23 to give you information on the draft generic letter  
24 Post-Fire Safe-Shutdown Circuit Analysis Spurious  
25 Actuations.

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1           A summary of the presentation, I'll go  
2 over the purpose of issuing the generic letter, the  
3 information we are requesting from licensees, the  
4 background on this issue since 1997, the basis for the  
5 generic letter, the issue that is clarified in the  
6 generic letter, public comments, and a summary at the  
7 end.

8           The purpose of issuing the generic letter  
9 is to clarify how the NEI/EPRI cable fire test program  
10 reaffirms long-held regulatory positions and provide  
11 part of a foundation for licensees who are planning to  
12 transition to NFPA 805.

13           Also, to respond to the Agency's need to  
14 provide clarification and closure of outstanding fire  
15 protection issues, respond to --

16           MEMBER APOSTOLAKIS: Excuse me. Are you  
17 going to come back to these? I mean this on slide 16,  
18 the foundation for licensees planning to transition,  
19 will you elaborate on these later? Or can you tell us  
20 a few words now?

21           MR. WOLFGANG: Well, that's --

22           MEMBER APOSTOLAKIS: Why is that relative  
23 to NFPA 805?

24           MR. WOLFGANG: This is just to show that  
25 multiple spurious actuations should be included in

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1 their risk analysis model.

2 MEMBER DENNING: Well, since George has  
3 raised the question, let me ask it now. And that is  
4 NFPA 805 is one of the ways -- transitioning to NFPA  
5 805 is one of the ways that a licensee can respond to  
6 this. Now my question is how long does it take to  
7 transition to NFPA 805?

8 And I don't quite understanding within the  
9 time periods of the 90 days and six months and this  
10 kind of stuff, within the context of a transition to  
11 NFPA 805, when did that transition actually have to  
12 occur for the licensee to be able to use that pathway?

13 MR. WOLFGANG: All they have to do is  
14 respond to us within I believe it is the 90 days.  
15 That they are transiting to NFPA 805. And they will  
16 take care of this situation during that process.

17 MEMBER DENNING: Then how long would they  
18 have to transition to NFPA 805?

19 MR. WOLFGANG: They have -- what is it?  
20 Is it three years?

21 PARTICIPANT: Three years.

22 MEMBER DENNING: Three years?

23 MEMBER APOSTOLAKIS: Yes, it is a long  
24 time.

25 MR. KLEIN: Let me describe briefly. This

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1 is Alex Klein. Let me briefly describe the process a  
2 licensee would use if he wants to transition to NFPA  
3 805. And that is once the licensee had made the  
4 determination that he does want to transition to 805  
5 because that is an option for him, if he submits a  
6 letter of intent to the agency indicating that that is  
7 what he wishes to do.

8 At that point, we review that letter and  
9 make a determination as to whether or not the schedule  
10 that the licensee has laid out is acceptable to the  
11 Agency. And what we have right now in place is a  
12 three-year time frame for licensees to transition with  
13 the option of extending that time frame if the  
14 licensee can provide us with sufficient justifications  
15 beyond the three-year time period.

16 Now within that three-year time period, a  
17 licensee would submit their letter of intend, do the  
18 act of transition into NFPA 805. And then before that  
19 three-year time period is over, we would submit their  
20 license amendment to the staff for our review and  
21 approval prior to them actually receiving the  
22 amendment.

23 MEMBER APOSTOLAKIS: It seems to me that  
24 the -- actually is the first bullet in the previous  
25 slide that is important because the licensee that

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1 wants to transition to NFPA 805 has to convince you,  
2 I think, that they complied with all the regulations,  
3 right? There may be a few exceptions, as I remember  
4 for a period of time, and all that.

5 So the primary reason seems to be to  
6 reaffirm long-held regulatory positions because  
7 somebody who wants to transition has to demonstrate  
8 that they complied with all that.

9 MR. KLEIN: That is correct. Really I  
10 think the primary purpose of the generic letter is  
11 that first bullet on that slide 16.

12 MEMBER APOSTOLAKIS: Right, right.

13 MR. KLEIN: Yes. As an added benefit, it  
14 does provide the foundation for licensees who want to  
15 transition to 805.

16 MEMBER DENNING: Now wait a second. I  
17 definitely did not understand this. I mean clearly  
18 there are a lot of licensees out there that did not --  
19 cannot respond to multiple spurious actuations. And  
20 they are not going to have to bring their plant into  
21 compliance with having to meet all the multiple  
22 spurious actuations before going to NFPA 805 because  
23 then NFPA 805 doesn't help them at all, right?

24 MR. FRUMKIN: Yes, that is correct. And  
25 what Dr. Apostolakis was saying is correct is that we

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1 have an enforcement discretion in place so those  
2 licensees who discover during transitions that they  
3 are not in compliance can do a risk analysis of that  
4 and determine that it is not red, that it is not  
5 wilful, that it is not a severity one violation.

6 And, therefore, they can comp it -- put  
7 compensatory actions in place and move forward towards  
8 transition without necessarily correcting that in  
9 accordance with the old fire protection program.

10 MEMBER DENNING: But one thing that I  
11 think is an issue though and that is suppose there is  
12 a plant out there that would really like to do the  
13 NFPA 805 approach but within the 90-day period, don't  
14 they have to go through the entire analysis and  
15 identify the SSCs that are potentially vulnerable  
16 based upon this detailed multiple spurious actuation  
17 evaluation which seems to me like an extremely  
18 difficult problem to undertake.

19 Is that true that they have to really  
20 analyze the whole system within 90 days according to  
21 this multiple spurious actuations and identify  
22 vulnerable SSCs? Am I correct or not correct?

23 MR. WOLFGANG: Well, they have to -- well,  
24 I'll get to that on a slide here.

25 MEMBER DENNING: Okay, if you will get to

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1 it, you can go ahead.

2 MEMBER MAYNARD: I would like to challenge  
3 that first statement just a little bit though. And I  
4 know that it has been a long-held position by members  
5 of the staff but as far as, you know, NRC position,  
6 there are a number of licenses that were issued and  
7 plants inspected and with their programs were approved  
8 and licensed without making this assumption.

9 And I'm not convinced that it has clearly  
10 been a recognized regulatory requirement. And again,  
11 I know licenses were issued, programs were reviewed  
12 without making -- otherwise, we wouldn't even be here  
13 today if those licenses weren't issued at that time.  
14 So I would challenge that. The first statement.

15 MR. WOLFGANG: We know SERs have been  
16 issued for Byron and Braidwood with a single spurious  
17 actuation per fire event. And we've come to the  
18 conclusion basically that was issued as a mistake.  
19 That was a mistake.

20 MEMBER MAYNARD: But I know that there are  
21 a lot of plants out there a license. Their analysis  
22 were reviewed, their programs were reviewed. I know  
23 I was personally involved with them back in the '80s  
24 when some of these issues were starting to come to a  
25 highlight. And I know that there are a number of

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1 plants out there with licenses that although it may  
2 not be documented as clearly, that it was known that  
3 multiple spurious actuations were not taken in account  
4 in that analysis.

5 I don't think it is clear that this is  
6 just confirming compliance to requirements that were  
7 in place. I think it is a different set of  
8 assumptions.

9 MR. FRUMKIN: Yes, and this may, I agree  
10 that your assumptions apply to probably a number of  
11 plants out there. But for the most part, Appendix R,  
12 10 CFR 50, Appendix R, Section 3(g)(ii) and 3(g)(ii)  
13 which is the alternate and dedicated shutdown are what  
14 is in question.

15 The NRC went in and did an analysis of the  
16 3(g)(iii) alternate shutdown. And for a lot of  
17 3(g)(iii) which is, for lack of a better description,  
18 a control room abandonment, they allowed the  
19 assumption of one spurious actuation. 3(g)(ii) wasn't  
20 across the board inspected in the 80s. It was assumed  
21 that licensees could wrap or protect or would have  
22 adequate separation.

23 And it wasn't evaluated for multiple  
24 spurious because generally the staff didn't believe  
25 that -- well, I'm not sure why they didn't do it. But

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1 the big question was this alternate shutdown.

2 And in the 90s, we had the thermal lag.

3 And a lot of that wrap was taken out. And a lot of  
4 manual actions or assumptions were put into place.

5 And I don't mean to say that there was -- well, the  
6 point that I am trying to make is that there was  
7 another change. There was the removal of a lot of  
8 these thermal lag which was relied on to protect  
9 cables and probably would have mitigated many spurious  
10 actuations, many multiple spurious.

11 MEMBER MAYNARD: And I'm not saying at  
12 this point that they shouldn't be considered now. I'm  
13 challenging the regulatory positions that says all  
14 along everybody should have always done this. I think  
15 that, you know, we're now setting, you know, these are  
16 the things that definitely need to be considered.

17 If those were considered 20, 30 years ago,  
18 if that was part of the regulatory position for the  
19 licenses, we wouldn't have gone through a 20-year  
20 period here of trying to figure out what it really  
21 requires the licensee to do. Again, it's a regulatory  
22 -- I believe that this is something that falls within  
23 the backfit.

24 It needs a better analysis overall. And  
25 that doesn't mean that it is a bad thing to do. I'm

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1 just saying that I do not believe that we can take the  
2 position that this is a requirement that has already  
3 been there, that everybody should have already done.  
4 And that is kind of what we are saying in this generic  
5 letter.

6 MR. KLEIN: This is Alex Klein of NRR. I  
7 just wanted to add to the discussion here that -- and  
8 Bob can clarify this also for me -- is that the  
9 generic letter did receive CRGR approval. We did go  
10 to that Committee.

11 There are subsequent slides in Bob's  
12 presentation, I think 23, 24, 25, that does talk  
13 about the background, the regulatory background that  
14 you are speaking of that might clarify some of these  
15 discussion questions.

16 MEMBER MAYNARD: I'd be glad to look at  
17 that.

18 MR. WOLFGANG: Well, and also attend CFR  
19 Part 50, Appendix R, it also talks about you have to  
20 consider hot shorts. It doesn't set a limit on the  
21 number.

22 MEMBER MAYNARD: Well, I understand that.  
23 But there is a number of the regulations that come to  
24 an agreement between the licensee and staff as to what  
25 are -- what do you have to assume in a number of those

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1 things.

2 So anyway, we will get into it maybe aq  
3 little more with the regulatory evaluation. But I do  
4 not agree that --

5 CHAIRMAN WALLIS: Well, could we clarify  
6 this first bullet? I mean it seems to me that if we  
7 did have this long-held regulatory position, which was  
8 being enforced, then you wouldn't need this generic  
9 letter.

10 MEMBER MAYNARD: Right.

11 CHAIRMAN WALLIS: So something has changed  
12 as the result of these tests. So maybe there was a  
13 position which wasn't very well enforced or something  
14 or was not properly interpreted by the industry. Is  
15 that the problem?

16 MEMBER MAYNARD: Or the staff?

17 CHAIRMAN WALLIS: Well, the staff, yes.

18 MR. FRUMKIN: Well, I think we -- well,  
19 Bob, I think I would say that something did change.  
20 And that thing may not have been entirely the tests.  
21 I think that the staff had high confidence that these  
22 fire barriers that were installed were separating  
23 these redundant trains.

24 And they were removed and they were  
25 replaced with non-barrier solutions which were

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1 analysis, manual actions, and those type of things.  
2 And as soon as the NRC started inspecting post-thermal  
3 lag fixes, which was in 1997, well before these tests.

4 We had numerous -- there was an information notice  
5 97-something which presented numerous hot short and  
6 multiple -- well, numerous alternate associated  
7 circuits and circuit failure type issues.

8 So to hang this entirely on the test is  
9 not -- certainly the staff position goes before -- to  
10 before the tests. And that has been documented in  
11 that generic -- that information notice and there was  
12 a letter sent to NEI which expressed this sentiment  
13 well before -- I believe that was before the test as  
14 well.

15 CHAIRMAN WALLIS: The purpose of the  
16 generic letter is to reinforcement your enforcement  
17 which you were a bit lax about before or something?  
18 Is that what its purpose is?

19 MR. WOLFGANG: There was a lot of  
20 confusion. You were talking about 3(g)(iii) about  
21 alternative and dedicated shutdown systems and the use  
22 of one only -- you had to consider one spurious  
23 actuation there --

24 MR. FRUMKIN: Right, 3(g)(iii) and the  
25 Generic Letter 86-10 talked about spurious actuations

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1 quite a bit but the staff position is that those  
2 didn't apply to 3(g)(ii) and they were erroneously  
3 applied to 3(g)(ii), which is all we're really talking  
4 about right now. We are not talking about these 3(g)  
5 (iii) inspections that occurred in the 80s. We're not  
6 talking about the 3(g)(iii) approvals.

7 Every 3(g)(iii) program should have been  
8 approved with an SER. That was the policy. But we  
9 did not go into the 3(g)(ii) areas because the  
10 barriers and those solutions should have been  
11 sufficient.

12 MEMBER MAYNARD: It just seems to me that  
13 with all the confusion that has gone on for a number  
14 of years on this, a much cleaner way of doing this is  
15 if the NRC believes that this is something that needs  
16 to be done is just to come out with it as a  
17 requirement following the process for rulemaking, for  
18 changes, or whatever rather than trying to handle it  
19 through a generic letter requesting information to  
20 show compliance with a very confusing set of  
21 requirements.

22 MEMBER-AT-LARGE SIEBER: I suspect,  
23 though, that the staff does not believe that  
24 rulemaking is required, that the proper regulations  
25 already exist.

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1 MR. FRUMKIN: That is correct.

2 MEMBER-AT-LARGE SIEBER: In the review  
3 process that the staff has used in the past does not  
4 establish new regulations. The regulations are the  
5 regulations. And how the staff reviews something is  
6 another matter.

7 MEMBER MAYNARD: Well, how they review it  
8 but what it is accepted as to your certain assumptions  
9 and things --

10 MEMBER DENNING: I'm sure we are going to  
11 come back to this issue. So why don't you go ahead --

12 MEMBER-AT-LARGE SIEBER: It won't go away.

13 MR. WOLFGANG: Okay, moving to the next  
14 slide, more purposes of issuing a generic letter,  
15 respond to the Agency's need to provide clarification  
16 and closure of outstanding fire protection issues,  
17 respond to the licensee's request to provide  
18 clarification of regulatory expectations, and respond  
19 to the region's request to provide clarification of  
20 regulatory expectations for circuit inspections. And  
21 circuit inspections were resumed January 2005.

22 Generic letter, what information it is  
23 requesting from the licensees. Within 90 days to  
24 evaluate their licensing basis and information in the  
25 generic letter regarding multiple spurious actuations

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1 in the Post-Fire Safe-Shutdown Circuit Analysis.

2 MEMBER MAYNARD: Is that practical to  
3 expect -- I think we might get into a little bit more  
4 as to what we are really asking here but within 90  
5 days, for the whole industry to do this, I'm sure  
6 there is going to be some resources -- external  
7 resources needed in some cases.

8 With the whole industry trying to use  
9 those, is 90 days really a practical time frame to get  
10 what is really being asked for here?

11 CHAIRMAN WALLIS: Well, we believe that it  
12 is. But, you know, I guess when NEI talks, they have  
13 a consensus from the industry that it is not a  
14 sufficient time, We can always adjust that.

15 MR. WOLFGANG: Yes, I think what is being  
16 asked here is not for the technical evaluation of the  
17 entire circuit analysis. What we are asking for is  
18 for licensees to report whether they have a multiple  
19 spurious licensing basis or they have a single  
20 spurious licensing basis.

21 For those plants that have a multiple  
22 spurious and haven't analyzed for multiple spurious,  
23 then that is going to be a long-term fix. All we are  
24 asking them to do is to report their situation within  
25 90 days, which is a licensing --

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1                   MEMBER DENNING: Wait a second. How do  
2 they submit their functionality assessment of effected  
3 SSCs without doing that total analysis? Am I missing  
4 something here? And this is within 90 days, if  
5 you're not in compliance, you have to submit this  
6 functionality assessment of effected SSCs.

7                   MEMBER APOSTOLAKIS: And compensatory  
8 measures.

9                   MEMBER DENNING: And compensatory  
10 measures. I think that is the whole analysis, isn't  
11 it? I mean you don't necessarily know how you are  
12 going to ultimately correct them but it seems to me  
13 that the analysis has to be done in 90 days.

14                   Incidentally, I should have mentioned that  
15 listening in is EPM, which is a company that does this  
16 kind of stuff. But I should have mentioned that  
17 earlier that we do have an open line here.

18                   I'm sorry, go ahead.

19                   MR. WOLFGANG: Yes, what we are asking --  
20 yes, to submit the functionality assessment of  
21 effected SSCs.

22                   MEMBER DENNING: Yes. How do you  
23 determine what SSCs are effected unless you have  
24 looked at the multiple spurious actuations.

25                   MR. WOLFGANG: Yes, they have to look at

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1 the multiple spurious actuations.

2 MR. FRUMKIN: First, I agree with the  
3 member that doing a full analysis for 104 plants in 90  
4 days is not going to be credible. This is a major  
5 effort to look at that.

6 I believe though that the second bullet of  
7 compensatory measures for these areas where the plants  
8 are capable of putting compensatory measures and then  
9 solving the problems in a long-term program. That is  
10 credible. That is possible.

11 MEMBER APOSTOLAKIS: It seems to me that  
12 the 90 days applies to the first bullet but not the  
13 sub bullets.

14 MEMBER MAYNARD: I think it does a -- it  
15 certainly applies to the first bullet.

16 MEMBER DENNING: But the sub bullets are  
17 there in the generic letter.

18 CHAIRMAN WALLIS: Well, why is there an  
19 assumption that they are not in compliance now? I  
20 mean that they have done various things today to meet  
21 the regulations already. And their position would  
22 probably be we are in compliance now. So what are you  
23 asking us to do?

24 MEMBER DENNING: No, I don't think so.

25 MEMBER-AT-LARGE SIEBER: Well, if you took

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1 the lag out of your plant --

2 CHAIRMAN WALLIS: That's the problem.

3 They have changed something.

4 MEMBER-AT-LARGE SIEBER: You changed the  
5 configuration.

6 CHAIRMAN WALLIS: That is okay. So they  
7 have changed something. Thank you.

8 MEMBER DENNING: It is not just that,  
9 Graham. They have argued that this has not been the  
10 requirement. That you didn't have to do multiple  
11 spurious actuations. They did one at a time or a  
12 single. So they would argue this is not the  
13 regulatory -- they would argue that it is new  
14 requirement but kind of like Otto has.

15 MEMBER KRESS: But the regulation says  
16 broadly that under these conditions, you have to have  
17 one train of safe shutdown. And that can only be  
18 interpreted as multiple spurious actuation I think.

19 MEMBER MAYNARD: I don't think -- I don't  
20 agree with that. Through the regulatory process, you  
21 don't necessarily have to assume everything that  
22 anybody could ever conceivably come up with. And so  
23 that's why the NRC and the industry -- but you decide  
24 on a set of assumptions. And what you really have to  
25 assume to reasonably meet that requirement.

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1           And then as new information comes along,  
2           if those previous assumptions weren't conservative  
3           enough, you may need to do that. But that really  
4           constitutes a change there. Otherwise why would you  
5           have any guidance documents or any -- what is allowed  
6           to assume or whatever. So I would argue that it is  
7           part of it.

8           MEMBER DENNING: In some respect, this is  
9           an open-ended problem in terms of, you know, and so it  
10          begs for some kind of guidance as to where you end the  
11          search for things that can go wrong.

12          Continue.

13          MR. WOLFGANG: We are asking that within  
14          six months to submit the plan to return all effected  
15          SSCs to compliance with the regulatory requirements.  
16          And that is the plant modifications, license .  
17          Exemption request.

18          And we are also asking that within 30  
19          days, if you cannot meet the 90-day, six month  
20          schedule that we are requesting, you provide us  
21          notification you cannot meet it and your suggested  
22          schedule and completion date.

23          CHAIRMAN WALLIS: What kind of things  
24          would they do to come into compliance? Are they going  
25          to change these offending cables? Are they going to

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1 change the way in which they put out fires? Are they  
2 going to change the actual equipment in the SSC? It  
3 is very open ended what they are expected to do.

4 MR. WOLFGANG: Yes, they can protect  
5 cables. They can reroute cables. They can submit  
6 license amendments based on a risk analysis method --  
7 those type of things.

8 CHAIRMAN WALLIS: Manual actions?

9 MR. WOLFGANG: Well, not in 3(g)(ii)  
10 space. There are a lot of ways.

11 MEMBER DENNING: I don't know how  
12 expensive those ways are. I mean we say there are  
13 lots of ways but those ways may be extremely  
14 expensive.

15 CHAIRMAN WALLIS: Well, I'm also unclear  
16 about what it is they are supposed to assume can go  
17 wrong? When I read these things about they are  
18 supposed to assume the possibility that this can  
19 happen, it goes back to Otto's question here.

20 I mean if you assume the very worst that  
21 could possibly happen, then you could have enormous  
22 changes in the plants in order to avoid this worst  
23 conceivable thing. Is that what you are asking them  
24 to do?

25 MR. WOLFGANG: You have to assume all

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1 multiple spurious actuations.

2 CHAIRMAN WALLIS: Well, but that is a  
3 major thing, isn't it?

4 MEMBER MAYNARD: That is major.

5 CHAIRMAN WALLIS: You have to assume that  
6 it happens with the probability of one?

7 MR. WOLFGANG: Yes.

8 MEMBER-AT-LARGE SIEBER: Yes. On the  
9 other hand --

10 MR. WOLFGANG: 3(g)(ii) in deterministic  
11 space doesn't limit the number of --

12 MEMBER-AT-LARGE SIEBER: On the other  
13 hand, you restrict the fire to a single fire area,  
14 which means that if you have appropriate separation or  
15 fire barriers that you have a train that is free of  
16 fire, that will operate.

17 MR. WOLFGANG: Right.

18 MEMBER-AT-LARGE SIEBER: And that is the  
19 principle. I think it is going to vary dramatically  
20 from plant to plant, especially based on the age of  
21 the plant and the type of plant. I think some are  
22 going to be tremendously impacted. Some others may  
23 not. And again, depending on what assumptions you  
24 really have to make and what credit you can take for  
25 things you already have in place, things that have

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1 already been done, everything from operator actions to  
2 fire loadings, improvement in fire control,  
3 everything.

4 MEMBER DENNING: And, Jack, you talked  
5 about the separating of trains. And that's, you know,  
6 pretty straight forward. But isn't the real open  
7 endedness related to the spurious actuations where  
8 there is some unanticipated valve opens that effective  
9 give you a loss of coolant accident or something like  
10 that, that, you know, introduces a different element  
11 to safe shutdown. Isn't that the open-endedness that  
12 makes it so difficult.

13 And I also don't know whether -- how many  
14 plants really know what cables are in what trays  
15 within a room.

16 Obviously if you are going to do -- yes so  
17 that you basically are assuming anything within the  
18 room -- I mean you know that -- you have concluded  
19 that it has gone through a room up to this point.  
20 But, you know, they could be in totally different  
21 trays in the room. But you don't know where they are  
22 in the room.

23 CHAIRMAN WALLIS: Well, you have to assume  
24 that they are all together and they are all --

25 MEMBER DENNING: Assume that you have to

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1 submit it. But I don't know the answer to that.

2 MEMBER KRESS: Assume that you have to do  
3 it. But I don't know the answer to that.

4 MR. WOLFGANG: Well in a fire area in a  
5 room, if you assume a fire, you have to assume  
6 everything is --

7 MEMBER KRESS: Yes, but can everything  
8 have an inter --

9 CHAIRMAN WALLIS: Everything in that room  
10 can short together?

11 MEMBER KRESS: -- can it short together as  
12 an inter-cable connection even though it may be way  
13 separated?

14 MR. FRUMKIN: No, if it couldn't occur,  
15 then it wouldn't be -- I mean you wouldn't have -- we  
16 wouldn't be expecting energized cables to penetrate  
17 conduits. We wouldn't expect energized cables to jump  
18 from tray to tray.

19 Or, for example, DC current has to have  
20 the same path. If it is not in the same tray or same  
21 conduit you couldn't actuate that from an AC circuit  
22 or something of that nature.

23 MEMBER DENNING: I don't know whether --  
24 what utilities know what cables --

25 MR. FRUMKIN: Right, no, you are correct.

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1                   MEMBER DENNING: -- are in what trays you  
2 were going to run.

3                   MR. FRUMKIN: And that can be a very  
4 significant effort.

5                   One of the aspects is that for the  
6 3(g)(ii) area -- or for the 3(g)(iii) plants, some of  
7 the older plants are 3(g)(iii). And they don't have  
8 very much separation at all. But they have done a  
9 significant analysis that was reviewed in the 80s  
10 which we referred to earlier. And they do have the --  
11 because they have done that detailed analysis, they  
12 have the flexibility to do manual actions.

13                   So in effect, the newer plants with the  
14 good separation should be fairly well off. The older  
15 plants that had very little separation probably have  
16 done a lot of this analysis already and may already be  
17 in compliance.

18                   It is the middle plants that are more  
19 likely than the older plants to have the circuits  
20 traced. But they are kind of in the middle there.  
21 And they are the ones who I think are going to be  
22 having a more difficult time answering this generic  
23 letter.

24                   MEMBER-AT-LARGE SIEBER: That is a pretty  
25 limited number of plants then. This issue is, you

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1 know, I was a young man when this issue came out. The  
2 work has been done. And the plants that were built in  
3 the 80s, to my knowledge they all had pull tickets  
4 associated with cables when they were originally  
5 routed.

6 So you just run your computer and it tells  
7 you whether you've got separation or not. And if you  
8 don't, what circuits are offending circuits.

9 MR. FRUMKIN: Many plants have that. Or  
10 some plants have that.

11 MEMBER-AT-LARGE SIEBER: Some plants have  
12 it. Some plants had to do that all manually, hand  
13 over hand.

14 MR. FRUMKIN: But I just want to add one  
15 thing that the staff has come our with a statement --  
16 or, well, not really a statement but what 3(g)(ii)  
17 says is that when cables of the redundant trays are  
18 within the same fire area and are not protected, so if  
19 you have a area with train A equipment in it and no  
20 train B equipment or the train B is protected in  
21 accordance with 3(g)(iii) protection criteria, we're  
22 not -- so with the train B protected, we're not  
23 limiting the actions that -- the feasible and reliable  
24 actions for failures on train A.

25 So if you have a protected train outside

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1 of a fire area or protected with 3(g)(ii), the  
2 licensees can do feasible and reliable manual actions  
3 on the fire-effected train to let's say close that  
4 valve that opens spuriously or stop that pump that  
5 opens spuriously because there is a full -- typically  
6 from the control room, so there is good annunciation  
7 and indication, there is a full protected train  
8 outside of that fire-effected area.

9 And I'll just point to Alex and see if he  
10 nods at me. Okay, yes.

11 MEMBER-AT-LARGE SIEBER: And there is very  
12 limited amounts of equipment if you had a spurious  
13 actuation, would cause another accident like a LOCA.  
14 Some value opens in the valve is -- like a safety  
15 injection valve, is designed to pump in not pump out.

16 Okay, so there are check valves and things  
17 like that that would prevent that. But there area  
18 few cases -- PRVs for example --

19 MR. FRUMKIN: Yes, PRVs is one I was  
20 thinking of if you --

21 MEMBER-AT-LARGE SIEBER: Yes , that could  
22 open and --

23 CHAIRMAN WALLIS: New plant designs have  
24 this screw valves. And the spurious actuation of them  
25 create a LOCA.

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1 MEMBER-AT-LARGE SIEBER: Yes, but they  
2 have them so you get to a safer condition, right?

3 CHAIRMAN WALLIS: One question I was going  
4 to --

5 MEMBER-AT-LARGE SIEBER: It is just  
6 expensive to do it.

7 MEMBER DENNING: Yes, is there any kind of  
8 assessment as to what fraction of spurious actuations  
9 actually are deleterious as far as effecting safe  
10 shutdown capability? I mean has anybody in a risk  
11 study done that kind of an assessment? Or do you have  
12 any feeling as to the fraction of spurious actuations  
13 that will get you into trouble?

14 MR. FRUMKIN: Well, you asked for that.  
15 We have this bounding analysis that we did and you  
16 actually -- well, you have to look at a lot to find  
17 the ones that are going to give you problems from a  
18 spurious actuation standpoint. But in our bounding  
19 analysis, it took five pairs of spurious actuations in  
20 order to get a significant risk.

21 And it is because these spurious system --  
22 these multiple spurious effect systems that, you know,  
23 are the redundant train. So it effects both -- the  
24 train, the productive train or the unprotected train,  
25 and the redundant train so you really lose all your

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1 protection with these scenarios. And it doesn't --  
2 you have to look at a lot to find the bad players.  
3 And there don't actually have to be a lot of bad  
4 players, at least based on our bounding analysis for  
5 it to be of fairly high risk significance.

6 MEMBER DENNING: Continue please.

7 MR. WOLFGANG: Background since 1997,  
8 multiple LERs brought lack of consensus concerning  
9 circuits to the staff's attention. And this led to a  
10 moratorium on inspection of circuit issues back in  
11 1997.

12 In 2001, NEI/EPRI cable fire test  
13 demonstrated that multiple spurious actuations can  
14 occur. And they can occur in rapid succession or  
15 simultaneously without sufficient time for mitigation  
16 in between.

17 Therefore if a licensee doesn't account  
18 for multiple spurious actuations, and its circuits  
19 analysis, the licensee may not be in compliance with  
20 10 CFR 50.48 and 10 CFR Part 50, Appendix A, General  
21 Design Criteria, and (3) which require that a licensee  
22 provide and maintain free from fire damage, one train  
23 of systems necessary to achieve and maintain the safe  
24 shutdown.

25 Staff has developed the risk-informed

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1 approach to inspections to focus on risk-significant  
2 configurations based on the cable fire test. And this  
3 is RIS 2004-003.

4 MEMBER DENNING: Now let me ask with  
5 regard to that, I understand that that was prepared  
6 for inspection as opposed to compliance.

7 MR. WOLFGANG: Correct.

8 MEMBER DENNING: But is there a real  
9 reason why one couldn't use guidance of that type for  
10 compliance as well? Do you see a regulatory  
11 constraint that would prevent you from -- I mean from  
12 the regulations that exist now, do you think it would  
13 be incompatible for the staff to provide the  
14 equivalent, perhaps a perturbation off of that or  
15 perhaps a revision to NEI's risk-informed guidance?  
16 Why can't we do that?

17 MR. WOLFGANG: I think the thing is we  
18 haven't seen licensee's risk tools, their model that  
19 we would have to approve prior to them using any risk  
20 analysis.

21 MR. KLEIN: Let me take a shot at  
22 answering the question maybe at a higher level. And  
23 that is with respect to licensees who are required to  
24 meet the requirements of Appendix R. Don't today have  
25 the ability to change that regulation or the

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1 commitment to that regulation based upon risk  
2 information.

3 If they want to do that, they would have  
4 to seek an exemption request from us against the  
5 regulation. They may certainly use risk information if  
6 they want to come in and see us with an exemption  
7 request, that is certainly open to them.

8 But what I think Bob is indicating is that  
9 a licensee may not make a change in their plant using  
10 risk information and making the conclusion based upon  
11 their standard license condition that says that, you  
12 know, it doesn't effect their ability to achieve and  
13 maintain safe shutdown.

14 The staff has been telling licensees that  
15 we would like them to come in and see us for such an  
16 exemption request or a license amendment.

17 MEMBER DENNING: Yes, I understand that  
18 that is the way -- that is the process by which they  
19 would use risk information to do that. But this first  
20 bullet is generic. It is generic information as to  
21 how many combinations of things or what are kinds of  
22 situations that are -- could be expected to be risk  
23 significant?

24 Now I realize it is not totally complete  
25 but it, you know, it gave guidance to the inspectors

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1 as to what are the combinations of things that could  
2 risk significant to look at and make sure. And I  
3 don't see any reason why one couldn't effectively rule  
4 out some of this total space of situations that the  
5 applicant has to look at to be compliant.

6 Now, you know, Tom is saying -- and I  
7 think it is kind of the regulatory position that  
8 you've got to look at everything because anything that  
9 can prevent this safe shutdown pathway is a potential  
10 problem. But you used it for the inspector to give  
11 him guidance on what is risk important and not in the  
12 area.

13 Couldn't you have done the same to provide  
14 generic guidance on this is how far you have to go in  
15 this process of looking at multiple spurious  
16 actuations.

17 MR. FRUMKIN: Bob, let me -- I'll be  
18 candid. We tried very hard to read 3(g)(ii) as a --  
19 to be risk informed in the way you describe. And with  
20 help from our lawyers, we were unable to get there for  
21 those pre-`79 plants. And then there is also the  
22 Agency or the Commission has approved a risk-informed  
23 rule.

24 And although it is more comprehensive,  
25 that is out there. And we considered the possibility

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1 of a risk-informed changed to this rule, to the  
2 current 3(g)(ii), and there is currently a rule that  
3 has been promulgated by the Commission. So that did  
4 not seem like a credible approach.

5 CHAIRMAN WALLIS: Well, could I follow up  
6 on that? And I looked at this risk informed approach.  
7 It seems to be just advice on vendors --

8 MR. FRUMKIN: Yes?

9 CHAIRMAN WALLIS: -- to focus on certain  
10 configurations. Well, that's okay. Focus on what  
11 matters. But then how does this inspector decide to  
12 reach some sort of a finding that something is not  
13 adequate? Or is not in compliance. That would get  
14 closer to tying these things together because the  
15 whole question here is what do they have to do in  
16 order to be in compliance.

17 MR. FRUMKIN: That is correct.

18 CHAIRMAN WALLIS: And how does the  
19 inspector know when they are in compliance or not?  
20 Well, he has just chose to focus on these things. How  
21 does he then decide when he is focused whether or not  
22 they are in compliance?

23 MR. FRUMKIN: And the answer to that is  
24 they pull up the licensing basis and if the licensing  
25 basis, if they do not have -- are not licensed for

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1 single spurious, that are considered to be -- required  
2 to look for multiple spurious.

3 CHAIRMAN WALLIS: Well then what are they  
4 supposed to do?

5 MR. FRUMKIN: Then that would be -- that  
6 could be -- that would be a finding would be run  
7 through the risk analysis of this STP. It would be  
8 cited. And the licensee would have to resolve a  
9 finding in the normal manner.

10 MEMBER DENNING: Incidentally, I think  
11 your last statement about their legal interpretation  
12 of pre-`79 is very important as far as our  
13 considerations are concerned because I mean it could  
14 be indeed that we are in a box in terms of whether you  
15 can risk inform the current regulation or whether you  
16 would need to change a rule which is obviously a huge  
17 undertaking.

18 CHAIRMAN WALLIS: Well, I'm really  
19 wondering, you made an initial statement that we  
20 should have had a subcommittee meeting. We seem to be  
21 at the level of behaving like a subcommittee so trying  
22 to determine whether or not you are ready to go to the  
23 full Committee because there seems to be so many  
24 questions here. And yet we are here as a full  
25 Committee.

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1                   MEMBER DENNING: That is why we have three  
2 whole hours.

3                   CHAIRMAN WALLIS: You know subcommittees  
4 sometimes have the option of saying you guys aren't  
5 ready. You shouldn't go to the full Committee. But  
6 they are here.

7                   MEMBER DENNING: The full Committee has  
8 that same option, doesn't it?

9                   MR. WOLFGANG: To continue, in 2004, staff  
10 held a public meeting in Atlanta to discuss the staff  
11 positions and solicit stakeholder feedback. We worked  
12 with NEI to finalize an acceptable industry guidance  
13 document for circuit analysis. And that was NEI 0001.

14                   Staff issued RIS 2005-30 to clarify  
15 regulatory requirements for a circuit analysis. And  
16 that RIS addressed the terms associated circuits, any  
17 and all, and emergency control stations.

18                   And this draft generic letter was issued  
19 for public comment in October 2005. We held a public  
20 meeting in March of this year. And the pertinent  
21 public comments were incorporated into the final draft  
22 of the generic letter. And we also received CRGR  
23 approval to issue the generic letter.

24                   The basis for the generic letter -- the  
25 bulleted review of NRC regulations, generic

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1 communications, correspondence related to this issue.  
2 And we have references identified in the generic  
3 letter. The results of the 2001 NEI EPRI cable fire  
4 test program, prior to the cable fire test, there was  
5 very little information available regarding circuit  
6 failure during a fire which made enforcement of the  
7 regulations in this area difficult. And also input  
8 from inspectors on issues that needed to be addressed.

9 The issue clarified in the generic letter  
10 is multiple spurious actuations. As Dan said earlier,  
11 some licensees claim that only a single spurious  
12 actuation had to be assumed in their circuit analysis.  
13 This was based on a misinterpretation of Generic  
14 Letter 86-10 in response to question 5.3.10.

15 And also some licensees claimed multiple  
16 spurious actuation occur with sufficient time in  
17 between them to take mitigating actions.

18 CHAIRMAN WALLIS: Now this  
19 misinterpretation has been going on for how long?  
20 D.L. 86 is 9/86?

21 MR. WOLFGANG: Yes.

22 CHAIRMAN WALLIS: Over 20 years they have  
23 been under some misapprehension about the regulations?

24 MR. WOLFGANG: That is my understanding.

25 MR. FRUMKIN: In this section of the

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1 generic letter, it refers to the 3(g)(iii) associated  
2 circuits I believe. So it took 3(g)(iii) alternate  
3 shutdown -- I'm sorry -- it took this 3(g)(iii)  
4 assumption and applied it to 3(g)(ii) areas. And that  
5 is what this misinterpretation is describing.

6 MEMBER APOSTOLAKIS: Let me understand it  
7 a little bit the second bullet here. Suppose there is  
8 sufficient time between actuations? Okay, so you have  
9 the first one. You really don't know what the second  
10 one is going to be, right? It could be anything.

11 MR. WOLFGANG: Second.

12 MEMBER APOSTOLAKIS: Oh, let's say there  
13 are two --

14 MR. WOLFGANG: Actuations?

15 MEMBER APOSTOLAKIS: -- spurious -- yes.

16 MR. WOLFGANG: Yes, based on these tests,  
17 they could occur --

18 MEMBER APOSTOLAKIS: No, I understand  
19 that, that it is a very short time.

20 MR. WOLFGANG: Right.

21 MEMBER APOSTOLAKIS: But let's assume for  
22 a moment that there is sufficient time, there is long  
23 time between them.

24 MEMBER DENNING: And there may be, George.  
25 There is a contention that --

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1 MEMBER APOSTOLAKIS: Okay.

2 MEMBER DENNING: Yes, right.

3 MEMBER APOSTOLAKIS: But you still don't  
4 know what the second one is going to be.

5 MEMBER DENNING: Is going to be, right.

6 MEMBER APOSTOLAKIS: So you can really  
7 take mitigations actions without know what the second  
8 will be?

9 MEMBER DENNING: Well, now wait a second.  
10 If you have mitigated the first one --

11 MEMBER APOSTOLAKIS: Yes.

12 MEMBER DENNING: -- then it is as if you  
13 now just have one.

14 MEMBER APOSTOLAKIS: Oh, so now you are  
15 going to get together and wait.

16 MR. WOLFGANG: And when the second one  
17 occurs and you have time to mitigate that one.

18 MEMBER APOSTOLAKIS: And this is doable?  
19 I mean has anybody looked into the details of this?  
20 It comes back to this issue of open endedness. You  
21 really don't know what is going to happen next. So I  
22 don't understand this particular -- I mean have they  
23 submitted details, you know, if you have sufficient  
24 time, you will protect the plant?

25 MEMBER DENNING: You know what I think

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1 would help us is we had some better feeling as to how  
2 do they really mitigate these actuations?

3 MEMBER APOSTOLAKIS: Yes, exactly,  
4 exactly.

5 MEMBER DENNING: What is a typical -- and  
6 I know there are constraints on manual --

7 MR. WOLFGANG: Yes, in 3(g)(ii), they  
8 can't use manual actions.

9 MR. KLEIN: Licensees have commonly used  
10 operator manual actions to mitigate that spurious  
11 actuation. They may send an operator out in a plant  
12 to close a valve or some such action like that. And  
13 then they wait for the next actuation and they say,  
14 okay, I've got plenty of time available to have taken  
15 that first action. And now they wait for the second  
16 action. And when that occurs, they send the operator  
17 out.

18 So I think that second bullet there is to  
19 just simply indicate to the Committee that that is the  
20 claim that some licensees have made. That is not  
21 necessarily a position that the staff agrees with.

22 MEMBER APOSTOLAKIS: No, I understand  
23 that.

24 MR. WOLFGANG: Yes.

25 MEMBER APOSTOLAKIS: But I'm trying to

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1 understand the position.

2 MEMBER DENNING: Now suppose you had --  
3 suppose it takes 30 minutes to have them get out there  
4 and close the valve, now obviously -- more than, you  
5 know, and then something else happens say before he  
6 closes that valve, then the real question is there a  
7 compounding effect?

8 MR. WOLFGANG: And I guess like --

9 MEMBER DENNING: As far as you don't have  
10 enough operators that you can send out to do all these  
11 --

12 MEMBER APOSTOLAKIS: The real question is  
13 is the length of time the critical variable here. And  
14 it doesn't seem to me to be.

15 MR. FRUMKIN: I mean we'll give you an  
16 example, for example if you have a -- you going to  
17 drain two valves in series that would drain the RWST  
18 and you also damage a number of other equipment. They  
19 fail. They short out and become unavailable.

20 Well, if you have -- if you lose the  
21 indication on the RWST and you open up the valve and  
22 you say you have plenty of time to -- you have  
23 indication the valve opened spuriously, you can go  
24 down and close the valve and then when the next valve  
25 opens, it has no effect.

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1 I think that would be an example of where  
2 they feel they would have sufficient time. Let's say  
3 the circuits are in cable trays -- you know, 20, you  
4 know, six cable trays above. There is going to be a  
5 good deal of time before the first cable tray is  
6 damaged and the next -- the first cable is damaged and  
7 then the next cable.

8 So -- and from a risk standpoint, you  
9 might be able to argue yes, we will have adequate  
10 indication that the valve opened and we have adequate  
11 time. And then that could be a risk-informed type  
12 analysis.

13 But if they are in the same cable, then  
14 they both could open simultaneously.

15 MEMBER MAYNARD: If there is time and  
16 there are a number of things they can do, when you  
17 have a fire in an area, you typically know what cables  
18 and what other things could be potentially effected in  
19 that and the manual actions going out either manually  
20 isolating valves, pulling breakers, a number of things  
21 you can do. But it is based on what is in that area  
22 or what could be effected with those in that area.

23 MEMBER APOSTOLAKIS: I remember when I was  
24 reading the analysis of the Browns Ferry fire a long  
25 time ago. They did have spurious actuations there did

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1 they not?

2 MR. WOLFGANG: Yes.

3 MEMBER APOSTOLAKIS: Within 20 minutes I  
4 believe they had all sorts of signals and so on. And  
5 then things started going dead. How does that  
6 experience fit into this?

7 MR. FRUMKIN: I think that experience is  
8 "the long-held staff position" that multiple  
9 simultaneous spurious actuations occur. I think when  
10 you want to point your finger to where we come up with  
11 that, it comes from 1975. It comes from the very  
12 beginning of fire protection regulation is that these  
13 spurious actuations occur.

14 And I think that -- unfortunately the  
15 statements of consideration for Appendix R are short.  
16 You know we have, you know, dozens of pages for a  
17 short NFPA-805 and there may be a dozen pages and a  
18 page maximum for 3(g)(iii) -- for 3(g) of Appendix R.  
19 So we really can't go back in time and pull out the  
20 basis for that. But we have Mark Sallies here, he  
21 might be able to shed some light on that.

22 But I believe that that is the long-held  
23 staff position is the Appendix R fire and these  
24 multiple spurious and rapid succession starting pumps  
25 giving incorrect indication, doing all sorts of

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1 unpleasant things to the plant.

2 CHAIRMAN WALLIS: The incorrect indication  
3 is a big problem. Something has happened and yet you  
4 don't know quite what has happened. That is another  
5 variable altogether from the time. I mean it is the  
6 uncertainty of knowing what is going on which might  
7 lead the operator to do the wrong thing.

8 MEMBER-AT-LARGE SIEBER: Yes, on the other  
9 hand, indications usually either go full scale or to  
10 zero.

11 MEMBER MAYNARD: A lot of times you've got  
12 multiple indications. And that is something they are  
13 trained on quite a bit is on instrument failures.  
14 That said, it is not uncommon to have an instrument  
15 failure without a fire. So they are trained on how to  
16 handle that.

17 MR. FRUMKIN: Right. One of the failure  
18 though they can also get -- and, again, there's  
19 multiple indications, but they could get an indication  
20 of a pump starting when it didn't start. Or a pump in  
21 a start and stop position and then that's going to  
22 take time for them to troubleshoot and whether it was  
23 started or stopped could it be adversely effecting  
24 overfilling the plant or not.

25 There are a number of timing issues that

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1 I'm sure they are trained on. But they can be  
2 potentially challenging.

3 MEMBER DENNING: Continue.

4 MR. WOLFGANG: The NRC letter from Sam  
5 Collins to NEI in 1997 stated that multiple spurious  
6 actuations caused by fire-induced hot shorts must be  
7 considered and evaluated. As I stated earlier, Byron  
8 and Braidwood have SCRs approving the assumption of a  
9 single spurious actuation for a fire event. So if the  
10 staff position is applied to them, it would be  
11 considered compliance backfit.

12 The generic letter --

13 MEMBER-AT-LARGE SIEBER: That's a unique  
14 case, those two plants.

15 MR. WOLFGANG: Yes, correct. The generic  
16 --

17 MEMBER APOSTOLAKIS: But what does that  
18 mean now?

19 MR. WOLFGANG: They are in compliance by  
20 definition.

21 MEMBER APOSTOLAKIS: You would say the SCR  
22 was not correct or what?

23 MR. WOLFGANG: They are in compliance by  
24 definition, right.

25 MEMBER APOSTOLAKIS: But I don't

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1 understand this compliance backfit.

2 CHAIRMAN WALLIS: Compliance by mistake is  
3 what I heard earlier.

4 MR. WOLFGANG: Well, by regulatory  
5 approval.

6 MEMBER APOSTOLAKIS: Can you explain the  
7 parenthesis? If stop position is applied to them, it  
8 would be a compliance backfit. You mean the current  
9 position?

10 MR. WOLFGANG: If they comply with their  
11 SER, the SER is approved even though it was a mistake,  
12 it would be a compliance backfit if we made them  
13 change.

14 MEMBER APOSTOLAKIS: So you would have to  
15 admit then that the SER was not correct?

16 MR. WOLFGANG: We have already admitted  
17 that.

18 MEMBER APOSTOLAKIS: Okay.

19 MEMBER MAYNARD: It is a matter of what  
20 regulatory process is used to actually do it. A lot  
21 fo people think backfit is a bad thing. I think it is  
22 a process that should be used a little bit more rather  
23 than trying to go around a lot of these things. Just  
24 say hey look, we've changed or this is a new  
25 requirement. Here's the regulatory burden. Here is

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1 the increased safety benefit. We are imposing this as  
2 the new requirement for you. It's not necessarily a  
3 bad thing. Just what regulatory burden --

4 MEMBER APOSTOLAKIS: But this doesn't  
5 happen too often, right? I mean --

6 MEMBER DENNING: What? Regulatory  
7 mistakes?

8 MEMBER APOSTOLAKIS: Yes.

9 MEMBER DENNING: Right.

10 CHAIRMAN WALLIS: Well, this last bullet,  
11 I have a lot of problem with. And they must be  
12 considered and evaluated. But it seemed to be very  
13 unclear about to what depth and by what methods these  
14 things must be considered and evaluated. That seems  
15 to be so open-ended that the licensee must be  
16 uncertain what he has to do.

17 MEMBER DENNING: RIS provides more detail  
18 than the generic letter does, right. The 2005 RIS.

19 MR. WOLFGANG: 2005-30?

20 MEMBER DENNING: Yes.

21 MR. WOLFGANG: Not on multiple spurious  
22 actuations, no.

23 MEMBER DENNING: No?

24 MR. WOLFGANG: It doesn't address that.

25 We didn't put that in there because we thought

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1 multiple spurious actuations because of this Byron and  
2 Braidwood SCR could be considered possibly a change in  
3 staff position. So that's why we didn't want to put  
4 it in a RIS.

5 CHAIRMAN WALLIS: There is no regulatory  
6 guide that says how to evaluate multiple spurious  
7 actuations?

8 MR. KLEIN: I think if I could respond to  
9 that question, I'll ask Dan also to pipe in. Is on  
10 page 7 of the generic letter where we do talk about,  
11 you know, ways that licensees can bring themselves  
12 into compliance, there is a discussion in there about  
13 the deterministic methodology or NEI-0001.

14 We do talk about the guidance in there in  
15 Chapter 3. We do say that for post-fire safe-shutdown  
16 circuits in conjunction with the guidance provided in  
17 this generic letter that NEI-0001 is one of the  
18 acceptable approaches to achieve regulatory compliance  
19 with the fire protection requirements for multiple  
20 spurious actuations.

21 So that's one example. And Dan can  
22 correct me if I've overstated this.

23 MR. WOLFGANG: And we say in conjunction  
24 with the guidance provided in this generic letter to  
25 mean consider multiple spurious actuation. I believe

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1 NEI-0001 says to consider two spurious actuations.

2 CHAIRMAN WALLIS: That doesn't mean  
3 anything to me. It could simply mean to say well I  
4 considered it and I think it is irrelevant or  
5 something. I mean what does consider mean? But what  
6 depth? By what methods?

7 MEMBER APOSTOLAKIS: To the depth required  
8 to convince the staff.

9 MEMBER BONACA: That is called open ended.  
10 We could fix it here but it seems to me that, you  
11 know, we do have a problem. And we are trying to  
12 figure out what is the best regulatory process to  
13 solve it. But the problem is there.

14 CHAIRMAN WALLIS: Well, I think we agree  
15 there is a problem. It is just whether or not there  
16 is a mature enough process in place to make something  
17 that is workable happen.

18 MEMBER BONACA: I understand.

19 MEMBER-AT-LARGE SIEBER: Well, this work  
20 has already been done once. The only thing that  
21 changed is the disqualification of certain fire  
22 barriers. All the licensees have done this. And it  
23 should be part of their licensing basis. There should  
24 be plant records as to how they did it the first time.

25 MEMBER DENNING: Really, Jack? I mean

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1 isn't there an issue here of the number of licensees  
2 who thought that they were really dealing with one  
3 spurious actuation requirement? Or one at a time?

4 MEMBER-AT-LARGE SIEBER: I can only speak  
5 to one licensee or about one licensee. And that was  
6 not the assumption.

7 MEMBER DENNING: That was not your  
8 assumption.

9 MEMBER-AT-LARGE SIEBER: No.

10 MEMBER DENNING: No. But there are  
11 licensees out there --

12 MEMBER-AT-LARGE SIEBER: Otto, was that  
13 yours? It is sort of obvious from Browns Ferry that  
14 you get more than one.

15 MEMBER MAYNARD: I'm trying to recall  
16 because the only place where we had different trains  
17 mixing was in the control room so it was primarily a  
18 control room-related issue.

19 MEMBER KRESS: But that is one purpose of  
20 the generic letter to find out the status.

21 MEMBER-AT-LARGE SIEBER: The only time the  
22 number of faults becomes an issue is when you are  
23 trying to solve the problem with operator manual  
24 actions. So now you've got too many things for too  
25 few people to do.

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1           But if you have train separation and the  
2 train separation is effective, you are going to get  
3 some spurious actuations which are going to be  
4 upsetting but not fatal. And you are still going to  
5 maintain a full set of safety equipment that  
6 functions. And that is the object of the fire  
7 protection regulation.

8           MR. KLEIN: I would strongly agree with  
9 what Dr. Sieber just indicated in that the focus here  
10 is on 3(g)(ii) compliance and that is where you've got  
11 the redundant trains in the same fire area as Dan had  
12 indicated. And Dan had indicated some of the history  
13 that, you know, led us up to this.

14           And that had to do with the resolution  
15 that some licensees used to address the thermal lag  
16 issue where they removed some of these fire barriers  
17 and in lieu of meeting the separation requirements of  
18 3(g)(ii), elected to put in place the use of operator  
19 manual actions.

20           And I think that is a very important thing  
21 to kind of keep in mind.

22           MEMBER-AT-LARGE SIEBER: But other  
23 licensees pulled no cable.

24           MR. KLEIN: That is correct. I'm not --

25           MEMBER-AT-LARGE SIEBER: They moved

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1 circuits out of the same fire area.

2 MR. KLEIN: Yes, I'm not suggesting that  
3 all licensees implemented unapproved operator manual  
4 actions in lieu of the requirements of 3(g)(ii).

5 There are other licensees who did plant modifications,  
6 did re-analysis, did re-wraps, pulled cables, what  
7 have you to bring themselves back into compliance with  
8 3(g)(ii).

9 MEMBER-AT-LARGE SIEBER: And some of them  
10 didn't use thermal lag to begin with.

11 MR. KLEIN: That is correct.

12 CHAIRMAN WALLIS: Well, I don't really  
13 have a good understanding of what kind of spurious  
14 actions we are talking about, what kind of operator  
15 actions in response we're talking about, and whether  
16 redundant trains solve the spurious action problem.

17 If I have a fire scenario and it switches  
18 on my high pressure injection, I've got a pump that  
19 runs and it is pouring water into the system, right?  
20 For one thing, I have to know -- I have to diagnose  
21 what is happening. Do I have to send somebody  
22 somewhere to shut a valve? And does that factor have  
23 some redundant train help me at all when something has  
24 been activated spuriously? I mean it is not clear to  
25 me what the range of kind of scenarios is that you are

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1 talking about here.

2 And whether redundant trains always help  
3 you or don't. Maybe they don't help you at all  
4 sometimes. And maybe the operator action sometimes is  
5 so severe that it is very difficult to take.

6 MEMBER MAYNARD: I think in most cases,  
7 there are things they can do. But there are some --  
8 and I think the power operator relief valve is one  
9 that if you have a system where you can't operate the  
10 block valve or the PRE, if it opens you basically have  
11 given yourself a small break.

12 CHAIRMAN WALLIS: That's what I think.  
13 When you think about TMR, they had a false indication  
14 because there was a light which said it was closed  
15 when it was open.

16 MEMBER MAYNARD: But most times you are  
17 still covered by -- I mean you are still analyzed for  
18 a small break LOCA or for the other events. A pump  
19 coming on, there are multiple ways to turn pumps off.  
20 And you are not going to be injecting water at such a  
21 rate that you have, you know -- I'm kind of talking  
22 more PWR than I am BWN here so I --

23 MEMBER DENNING: But it is those things  
24 though -- it is the multiplicity of those things that  
25 boggles my mind. You know rather than train

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1 separation and train protection which you talked  
2 about, it just seems like there is such a multiplicity  
3 of potential things and trying to analyze all those  
4 things seems almost open ended.

5 MEMBER-AT-LARGE SIEBER: There aren't --  
6 in sheer numbers, there aren't all that many safety  
7 circuits. And if you go underneath the control room  
8 into the faucet rafter, you'll find loads of jumpers  
9 and knife switches and things like that where you can  
10 de-energize control circuits.

11 Now one of the problems is that it  
12 actually, in a lot of circuit breakers, it takes power  
13 to trip it, you know. The trip coil requires  
14 energization so pulling a knife switch doesn't  
15 guarantee that it will run forever. And so the  
16 operator really has to understand how the control  
17 system is set up to be able to do that.

18 But there are ways to overcome these  
19 problems that don't require excursions all over the  
20 plant. And on the other hand, the plant is designed  
21 to be safe provided that you have a functional safety  
22 train. Separation criteria, if rigidly applied,  
23 provides that independent safety train.

24 MEMBER DENNING: We are going to now take  
25 our break until 20 after 10. And then we will have to

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1 move surprisingly quickly after that.

2 CHAIRMAN WALLIS: Okay. So we're going to  
3 take a break until 20 past 10.

4 (Whereupon, the foregoing matter went off  
5 the record at 10:09 a.m. and went back on the record  
6 at 10:23 a.m.)

7 CHAIRMAN WALLIS: Rich, would you resume  
8 the management of the meeting, please?

9 MEMBER DENNING: Please proceed.

10 MR. WOLFGANG: Okay. The last issue,  
11 clarifying the generic letter, the point we have here  
12 is the staff position on multiple spurious actuations  
13 presented in the generic letter is consistent with  
14 section 9.5.1 of the standard review plan.

15 Public comments. The significant public  
16 comment was that the generic letter constituted a  
17 backfit to licensees. And we addressed this comment.  
18 We obtained CRGR approval to issue this generic  
19 letter. And, as I said earlier, only for Byron and  
20 Braidwood, who have approved SERs that we know of,  
21 would this constitute a backfit.

22 Basically, this generic letter is just a  
23 request for information.

24 MEMBER MAYNARD: I would challenge that.

25 MR. WOLFGANG: Yes. I think --

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1                   MEMBER MAYNARD: That's all right. We'll  
2 comment on that.

3                   CHAIRMAN WALLIS: It isn't just a request  
4 for information. It asks them to do a lot of things.

5                   MEMBER MAYNARD: Yes. That is what I  
6 challenge, that statement. Yes. We've talked about  
7 it.

8                   CHAIRMAN WALLIS: That was what I was  
9 uncertain about.

10                  MEMBER DENNING: Why don't you go ahead  
11 and summarize, even though we're going to have a  
12 couple of other things? Why don't you go ahead and  
13 summarize? Then there are a couple of other things we  
14 would like you to -- we have more than started. We're  
15 almost done.

16                  MR. WOLFGANG: A summary. The generic  
17 letter, as I said before, is a request for information  
18 from licensees. The industry cable fire test program  
19 reaffirmed the staff interpretation of the regulatory  
20 requirements concerning multiple spurious actuations  
21 must be considered in the circuits analysis. The  
22 generic letter is necessary to ensure that all  
23 risk-significant circuit situations are identified and  
24 addressed.

25                  CHAIRMAN WALLIS: Could you go back a bit

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1 and say something about why this came about? I mean,  
2 wasn't this something to do with this thermal lag  
3 business? All of these installations, like Hemmicks  
4 and Eastern, every time we look at them --

5 MR. WOLFGANG: Yes.

6 CHAIRMAN WALLIS: Well, isn't that the  
7 solution would be to have a proper barrier around  
8 these things?

9 MR. WOLFGANG: That's one solution, yes.

10 MEMBER DENNING: I don't see that as a  
11 total solution. I don't --

12 MR. WOLFGANG: That is one solution.  
13 Another solution is a separation, 20-foot separation.

14 CHAIRMAN WALLIS: But in the past, when we  
15 believed that this thermal lag worked, there wasn't a  
16 problem. Is that right?

17 MEMBER MAYNARD: No. I think the problem  
18 was still there then. This has been bounced around  
19 since I know at least the early '80s as an issue. I  
20 think the thermal lag, it helped in some cases where  
21 you could show separation in the trains, but it  
22 doesn't necessarily take care of you if you've got  
23 cables in the same area that are --

24 MEMBER DENNING: Right. They can still  
25 give you spurious actuation, regardless.

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1 MEMBER MAYNARD: Right.

2 MEMBER DENNING: Now, it may be -- do you  
3 have any comments on that?

4 MR. FRUMKIN: Yes. If you have the  
5 separation, you can still get spurious actuations.  
6 And that's a box that we're not in with the rule. The  
7 rule does not require that those be protected. So all  
8 plants have the flexibility for the unprotected train  
9 to mitigate through feasible and reliable manual  
10 actions those types of spurious actuations.

11 Now, if you were to get a spurious  
12 actuation that were to give you all incorrect  
13 indication and was not recoverable, then that would  
14 still have to be resolved because it would be a  
15 potential safety issue. But for the minor ones that  
16 we have been talking about that would be fairly easy  
17 to resolve through a manual operator action or there  
18 are procedural controls or something of that nature,  
19 that would not be a compliance issue per se.

20 MEMBER DENNING: Help me with that because  
21 I still don't quite understand it. So if you have a  
22 protected train and you get a spurious actuation from  
23 an unprotected train, then you have to analyze all  
24 combinations of spurious actuations still, don't you,  
25 that are possible in that unprotected train?

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1 MR. FRUMKIN: Alex, do you want to?

2 MR. KLEIN: Yes, I believe you do because  
3 the over-arching requirement of appendix R is to be  
4 able to safely bring your plant to safe shutdown. And  
5 if you don't know what's occurring in your plant, then  
6 you can't meet that over-arching high-level goal of  
7 achieving and maintaining safe shutdown of your plant.

8 MR. FRUMKIN: And I will just say that  
9 once you have your protective train, your protected  
10 train, your unprotected train has a very limited set  
11 of things that could hurt you.

12 Now, we're talking we have plenty of  
13 water. We have plenty of indication. We have plenty  
14 of everything. But now we might open, we might cause  
15 a drain letdown path to open or we might cause a pump  
16 to start, but we should be getting clear indication of  
17 that in the control room. And in the normal  
18 procedure, process, you'll be getting indication of  
19 these things happening. And they should be able to  
20 mitigate them fairly effectively.

21 Now, there may be some things that would  
22 be difficult to mitigate. And, as Alex says, they  
23 have to find those and find a way to mitigate them.

24 MEMBER DENNING: So you have lots of  
25 things you have to analyze, but the mitigation of it

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1 is probably not too severe for the plant, and the  
2 plant is allowed to do manual action on it.

3 Now, there is another set here. So what  
4 is the other set? Aren't you always required to have  
5 a protected train?

6 MR. FRUMKIN: Yes. And these plants don't  
7 have that protected train. In effect, all circuit and  
8 manual action findings or potential violations are  
9 lack of protection, lack of circuit protection.

10 MEMBER DENNING: Circuit separation.

11 MR. FRUMKIN: So when --

12 MEMBER DENNING: Separation of the --

13 MR. FRUMKIN: Right. So when a finding  
14 comes in, let's say we have that hypothetical finding,  
15 which opens up and drains down the RWST. The citation  
16 is going to be against 3G2, lack of separation and  
17 lack of protection.

18 Now, we don't require one protection  
19 method over another, but they didn't put a protection  
20 method in there to protect the -- well, RWST is a bad  
21 example because it is not a necessarily one-train  
22 system.

23 But let's say you have both trains being  
24 affected by a fire. And here this is probably what is  
25 the more likely scenario. One train is just going to

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1 be damaged by the fire and not work, and then the  
2 other train is going to have the spurious actuation.

3 We don't necessarily need both trains to  
4 have spurious actuations. So that's the situation.  
5 It doesn't have to be multiple spurious on multiple  
6 trains.

7 MEMBER APOSTOLAKIS: Have we agreed that  
8 the first bullet is not quite correct? We're asking  
9 for more than just information?

10 MR. FRUMKIN: It's clear.

11 MEMBER APOSTOLAKIS: Yes.

12 MEMBER DENNING: It just takes them a lot  
13 of work to do it. I think we all recognize that it's  
14 a request for information, but in order to produce  
15 that information, you have to do a lot of work.

16 MEMBER APOSTOLAKIS: Right. It sounds to  
17 me like the priest saying, you know, "I know you're a  
18 sinner, George. Now, you go away and think of all the  
19 ways in which you could be a sinner and come back and  
20 tell me what they are." I have thought about it.

21 CHAIRMAN WALLIS: It's already been  
22 analyzed.

23 MEMBER APOSTOLAKIS: I protected myself.

24 MEMBER DENNING: Let's go on. And I would  
25 like to hear the conservative risk analysis. And so

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1 would you give us a little presentation on the  
2 conservative risk analysis?

3 MR. FRUMKIN: Are you done with all of  
4 your slides?

5 MEMBER DENNING: Yes.

6 MR. WOLFGANG: Yes. I just want to say  
7 one thing. If we don't issue a generic letter, we'll  
8 have to use the inspection process behind these  
9 problems.

10 It will take longer. We estimate three  
11 triennials, nine years. And some risk-significant  
12 items may be missed. We don't know because the burden  
13 is put on us, instead of the licensee. I just want to  
14 bring it up.

15 MEMBER DENNING: Thank you.

16 MEMBER BONACA: Is it with regard to the  
17 90 days with the responses? I mean, how did you come  
18 up with the 90 days, recognizing that you have to go  
19 to award to provide these responses? Was there an  
20 evaluation that you performed?

21 MR. WOLFGANG: No.

22 MEMBER BONACA: I mean, can it be changed?

23 MR. WOLFGANG: It can be changed. It was  
24 an arbitrary period that we thought was --

25 MEMBER APOSTOLAKIS: Or you can reduce the

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1 requirement.

2 MR. WOLFGANG: Yes, or we can --

3 MEMBER APOSTOLAKIS: So we don't have  
4 these?

5 MR. FRUMKIN: No, you don't have these  
6 slides. We will be making them available.

7 MR. KLEIN: Just as a reminder, if I can  
8 just follow up on the 90-day issue and the comments in  
9 regard to that, we do have a bullet in there that, for  
10 licensees who can't meet that 90-day requirement, that  
11 within the 30 days, they come in and request an  
12 extension.

13 MEMBER MAYNARD: Yes. And I saw that in  
14 the generic letter. If it's a situation where you  
15 know 90 percent of the industry is not going to be  
16 able to do it, you might as well be able to pick a  
17 date where everybody is not having to do it. I'll be  
18 interested in hearing from the industry as to whether  
19 they think that is a burden or not. I think I am  
20 assuming it is, but it may not be. So I don't know.

21 MR. FRUMKIN: This is a bounding risk  
22 analysis for multiple spurious actuations. It was  
23 developed for this meeting by Ray Gallucci, Dr. Ray  
24 Gallucci, who is in the Fire Protection Section. And  
25 it's been presented as a paper for the American

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1 Nuclear Society presentation. I think this winter  
2 they're having a meeting.

3 I am the third string presenter of this  
4 document. Ray is the first string. Dr. Weerakkody is  
5 the second string. And I'm presenting out of  
6 necessity.

7 MEMBER DENNING: Is Ray here to get beaten  
8 upon if he --

9 MR. FRUMKIN: No. Ray is on inspection at  
10 Browns Ferry. So we have --

11 MEMBER APOSTOLAKIS: Last time he was here  
12 he --

13 MEMBER DENNING: No wonder he's at Browns  
14 Ferry.

15 MR. KLEIN: Let me clarify. He's on a  
16 program review at Browns Ferry. He's not on an  
17 inspection.

18 MR. FRUMKIN: Okay. I'm sorry. These  
19 slides will be made available. My understanding of  
20 this analysis is using an older plant PRA that Ray was  
21 involved in, he pulled out some of the important  
22 measures for some hot shorts. And he recombined them  
23 into multiple hot shots and, using a simplification  
24 process, determined a bounding risk analysis for those  
25 based on those important measures for one plant's PSA.

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1           So this is the typical older nuclear power  
2 plant, has a fire CDF of  $3.3^{-5}$ . And they used a hot  
3 short probability of .1. They had modeled 24 of the  
4 basic events. And that contributed about 5 percent to  
5 the fire CDF or  $1.8D^{-6}$ .

6           And then there were some systematically  
7 symmetric redundant train components that were chosen  
8 because I think they had more of a larger impact on  
9 the plant risk if they were to fail together. And  
10 that was a contribution of .03 to the fire CDF, those  
11 10 items.

12           MEMBER DENNING: Let's go slowly so we --

13           MEMBER APOSTOLAKIS: Yes.

14           MEMBER DENNING: -- understand what we  
15 have here.

16           MR. FRUMKIN: Okay.

17           MEMBER APOSTOLAKIS: Twenty-four hot short  
18 basic events above truncation. What does that mean?

19           MR. FRUMKIN: That in the model, the ones  
20 that had remained as important remained having  
21 importance measures in the model, that there were only  
22 24 hot shorts that remained there.

23           MEMBER APOSTOLAKIS: The core damage  
24 frequency due to hot shorts is  $1.8 \cdot 10^{-6}$  per year, it  
25 says.

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1 MR. FRUMKIN: Correct, assuming a hot  
2 short probability of .1.

3 MEMBER APOSTOLAKIS: Which was low.

4 MR. FRUMKIN: Which is low based on  
5 current data.

6 MEMBER KRESS: Okay. So one, it would be  
7 1.8 times  $10^{-5}$ .

8 MR. FRUMKIN: If you said 1.0, correct.

9 MEMBER DENNING: Now, you said that that's  
10 low, but don't forget here that now we're talking  
11 supposedly real nuclear power plants with fires where  
12 you would take into account the fact that the fire may  
13 not damage any cables, you know.

14 MR. FRUMKIN: Right. Well, this is from  
15 an --

16 MEMBER DENNING: Oh, this is --

17 MR. FRUMKIN: -- old fire PSA. So this  
18 does consider --

19 MEMBER DENNING: Yes, it does.

20 MR. FRUMKIN: -- many of those factors.

21 MEMBER DENNING: But saying that the  
22 probability of your hot short is .1 and saying, "Well,  
23 that is low," I think because we saw those other  
24 things where people say, "Well, it could be .6 or .2  
25 or something like that," --

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1 MR. FRUMKIN: Right.

2 MEMBER DENNING: -- and, therefore, this  
3 is low, that doesn't necessarily follow.

4 MR. FRUMKIN: I think this is the  
5 conditional hot short probability based on cable  
6 damage.

7 CHAIRMAN WALLIS: How about multiple  
8 shorts come into this?

9 MR. FRUMKIN: That is what we are going to  
10 be talking about.

11 CHAIRMAN WALLIS: This doesn't address  
12 that?

13 MR. FRUMKIN: No, no. Right. This is  
14 what this analysis is. So assuming that the  
15 components within each pair -- these are those ten  
16 items that have been paired -- have similar failure  
17 characteristics and locations, including their cable  
18 runs, again, this is a conservative assumption and  
19 that these comprise the full set of candidates for  
20 multiple spurious actuations that are not specifically  
21 modeled in the traditional IPEEEs as --

22 MEMBER APOSTOLAKIS: The number you showed  
23 us earlier assumes that these happen independently?

24 MR. FRUMKIN: Yes.

25 MEMBER DENNING: You know, I still don't

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1 understand the pairing. What is going on here? Is it  
2 ten corresponding to --

3 MEMBER APOSTOLAKIS: Ten of these?

4 MEMBER DENNING: Five paired components.

5 That means that there is a --

6 MEMBER APOSTOLAKIS: Redundant elements.

7 MEMBER DENNING: They're redundant

8 elements.

9 MEMBER APOSTOLAKIS: Yes.

10 MR. FRUMKIN: I believe what they did is  
11 of these 24, they took out 10 of them that could when  
12 combined have an issue.

13 MEMBER APOSTOLAKIS: They are still

14 located in the --

15 MEMBER DENNING: It could lead to

16 problems.

17 MR. FRUMKIN: On this slide, they're

18 independent.

19 MEMBER APOSTOLAKIS: Yes.

20 MR. FRUMKIN: But I think what we're going

21 to do is we're going to try to take out that and look

22 at them as pairs. So this is what we're going to do,

23 form a bounding analysis to estimate the potential

24 maximum CDF due to multiple spurious actuations for

25 this typical older MPP, which I think is what the

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1 target, the goal is here.

2 And now we start getting into some  
3 formulas. Per pair, one hot short corresponds to  
4 train A and the other to train B. So that's how they  
5 were paired. And they appear in symmetrically paired  
6 cut sets.

7 So one cut set, the CDF of A -- and  
8 there's the formula for that -- and the CDF of B,  
9 which is the fire initiator, and then the hot short or  
10 random failure of one of the paired components and  
11 then the summation of the B. Okay?

12 CHAIRMAN WALLIS: And where do the  
13 multiple shorts come in?

14 MR. FRUMKIN: This is the formula for --

15 CHAIRMAN WALLIS: It's between two trains,  
16 but it's not multiple shorts in the same cable.

17 MR. FRUMKIN: That's correct, not in the  
18 same cable.

19 CHAIRMAN WALLIS: It's still independent.  
20 And this formula that you have here, the cut sets, are  
21 still assuming that the --

22 MR. FRUMKIN: I think so. They're not  
23 going to be independent of the same fire and the same  
24 damage time, but they're going to be independent  
25 failures affected by the same fire.

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1 MEMBER APOSTOLAKIS: Conditional on the  
2 fire.

3 MR. FRUMKIN: Conditional on the fire.

4 MEMBER SIEBER: Which assumes the fire  
5 covers both things.

6 MR. FRUMKIN: Right, which is a  
7 conservative assumption in this analysis.

8 MEMBER SIEBER: Truly conservative.

9 MR. FRUMKIN: Yes.

10 MEMBER SIEBER: Improbable.

11 MR. FRUMKIN: Well, it depends on the  
12 design of the plant, but yes, it's --

13 MEMBER APOSTOLAKIS: So if I want to  
14 couple them, then, I will assume that Fa and Fb are  
15 just F, one fire. Is that correct? And then I will  
16 have --

17 MEMBER DENNING: A is --

18 MEMBER APOSTOLAKIS: Otherwise they are  
19 still independent. I mean, the fire initiator must be  
20 the same.

21 MR. FRUMKIN: Well, let's just hope that  
22 your answer --

23 MEMBER APOSTOLAKIS: We assume two  
24 different fires.

25 MEMBER DENNING: We'll go to the next

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1 slide. And maybe it will become clear.

2 MEMBER SIEBER: It's a lot clearer in  
3 here.

4 MR. FRUMKIN: Okay. So, again, we have --

5 MEMBER APOSTOLAKIS: This .1 comes from?

6 MR. FRUMKIN: The .1 was the  
7 state-of-the-art when they did this PSA of --

8 MEMBER APOSTOLAKIS: I'll tell you where  
9 it comes from.

10 MR. FRUMKIN: Okay.

11 MEMBER APOSTOLAKIS: That's 20 years or so  
12 ago.

13 MEMBER DENNING: You're responsible for  
14 .1?

15 MEMBER APOSTOLAKIS: I saw it, and I said,  
16 "Well, gee. How did you come up with that?"

17 So they said, "Well, call this guy"  
18 somewhere in California.

19 I called this guy. He says, "Well, you  
20 know Sandia told us that."

21 "What Sandia?"

22 "This person."

23 So I called this person in Sandia. He  
24 says, "Well, I really don't know. It's this other  
25 guy."

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1           So I called this other guy. And he says,  
2 "You told us that."

3           (Laughter.)

4           MEMBER DENNING: So we're going to accept  
5 the .1.

6           MEMBER APOSTOLAKIS: It wasn't followed up  
7 at all. I mean, that was the funniest thing.

8           MR. FRUMKIN: The IPEEE assumed this hot  
9 short probability of .1. And then I believe we're  
10 doing a simplification of these factors here. And it  
11 actually gets very simple on the next slide, but if  
12 anyone really wants me to read through this, I can  
13 try.

14           MEMBER DENNING: You know what we'll do?  
15 Let's go to the bottom line.

16           MR. FRUMKIN: The bottom line.

17           MEMBER DENNING: And we'll have copies of  
18 this.

19           MR. FRUMKIN: Okay. Yes.

20           MEMBER DENNING: And we'll --

21           MR. FRUMKIN: Okay. This is, I believe --  
22 well, let's see.

23           MEMBER APOSTOLAKIS: No. This is --

24           MR. FRUMKIN: This is the bottom line  
25 here.

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1 MEMBER APOSTOLAKIS: Go back a little bit.

2 MR. FRUMKIN: I think --

3 MEMBER APOSTOLAKIS: This Fa plus Fb I  
4 don't understand. I thought it was going to be 1.5.

5 CHAIRMAN WALLIS: That's two fires, isn't  
6 it?

7 MEMBER APOSTOLAKIS: This is one or the  
8 other, yes, one or the other.

9 MR. FRUMKIN: Yes.

10 MEMBER APOSTOLAKIS: It doesn't really --  
11 I mean, he should have assumed one fire as far as I  
12 can tell. But, again, the --

13 MEMBER DENNING: We will look at it  
14 carefully.

15 MEMBER APOSTOLAKIS: -- connection is  
16 nothing, I mean, right?

17 MEMBER DENNING: We will look at it  
18 carefully later.

19 MR. FRUMKIN: Right. That would be a  
20 small difference.

21 MEMBER DENNING: And Ray's bottom line  
22 again is?

23 MR. FRUMKIN: Okay. Well, what he does  
24 here is he's taking out the  $1.1E^{-6}$ . And he's putting  
25 in this value or coming up with this value of .011,

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1 which is his surrogate simplification for all of the  
2 fires and his X factor, which is his fire and his  
3 failure factor.

4 MEMBER APOSTOLAKIS: He's bounding the  
5 random failures, right, by assuming a  $10^{-3}$ , right?

6 MR. FRUMKIN: I believe so.

7 MEMBER APOSTOLAKIS: Yes.

8 MR. FRUMKIN: Typical, right.

9 MEMBER APOSTOLAKIS: But he doesn't know  
10 how many -- oh, this is a bound on all random failures  
11 that are required.

12 MR. FRUMKIN: Yes.

13 MEMBER DENNING: Continue. Let's see.

14 MR. FRUMKIN: Okay. And now he's talking  
15 about the dual failures. Any of the ten paired hot  
16 shorts would appear in the cut sets. And Fa is the S,  
17 which is your severity factor, which going to reduce  
18 your likelihood of more hot shorts, which is the  
19 likelihood of having a big fire that's going to cause  
20 this damage.

21 CHAIRMAN WALLIS: Which affects both  
22 trains?

23 MR. FRUMKIN: Right. And then your  
24 various factors, A hot, B hot short, and then your  
25 random factors.

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1 MEMBER APOSTOLAKIS: Why square? Why A  
2 hot times A hot? It still assumes that they're  
3 independent events, right?

4 CHAIRMAN WALLIS: Well, that is the A hot  
5 times B hot --

6 MEMBER DENNING: It is going to take us  
7 some time to really work through this. Rather than do  
8 this here, --

9 MR. FRUMKIN: Okay.

10 MEMBER DENNING: -- let's go see Ray's  
11 bottom line.

12 MR. FRUMKIN: Okay. The bottom line is  
13 here.

14 MEMBER APOSTOLAKIS: All right.

15 MR. FRUMKIN: So for his choice of fires,  
16 for severity factor, I think he used a .1 for this  
17 extreme fire, which is an S.

18 CHAIRMAN WALLIS: Why is .1 extreme? It  
19 could be .5.

20 MR. FRUMKIN: Oh, no, no, no. This is for  
21 the likelihood of a large fire.

22 CHAIRMAN WALLIS: Yes. But just asking  
23 George Apostolakis by telephone tag --

24 MR. FRUMKIN: Oh, no. This is not his .1.

25 CHAIRMAN WALLIS: I thought it was his .1.

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1 MR. FRUMKIN: It's somebody else's .1.

2 MEMBER APOSTOLAKIS: This is from one of  
3 my students.

4 MR. FRUMKIN: That's right. Right. This  
5 .1 is from very likely the fire protection STP, which  
6 says that severe fires happen or ten percent of all  
7 fires that happen are severe, which is, again, a  
8 conservative number based on the state-of-the-art,  
9 which is the 6850 analysis.

10 But that's what we're doing with -- I  
11 mean, this is no question about it. This is a  
12 bounding analysis.

13 CHAIRMAN WALLIS: The ones that cause hot  
14 shorts?

15 MR. FRUMKIN: No. Instead of using a  
16 severity factor of one, assuming that all fires will  
17 cause the damage, we're only assuming that ten percent  
18 of the fires will cause the damage to cause hot short.  
19 So there are many different ways of severity --

20 MEMBER APOSTOLAKIS: So this .011, .011,  
21 is the frequency of fire or, no, this is from the  
22 random failure?

23 MR. FRUMKIN: Right.

24 MEMBER APOSTOLAKIS: According to one is  
25 one?

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1 MR. FRUMKIN: That's the severity factor.

2 MEMBER APOSTOLAKIS: What is the frequency  
3 of fire?

4 MR. FRUMKIN: What I believe he has done  
5 is I believe he has back-calculated through his  
6 simplification that .1 that he used. And he's turned  
7 that, the whole -- all of his important measures into  
8 this .011.

9 MEMBER APOSTOLAKIS: So that includes the  
10 frequency of fire?

11 MR. FRUMKIN: I believe so.

12 MEMBER APOSTOLAKIS: That's a pretty high  
13 number.

14 MR. FRUMKIN: Yes.

15 MEMBER DENNING: We are going to look at  
16 this carefully, but his bottom line is saying, well,  
17 what this could do in this particular case is it could  
18 have increased by a factor of three the fire damage  
19 frequency.

20 MR. FRUMKIN: I think what he's trying to  
21 say here is that when he back-calculates from his  
22 importance measures and then he combines these pairs,  
23 that -- and this is the bottom line here -- he can  
24 have a maximum of  $10^{-4}$  per year due to these pairs of  
25 hot shorts.

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1 MEMBER DENNING: And without it, they had  
2 3 times  $10^{-5}$  is what this plant did.

3 MR. FRUMKIN: Yes. That's the whole fire  
4 risk for the plant, is 3 times  $10^{-5}$ . So this could be  
5 dominating.

6 MEMBER APOSTOLAKIS: But why couldn't you  
7 go to an actual PRA and fix, instead of whatever they  
8 had, and see what happens, rather than doing this  
9 undue analysis? I mean, there are detailed fire PRAs  
10 out there.

11 MR. FRUMKIN: We don't actually have one  
12 in the office. He did have this information available  
13 to him.

14 MEMBER DENNING: What I would like to do  
15 is we would definitely like copies. Don't go  
16 anywhere.

17 MR. FRUMKIN: Okay.

18 MEMBER DENNING: And I don't think you  
19 have to read that. What we would like -- I mean, you  
20 can actually --

21 MR. FRUMKIN: Well, here his last slide is  
22 at least for a typical older nuclear power plant, one  
23 cannot a priori dismiss multiple hot shorts of being  
24 of lower significance.

25 MEMBER DENNING: Okay.

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1 MEMBER APOSTOLAKIS: Well, I would like to  
2 see the paper, please. No, no. Give me a copy.

3 MEMBER DENNING: Right. Yes, if we may.  
4 What we would like to do now is we would like to hear  
5 now from NEI, if we could. Don't run away, Research.

6 MEMBER APOSTOLAKIS: Don't anybody go  
7 away.

8 MEMBER DENNING: Don't anybody leave town  
9 other than me, but I would definitely like to make  
10 sure we have plenty of time to hear from NEI.

11 MEMBER APOSTOLAKIS: That's what I call  
12 running and meeting with --

13 MEMBER DENNING: The policeman is asked to  
14 lock the doors.

15 MEMBER APOSTOLAKIS: We have a cop  
16 outside?

17 MEMBER DENNING: And, Alex, you don't have  
18 handouts, but we can make them. Is that a true  
19 statement?

20 MR. MARRION: No, I do not have handouts.  
21 I do have a couple of comments.

22 MEMBER DENNING: You have comments?

23 MR. MARRION: Yes.

24 MEMBER DENNING: But you don't have any  
25 papers?

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1 MR. MARRION: No.

2 MEMBER DENNING: Okay. Please proceed.

3 MR. MARRION: Good morning. My name is  
4 Alex Marrion. I am a Senior Director of Engineering  
5 at NEI, and I appreciate the opportunity to offer a  
6 couple of comments on our perspectives on what we  
7 heard this morning.

8 Before I begin, I want to point out that  
9 we have two utility representatives, one from Progress  
10 Energy and one from Duke Power, who represent the two  
11 pilot plants for the application of NFPA 805.

12 And if the Committee so desires, I think  
13 it may be useful for you to understand the  
14 implications of this generic letter on the NFPA 805  
15 risk-informed application process. And I'll defer to  
16 you to --

17 MEMBER DENNING: We so desire.

18 MR. MARRION: Okay. Very good. Now I'll  
19 ask them to step up when I finish my comments.

20 To get back to Dr. Apostolakis' --  
21 George's comment, --

22 (Laughter.)

23 MR. MARRION: -- the test protocol and the  
24 issue of having cables exposed in the flaming region,  
25 I don't have any direct knowledge of that discussion

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1 with the NRC staff at the time we developed the test  
2 protocol. This was the first I heard of it, but I'll  
3 look into it. And we'll try to get an answer to you  
4 at the end of the week.

5 I do want to make it clear that we believe  
6 the multiple spurious actuation is a new regulatory  
7 position that results in significant impact on utility  
8 licensees, not only on the Appendix R, the NUREG 0800  
9 plants but also on the NFPA 805 plants.

10 The impact is significant in that it  
11 changes the methodologies that the utilities have  
12 credited in their licensing basis over the last 20  
13 years. So the licensing basis has to change.

14 Now, with that, it's perfectly appropriate  
15 for the NRC to say, "There's new information that has  
16 been brought to bear on this topic. And we have a new  
17 position." That's fine. But the NRC must bear the  
18 burden of demonstrating the safety impact of that new  
19 position and do a regulatory analysis to substantiate  
20 it because of the significant implications on the  
21 utility licensee design basis.

22 That's straightforward, but one thing that  
23 this position does not take into account is the  
24 fundamental elements of defense-in-depth relative to  
25 fire protection. What I'm talking about is the

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1 actions that are taken by licensees in preventing  
2 fires from occurring and detecting a fire when it does  
3 occur, having systems and personnel to respond to the  
4 fire to mitigate the consequences of the fire,  
5 suppression and detection systems, and then ultimately  
6 recovering the plant to assure that you can get into  
7 a safe condition.

8 We understand there is value to looking at  
9 risk-informed approaches and changes and assumptions  
10 and evaluating them accordingly, but I would recommend  
11 that we not lose sight of the defense-in-depth  
12 concepts as we go through this process going forward.

13 This generic letter is another example of  
14 what is fundamentally flawed with fire protection  
15 regulations and has been a problem with fire  
16 protection regulations and the associated regulatory  
17 process over the last 25 or 35 years.

18 And by that, I mean we have a continuous  
19 evolution of NRC positions and expectations that are  
20 addressed in a somewhat informal manner. And by that,  
21 I mean use of generic communications to articulate  
22 regulatory positions is, quite frankly, inappropriate.

23 New regulatory positions should be  
24 evaluated in terms of safety impact or clearly  
25 demonstrating the compliance issue associated with

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1 that new position. Then that has to be made publicly  
2 available so that the licensees can understand what  
3 these new positions are and what the basis for the  
4 positions are.

5 Historically in fire protection, it's been  
6 a plant-specific fire protection engineer from the  
7 licensee to an NRC inspector agreement of what the  
8 understanding is relative to an interpretation. And  
9 that is the problem that we're trying to fix. That's  
10 why we are so firm in our comments going forward,  
11 because fundamentally, gentlemen, if we don't address  
12 or we don't identify resolution to the spurious  
13 actuation issue today, it will be an issue for the  
14 NFPA 805 plants.

15 Going to 805 does not provide a resolution  
16 to this issue today because there is no understood  
17 methodology that can address the staff's position. I  
18 want to make that very clear.

19 MEMBER APOSTOLAKIS: Is this the  
20 open-ended issue that we discussed earlier?

21 MR. MARRION: Yes, yes. The comments made  
22 about CRGR approval of this generic letter, as an  
23 external stakeholder, that essentially is meaningless  
24 to us, reason being we are not privy to any kind of  
25 disciplined process that is used by CRGR or anyone

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1 within the NRC that clearly demonstrates this is the  
2 basis for the safety concern or this is the basis for  
3 the compliance concern.

4 What we have seen over the years -- and  
5 this is another example -- where the preferred route  
6 appears to be, well, let's make it a compliance  
7 concern because we as a regulatory agency, the NRC,  
8 can interpret the regulations. We have the right to  
9 interpret the regulations, et cetera, which is fine,  
10 but let's put the interpretation on paper. Let's  
11 identify resolution path so we have a common  
12 understanding going forward. We don't have that today  
13 on this particular issue.

14 Lastly, I would like to say that there  
15 isn't a generic letter that is simply a request for  
16 information. It should be clear from the discussion  
17 this morning that this generic letter basically  
18 imposes a new regulatory requirement that has  
19 significant impact on the licensing basis of current  
20 plants. That is not a request for information.

21 Those are the comments that I wanted to  
22 make this morning. I don't know if you have any  
23 questions on anything I said.

24 MEMBER DENNING: Yes, we do have some.  
25 One of them has to do with the timing, the 90 days,

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1 and the timing required to do the kind of analysis  
2 that's being requested there. Do you have a feeling  
3 as to what an appropriate time would be?

4 I mean, there's a timing that says, are  
5 you in compliance with this, which, regardless of this  
6 question, whether it's a new regulation or an old,  
7 there's no question the plant can determine that  
8 fairly quickly. But doing the entire analysis and  
9 determining what affected SSCs are, do you have any  
10 indication from the plants as to how much time that  
11 might take and what an appropriate time frame would be  
12 for a response like --

13 MR. MARRION: I don't have the information  
14 to answer the question, but I would submit that the  
15 next two individuals may be able --

16 MEMBER DENNING: May be of help on it?

17 MR. MARRION: -- to give you their  
18 perspectives.

19 MEMBER DENNING: Okay. Good.

20 MEMBER MAYNARD: Could I just --

21 MEMBER DENNING: Yes?

22 MEMBER MAYNARD: Your perspective comment  
23 was made that if the generic letter is not issued,  
24 then it would just have to be dealt with in inspection  
25 space. Do you have any comment on that?

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1 MR. MARRION: It is being dealt with in  
2 inspection space. Now, what we don't have is an  
3 external stakeholder. When I mention "we," I'm  
4 speaking of NEI and the industry. What is the safety  
5 case or what is the compliance case? And we haven't  
6 seen evidence of that clearly demonstrated that NRC  
7 action in this particular area is necessary in an  
8 expedited manner.

9 VICE CHAIRMAN SHACK: Just to address your  
10 methodology question, apparently you can deal with  
11 multiple actions if they come sequentially. So you  
12 have a methodology for that. And you're arguing that  
13 there isn't a methodology.

14 So it isn't necessarily the open-endedness  
15 of it that's the problem?

16 MR. MARRION: There isn't a methodology  
17 for addressing all spurious actuations in a given  
18 fire. Utilities had --

19 VICE CHAIRMAN SHACK: You can address them  
20 one at a time.

21 MR. MARRION: You can address them one at  
22 a time. And I would ask that the two utility  
23 representatives explain their methodology for circuit  
24 analysis. I think we would find that very insightful.

25 MEMBER DENNING: Good.

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1 MR. MARRION: But it's changed. And then  
2 what I would like to do is ask Dave Miskiewicz from  
3 Progress Energy and Harry Barrett from Duke Power.

4 CHAIRMAN WALLIS: I would bring up the  
5 point before you leave --

6 MR. MARRION: Yes?

7 CHAIRMAN WALLIS: You talked about the  
8 role of a generic letter and whether it just requests  
9 information. We have another generic letter on sumps,  
10 which you may be aware of, right?

11 MR. MARRION: I am generally aware of that  
12 one.

13 CHAIRMAN WALLIS: It not only requested  
14 information. It requested analysis, and it requested  
15 plans. And, in fact, it's resulted in large changes  
16 in the plant by a result of a generic letter.

17 MR. MARRION: Yes.

18 CHAIRMAN WALLIS: So it's not as if this  
19 is a unique generic letter, which is actually asking  
20 plants to do much more than just supply information.

21 MR. MARRION: My only point is a request  
22 for information as this generic letter is  
23 characterized as a mischaracterization of what its  
24 impact is.

25 CHAIRMAN WALLIS: Well, it clearly isn't

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1 that. I mean, it says a request for information and  
2 taking additional actions. I mean, the sentence asks  
3 for more than just information.

4 MR. MARRION: Okay?

5 MEMBER DENNING: Okay. Let's have our  
6 visitors come up.

7 MR. FRUMKIN: If I could add? This is Dan  
8 Frumkin. Just one point. The inspections started  
9 again in January of 2005, but there is still currently  
10 enforcement discretion for all circuit findings. And  
11 so there may be a perception that this has not turned  
12 into an issue yet because of a lack of enforcement in  
13 this area.

14 So starting in September 2006, enforcement  
15 will proceed for plants that do not have enforcement  
16 discretion under NFPA 805. So I just want to put that  
17 out there that currently there are no enforcement  
18 actions in this area for plants that take compensatory  
19 measures and have correction action plans.

20 MEMBER DENNING: Introduce yourselves,  
21 please.

22 MR. BARRETT: Good morning. My name is  
23 Harry Barrett. I work at Duke Power. I'm the  
24 three-site lead for NFPA 805 transition for all three  
25 of these sites in Duke Power's nuclear fleets. I just

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1 wanted to say a few words about the multiple spurious  
2 issue as it affects 805.

3           Although 805 is a risk-informed,  
4 performance-based rule, it is based on your current  
5 licensing basis going forward. And if that is  
6 questionable, then your regulatory foundation that  
7 you're billing it on would be questionable in 805,  
8 which ends up leading to a lot more effort and a lot  
9 more analysis required for that.

10           So this multiple spurious issue is adding  
11 a significant amount of paperwork and analysis to 805  
12 transition. The original concept was you would take  
13 your fire protection licensing basis, map it over to  
14 the 805 requirements, and it was pretty much just a  
15 paper transition.

16           With this new multiple spurious and the  
17 complications that that adds to the fire PRA, we're  
18 looking at a significant amount of engineering effort  
19 that goes into that.

20           It's going to take us over two years to do  
21 the transition for Oconee, which is the first plant.  
22 And a lot of that, most of that, is the PRA in the  
23 multiple spurious issue.

24           MEMBER APOSTOLAKIS: Do you agree that it  
25 is an issue?

1 MR. BARRETT: I agree that it needs to be  
2 looked at. I have not seen a multiple spurious  
3 scenario that is risk-significant yet.

4 MEMBER APOSTOLAKIS: Do any of your plant  
5 have a detailed fire PRA?

6 MR. BARRETT: We have a fire PRA. We have  
7 --

8 MEMBER APOSTOLAKIS: Not IPEEE, though?

9 MR. BARRETT: We had an early '80s vintage  
10 fire PRA, but we are putting together a NUREG 6850,  
11 the new version of it.

12 MEMBER APOSTOLAKIS: Okay. So --

13 MR. BARRETT: We're doing that now.

14 MEMBER APOSTOLAKIS: It would be, then,  
15 possible for you to go back to that PRA and see what  
16 happens if you assume multiple --

17 MR. BARRETT: It assumed multiple in the  
18 original analysis. To use the core melt, we needed to  
19 use multiples for that particular analysis. So it  
20 included --

21 MEMBER APOSTOLAKIS: The number came out  
22 okay?

23 MR. BARRETT: It came out relatively high.  
24 I don't remember the exact number, but fire was a  
25 fairly significant contributor to risk in the --

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1 MEMBER APOSTOLAKIS: Not fire overall,  
2 but, I mean, this particular mode with --

3 MR. BARRETT: Spurious?

4 MEMBER APOSTOLAKIS: Yes.

5 MR. BARRETT: If I remember right, many of  
6 the combinations that we analyzed were within the  
7 bounds of the Appendix R analysis originally for  
8 control room evacuation. The main fire area that we  
9 got into trouble with the IPEEE or the fire PRA, the  
10 original one, was in our cable shaft going up to the  
11 control room, where we had just about every cable in  
12 the plant going through one area. And so --

13 MEMBER APOSTOLAKIS: It seems to me that  
14 --

15 CHAIRMAN WALLIS: Did you assume multiple  
16 spurious actuations, simultaneous, and all of this?

17 MR. BARRETT: In that particular PRA, we  
18 ended up having to go to multiple spurious actuations  
19 in order to get the core damage.

20 CHAIRMAN WALLIS: Okay. Including  
21 simultaneous actuations.

22 MEMBER APOSTOLAKIS: So it would be  
23 interesting, then, to compare your numbers and  
24 analysis with the bounding analysis that the NRC staff  
25 has done to see which one makes sense.

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1 I mean, it seems that we do have a body of  
2 knowledge there that at least I as a member of this  
3 Committee don't seem to have access to. I don't know  
4 whether the rest of the members are familiar with it,  
5 but I doubt it.

6 So, I mean, it would be nice to see that,  
7 especially since you have done it already, I mean.

8 MR. BARRETT: Yes. The original analysis  
9 was nowhere the rigor that 6850 requires now.

10 MEMBER APOSTOLAKIS: I understand that.  
11 I mean, you --

12 MEMBER SIEBER: It is just one plant. So  
13 it's not clear to me how you can extend that to some  
14 --

15 MEMBER APOSTOLAKIS: Yes. But it provides  
16 a basis for judging what Ray Gallucci did.

17 MEMBER SIEBER: It gives you an idea.

18 MEMBER APOSTOLAKIS: Yes. And also what  
19 kind of effort it takes to do it because under NFPA  
20 805, it seems to me that if you find -- as I recall.  
21 Maybe I'm wrong. As I recall, you're right. You're  
22 supposed to meet the regulations, but if you don't  
23 meet some of them, then you can argue in risk space.

24 MR. BARRETT: Right.

25 MEMBER APOSTOLAKIS: Right?

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1 MR. BARRETT: Right.

2 MEMBER SIEBER: You don't need to.

3 MEMBER APOSTOLAKIS: But you don't need to  
4 go back and comply. So, I mean, there is a way out of  
5 it depending on the quality of the risk assessment.

6 MEMBER SIEBER: That would be a basis for  
7 an exemption, but you can't just sit there and do  
8 nothing.

9 MEMBER APOSTOLAKIS: But is that  
10 consistent with a statement that it does a lot of  
11 work, paperwork? I mean, if you already have the PRA,  
12 why does it add a lot of work? But you just said  
13 that, right?

14 I'm sorry. I don't remember your name.

15 MR. BARRETT: Harry.

16 MEMBER SIEBER: The PRA is not  
17 state-of-the-art.

18 MR. BARRETT: Right. The original PRA is  
19 not state-of-the-art.

20 MEMBER SIEBER: They have to do the work.

21 MR. BARRETT: The one that they are doing  
22 now is state-of-the-art. They're using 6850 and --

23 MEMBER APOSTOLAKIS: When do you expect it  
24 to be completed?

25 MR. BARRETT: It should be complete by

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1 probably June of next year.

2 VICE CHAIRMAN SHACK: When you do your  
3 state-of-the-art PRA, you're going to consider  
4 multiple actuations, right?

5 MR. BARRETT: Yes.

6 MEMBER APOSTOLAKIS: Yes. So, I mean, is  
7 it clear to everyone? I mean --

8 MR. BARRETT: We are taking significant  
9 efforts to make sure we get our best chance at finding  
10 those multiple spurious risk --

11 VICE CHAIRMAN SHACK: But it seems to me  
12 that anybody doing a fire PRA is going to have to  
13 consider multiple --

14 MEMBER DENNING: Do they have to consider  
15 them as comprehensively as here? Because they will  
16 have screening criteria. And I guess can you tell me  
17 if you weren't -- you know, suppose you were not  
18 heading towards that.

19 If you are sitting there and you had to do  
20 this analysis, how long would it take you to do this  
21 analysis? And how difficult would it be to -- would  
22 you have to modify the plant to be able to accommodate  
23 it?

24 MR. BARRETT: I am not sure about that.  
25 What we would probably end up doing is using the

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1 guidance in NEI-0001, chapter 4, which is the risk  
2 analysis piece of that, which is, in essence, doing a  
3 mini PRA for the --

4 MEMBER DENNING: But you're not allowed to  
5 use that. I mean, by this generic letter, you're only  
6 allowed to do that if you're then going to look for  
7 exemptions.

8 MR. BARRETT: Right, yes. You're not  
9 doing 805. That's your only other --

10 MEMBER DENNING: Yes.

11 MR. BARRETT: I mean, you need to modify  
12 the plant or you --

13 MEMBER DENNING: Modify the plant. How  
14 long would it take you to do that analysis in --

15 MR. BARRETT: Guessing, I would say  
16 probably a year.

17 MEMBER DENNING: Probably a year. I mean,  
18 what is in here says 90 days.

19 MR. BARRETT: No way.

20 MEMBER DENNING: There's no way?

21 MR. BARRETT: No way.

22 MEMBER DENNING: You would think that --

23 MEMBER SIEBER: Well, you can tell in 90  
24 days roughly how long you think it's going to take you  
25 to do it.

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1 MEMBER DENNING: Absolutely.

2 MEMBER SIEBER: But that's not what  
3 they're asking.

4 MEMBER DENNING: But that's not what  
5 they're asking.

6 MR. BARRETT: I mean, your choices are to  
7 take your safe shutdown analysis and just say that  
8 everything in a given fire areas fails immediately.

9 MEMBER SIEBER: That is the way you used  
10 to do it.

11 MR. BARRETT: And you can't do it.

12 MEMBER SIEBER: No.

13 MR. BARRETT: I mean, with the acceptance  
14 criteria you have in Appendix R, having water level go  
15 out of the pressurizer, you can do that with just a  
16 couple of spurious actuations. If you do all of them,  
17 you're never going to make it. So I don't know how  
18 you do that in 90 days.

19 MR. WOLFGANG: This is Bob Wolfgang with  
20 again --

21 MEMBER DENNING: Go ahead, Bob.

22 MR. WOLFGANG: The 90 days, what we have  
23 currently in the generic letter is for functionality  
24 assessment. To submit any exemption requests,  
25 amendment requests, that's the six-month period.

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1 MEMBER DENNING: Yes, but what I am  
2 missing is to do the functionality assessment, don't  
3 you have to do basically the analysis?

4 MR. BARRETT: Yes. That is essentially an  
5 operability assessment. Are components operable? In  
6 order to know that, you have to do the analysis to  
7 know what gets damaged and when. There's no way  
8 you're going to do that in a short time, no way.

9 MEMBER DENNING: Dave, did you want to  
10 make some comments?

11 MEMBER SIEBER: Before we switch, one  
12 thing that you said that I think is important is you  
13 really can't get the core damage unless you have  
14 multiple spurious actuations.

15 MR. BARRETT: We have some singles that  
16 get us in trouble, and we're going to have to fix  
17 those. But as far as getting into the core damage,  
18 I'm not even sure --

19 MEMBER SIEBER: This would be opposing  
20 trains, too, right?

21 MR. BARRETT: Well --

22 MEMBER SIEBER: Train A, train B pairs.

23 MR. BARRETT: By the fire PRA methodology,  
24 you're really not even worrying about 3G2 or 3G3  
25 anymore. You're looking at fires anywhere and damage

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1 to all of the circuits.

2 MEMBER SIEBER: Right.

3 MR. BARRETT: So you're really looking at  
4 controlling fires and cable room fires and all of  
5 that. And, you know --

6 MEMBER SIEBER: But if you were to make  
7 the assumption that you only have one spurious  
8 actuation, you wouldn't get the core damage. And you  
9 could just say, "I don't need to do anything," right?

10 MEMBER APOSTOLAKIS: Well, it depends on  
11 what else fails.

12 MR. BARRETT: Yes. I think it depends  
13 largely on --

14 MEMBER SIEBER: It would be an on-fire --

15 MR. BARRETT: -- what other failures --

16 MEMBER SIEBER: -- a non-fire-induced  
17 failure, right?

18 MEMBER DENNING: There has to be a core  
19 damage frequency, though. I mean, when you said you  
20 wouldn't get core damage frequency with a single  
21 failure, you have to because you have other unrelated,  
22 but it's just very low.

23 MR. BARRETT: Also we are talking hot  
24 shorts here, but you also have fire-related damage,  
25 which takes the component out of service, which is not

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1 included in that spurious operation probability.

2 So it's a much more complicated things to  
3 get your arms around as far as loss of all electrical  
4 power, loss of indication, and all of that. It's more  
5 than that.

6 MEMBER DENNING: Yes?

7 MEMBER SIEBER: Thanks.

8 MEMBER DENNING: Dave?

9 MR. WOLFGANG: Excuse me.

10 MEMBER DENNING: Yes?

11 MR. WOLFGANG: This is Bob Wolfgang again.

12 So Duke's response to this generic letter  
13 would be we're addressing it. We're transition to  
14 NFPA 805. And we're going to address multiple  
15 spurious actuations in that transition.

16 MR. BARRETT: Yes, sir.

17 MR. WOLFGANG: And that is the total  
18 response we're looking for from --

19 MR. BARRETT: We will give you a schedule  
20 of when we think that will be done, yes.

21 MEMBER DENNING: Okay. If that is what  
22 you are asking for, you're going to have to change the  
23 generic letter.

24 MR. BARRETT: No.

25 MEMBER DENNING: My interpretation. Well,

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1 we'll look at that.

2 Dave, why don't you go ahead and say a few  
3 words?

4 MR. MISKIEWICZ: Okay. My name is Dave  
5 Miskiewicz. I'm from Progress Energy. I'm the lead  
6 PRA supporting the transition to 805 at all of our  
7 units.

8 MEMBER APOSTOLAKIS: PRA?

9 MR. MISKIEWICZ: I'm the lead PRA engineer  
10 supporting our transition.

11 MEMBER APOSTOLAKIS: I thought you said  
12 "elite."

13 (Laughter.)

14 MR. MISKIEWICZ: That does sound good.

15 A lot of the discussion I'm hearing, my  
16 perspective is probably a little bit different than  
17 the normal compliance.

18 MEMBER APOSTOLAKIS: That's why we want  
19 it.

20 MR. MISKIEWICZ: You know, there is  
21 uncertainty. And I am used to dealing with the  
22 uncertainty as how much probability I can assign to  
23 something, can I take credit for these actions and all  
24 the various things on there.

25 One of the things that strikes me is when

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1 I look at the bounding analysis and it seems like  
2 we're trying to get the best of both worlds. We want  
3 to address everything in totality and also assure that  
4 we don't have that risk.

5 You know, when I deal with traditional  
6 design basis, we are allowed one single failure. And  
7 we assume no off-site power. And we give an  
8 initiating event that happens, and that is a given.

9 PRA, we will look at multiple failures.  
10 And we may find things that are more vulnerable that  
11 weren't even addressed under compliance. And I see  
12 kind of a similar thing here except for instead of  
13 saying, "Address a single failure," we're looking at  
14 "You've got to find them all."

15 And that just seems like an impossible  
16 task. Even in the PRA world, we can model a lot of  
17 stuff, but we're still not going to get them all. But  
18 we try to find the significant things. We're trying  
19 to gear down to get the significant issues.

20 As far as the workload goes that I see on  
21 the generic letter, I think it would be significant.  
22 I'm not the circuit analysis person but when I start  
23 throwing in non-currently credited equipment into that  
24 list that I want circuits routed for and cables routed  
25 for, it is a big workload for the electrical guys who

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1 are going to be doing that work. And I would see that  
2 as a resource drain on the overall transition effort  
3 for me.

4 In fact, if I saw them, you know, all of  
5 a sudden, focusing on one area and not another area,  
6 I'm not even sure how they would be able to get all of  
7 them without doing the PRA perspective.

8 MEMBER APOSTOLAKIS: I am a little bit --  
9 I don't know what the right word is, but we keep  
10 talking about the workload. It seems to me we should  
11 be talking about the real issue.

12 Is there a real issue here? Is there a  
13 contributor to risk that we have not handled in the  
14 past or managed well? I mean, the workload I'm sure  
15 you will agree, too, it's a major contributor to risk.  
16 We have to do something about it.

17 MR. MISKIEWICZ: I agree.

18 MEMBER APOSTOLAKIS: And, you know, the  
19 thing that made me happy with Duke is that they are  
20 doing the PRA. They will consider the multiple hot  
21 shorts or spurious situations. Is your company doing  
22 something similar or --

23 MR. MISKIEWICZ: We are doing the PRA.  
24 And we're going to in the PRA model the hot shorts,  
25 the spurious actuations.

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1 MEMBER APOSTOLAKIS: According to the  
2 latest information we have and everything?

3 MR. MISKIEWICZ: When we say important,  
4 too, it's almost, you know --

5 MEMBER APOSTOLAKIS: You're not going to  
6 use .1? You're going to use .6, for example?

7 MR. MISKIEWICZ: We'll use whatever the  
8 methodology recommends.

9 MEMBER BONACA: You can go to Professor  
10 Apostolakis if you remember.

11 MEMBER APOSTOLAKIS: Give me a call. I'll  
12 tell you.

13 (Laughter.)

14 MR. MISKIEWICZ: It's .1. And we're  
15 working through those issues, but even doing that is  
16 going to be limited somewhat. You know, there are  
17 screening techniques and things used that we're going  
18 to work our way through as to which circuits really  
19 need to be evaluated.

20 MEMBER DENNING: Do you think the approach  
21 is clearly defined as to how you come up with a  
22 probability for these actuations?

23 MR. MISKIEWICZ: Right.

24 MEMBER DENNING: There is some randomness  
25 that one assumes in terms of which circuits can

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1 connect with which other circuits to --

2 MR. MISKIEWICZ: I think what we know now  
3 is better than what we knew ten years ago when we were  
4 dealing with this.

5 MEMBER DENNING: Yes. But it isn't  
6 obvious to me even what the best approach is to doing  
7 that within the fire PRA, let alone deterministically.

8 MEMBER APOSTOLAKIS: So the position,  
9 then, of at least you two gentlemen and maybe the  
10 industry is that this generic letter is unnecessary,  
11 that you are handling the issue of multiple spurious  
12 actuations via the PRA and as you transition to it --  
13 are you transitioning to 805?

14 MR. MISKIEWICZ: Yes, we are.

15 MEMBER APOSTOLAKIS: As you transition to  
16 805, you may have to come back to the NRC and, using  
17 risk arguments, request an exemption of some sort. Is  
18 that your position?

19 MEMBER BONACA: Well, I heard it  
20 differently.

21 MEMBER APOSTOLAKIS: What?

22 MEMBER BONACA: I heard it differently.  
23 I heard simply that the burden should be on the NRC to  
24 perform. Okay.

25 MEMBER APOSTOLAKIS: But they are handling

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1 it already.

2 MEMBER BONACA: Yes.

3 MR. BARRETT: We are handling multiple  
4 spurious in the PRA as part of the 805 transition.

5 MEMBER APOSTOLAKIS: And then what?

6 MR. BARRETT: And then we're going to  
7 follow the industry guidance and the regulatory  
8 guidance provided by the NRC. And depending upon  
9 where the thresholds fall in relation to the  
10 self-approval thresholds, if it's less than the  
11 self-approval threshold, then we'll end up  
12 self-approving an exemption in accordance with the NRC  
13 rules for 805 implementation.

14 MEMBER APOSTOLAKIS: Right, right.

15 MR. BARRETT: If it's over that threshold,  
16 then we'll end up having to --

17 MEMBER APOSTOLAKIS: Come back.

18 MR. BARRETT: -- contact the staff and  
19 work out whether we have to modify or whether we can  
20 leave the situation as is.

21 MEMBER APOSTOLAKIS: The conclusion one  
22 can draw from this is that you believe that this  
23 generic letter is unnecessary because there is already  
24 a process in place. Is that correct?

25 MR. BARRETT: For 805, for their plants.

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1 Not everyone is --

2 MEMBER APOSTOLAKIS: Why wouldn't another  
3 plant apply the same thing?

4 MEMBER SIEBER: It is an optional process.  
5 Some plants --

6 MEMBER APOSTOLAKIS: Oh, they don't --

7 MEMBER SIEBER: -- may decide not to do  
8 anything at all.

9 MEMBER APOSTOLAKIS: If they don't  
10 transition to 805, you mean?

11 MEMBER SIEBER: Yes.

12 MR. MARRION: If I may, Dr. Apostolakis,  
13 there are 40 plants that have submitted letters of  
14 intent to the NRC. The resolution of this issue for  
15 the 805 plans has yet to be determined. The approach  
16 is the use of the PRA, do the modeling -- all right?  
17 -- and then define that.

18 But that would be applicable to those 40  
19 plants. The other plants, the balance of the  
20 industry, have used any combination of the single  
21 failure to three or four failures.

22 You heard mention of NEI-001 that has the  
23 methodology, both -- two methodologies: deterministic  
24 and risk-informed. We piloted that at two plants.

25 And so we can't take credit for that

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1 anymore because of this new position with the generic  
2 letter. But I suspect that the solution will be had  
3 with the pilot exercise over the next several months  
4 to a year possibly and that that's the solution that  
5 needs to be evaluated for applicability to the non-805  
6 plants because, absent that, I don't see anyone coming  
7 up with a generic solution for the non-805 plants  
8 today. And it is going to be based upon PRA.

9 MR. MISKIEWICZ: Even in 805, though, when  
10 we do a fire PRA, there will be some iterative  
11 process. You know, we're dependent on the circuit  
12 analysis people giving us the information that we need  
13 to model. And so we're going to try to get risk to  
14 make sure we're modeling the right areas.

15 MEMBER SIEBER: Just the basic methodology  
16 of PRAs causes you to consider multiple spurious --

17 MR. MISKIEWICZ: If you model all of your  
18 singles and multiples from singles --

19 MEMBER SIEBER: That's the way it is.

20 MEMBER APOSTOLAKIS: But in the old days,  
21 in the first PRAs, I don't think we considered that.

22 MR. MISKIEWICZ: You modeled your singles.  
23 And they would combine in your results to give you  
24 multiples.

25 MEMBER SIEBER: Part of the process.

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1 MR. MISKIEWICZ: Yes. But you would still  
2 have to model the spurious event was a failure mode  
3 for that specific piece of equipment, --

4 MEMBER SIEBER: Right.

5 MR. MISKIEWICZ: -- which depends on the  
6 circuit analysis people telling you where that --

7 MEMBER SIEBER: So the philosophical  
8 discussion as to what the assumptions ought to be is  
9 sort of moot because the process of the PRA itself  
10 takes care of that if it's done thoroughly and done  
11 right.

12 MEMBER APOSTOLAKIS: One of the things  
13 that we don't do at this Committee is have  
14 presentations or briefings on the actual analysis that  
15 the industry is doing.

16 MEMBER SIEBER: Right.

17 MEMBER APOSTOLAKIS: I think that would be  
18 extremely beneficial to us if somehow we found a way  
19 to have the industry come and present a detailed PRA,  
20 fire PRA in this case. Anyway, that's a separate  
21 issue.

22 MEMBER DENNING: I think what we would  
23 like to do at this point is thank you gentlemen. And  
24 we may still ask you in the few minutes that we have  
25 left if we have some additional questions. We have

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1 the potential to hear about additional experimental  
2 work that could potentially change some perspectives,  
3 but I don't think we'll do that.

4 I think what we ought to do now is we  
5 would have some discussion while we still have the  
6 staff here and the industry here, we have some  
7 discussion? Would you agree, Graham, that we'll have  
8 some discussion here, see just kind of where we are  
9 sitting on this?

10 CHAIRMAN WALLIS: I was thinking about  
11 that. I think we certainly need discussion.

12 MEMBER SIEBER: Yes.

13 CHAIRMAN WALLIS: I think some of it needs  
14 to be in our working session, --

15 MEMBER DENNING: Yes.

16 CHAIRMAN WALLIS: -- rather than open  
17 session, but I think we can do some of it now. What  
18 little bit we can do now to clarify the situation  
19 certainly we should do now.

20 MEMBER ARMIJO: I have a question that may  
21 not be a discussion. Just in reading the staff's  
22 response to a lot of the comments received on the  
23 draft, there was reference to a lot of -- where is  
24 this thing, the screening tool, a risk screening tool,  
25 that the licensees develop a risk screening tool to be

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1 reviewed and approved by the staff.

2 This is a tool that would evaluate a  
3 variety of different multiple spurious actuations and  
4 sort them out and say, "These are the ones to worry  
5 about. And the rest we don't have to worry about."

6 What is your view? Does such a tool  
7 exist? Do you use such tools, both parties?

8 MR. MISKIEWICZ: We haven't kind of gotten  
9 to that step yet. I'm not exactly sure what the  
10 paragraph is you are referring to.

11 MEMBER ARMIJO: Yes. It's --

12 MR. MISKIEWICZ: But we can do  
13 sensitivities and say, "If I just fail the system, you  
14 know, a functional type of thing, if it's not  
15 significant, then I don't have to go down deeper and  
16 model all the individual spurious. I can screen it by  
17 saying it's not going to matter without doing the  
18 detailed modeling," you know.

19 MEMBER APOSTOLAKIS: The screening depends  
20 on a number of factors, this being one, but the other  
21 is the amount of fuel you have in your area, whether  
22 you can have a fire to begin with, the fire PRA.

23 MEMBER ARMIJO: I thought it was here is  
24 a large number of conductors that can cause spurious  
25 actuations of a large number of systems. And nobody

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1 has defined what scenarios are worrisome. It seems to  
2 me like it's a large number of mind-boggling barriers.  
3 And how do you sort those all?

4 MR. BARRETT: Let me address that.

5 MEMBER ARMIJO: Yes.

6 MR. BARRETT: One of the things that Duke  
7 has done -- and I think Progress is going to follow  
8 suit when they actually do their PRA -- is we have  
9 attempted to put our arms around the most significant  
10 multiples that we could think of by putting together  
11 an expert panel of people who know the plant, know the  
12 Appendix R design, no fire protection, and postulate  
13 these in an organized fashion, like going through  
14 PNIDs and plant design records to say, "All right.  
15 What are the real multiple spurious combinations that  
16 would really hurt me?" and capture those in scenarios  
17 so that they can be analyzed in detail in the fire PRA  
18 so that we can really look at the risk.

19 We're looking at it taking a three-pronged  
20 approach. We have the Appendix R analysis that says,  
21 "Here is all the safe shutdown stuff that I've got to  
22 have. Here are the cables and where they go in the  
23 plant. And then here is what gets damaged in each  
24 fire area."

25 And we take the expert panel. And we say,

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1 "Well, is there anything we missed? You know, is  
2 there something out there that because you end up  
3 flushing the toilet over here and you end up turning  
4 that light bulb on, the combination of things gets you  
5 something you didn't expect?" The expert panel is  
6 supposed to deal with that.

7 And then we also look at the PRA and true  
8 up all AOVs, true up all MOVs, and see if those kinds  
9 of things give us surprises that we didn't expect.  
10 Between the three of those, we think we're going to  
11 end up probably having 95 percent of the  
12 risk-significant scenarios.

13 MEMBER DENNING: For all of your plants,  
14 do you know where your cables are by tray?

15 MR. BARRETT: We didn't. We ended up  
16 having to pay to have that analysis done for us. I  
17 think it was originally determined in the '80s but was  
18 not captured in a database or anything. And we had to  
19 go back and --

20 MEMBER DENNING: But you had that for all  
21 your plants, do you?

22 MR. MISKIEWICZ: I wouldn't say all of the  
23 plants. That's a lot of work. In a lot of cases it's  
24 limited to the set of equipment that met the rule for  
25 the Appendix R compliance --

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1 MEMBER DENNING: It seems to say that --

2 MR. MISKIEWICZ: -- or our equipment that  
3 we want to credit from PRA perspective because there  
4 is risk-significant equipment in mitigation that is  
5 not within the scope of Appendix R right now. And  
6 that we'll add to the list. And some of those still  
7 need to be routed.

8 MEMBER DENNING: You do have additional  
9 cable routing that you would have to determine;  
10 whereas, you feel that you have already done the --

11 MR. BARRETT: There were some things in  
12 the PRA that we had not addressed in safe shutdown,  
13 and we're going to have to have --

14 MEMBER DENNING: Well, PRA is one thing.  
15 What about with this requirement? Does that change?  
16 Would you have to -- if this was imposed on you, do  
17 you think you have to do more cable tracing?

18 MR. BARRETT: What I'm talking about is  
19 our attempt to try to get our arms around all of the  
20 risk-significant scenarios.

21 MEMBER DENNING: Scenarios? Okay.

22 MR. BARRETT: So that's why we did the  
23 expert panel and all of that, to try to get our arms  
24 around things that we would have otherwise missed.

25 MEMBER DENNING: You keep saying

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1 "risk-significant." And we're in a space here where  
2 we're not necessarily risk-significant. It's broader  
3 than that.

4 MR. BARRETT: I think if you take all of  
5 the cables and you just fail them all and you say they  
6 all happen immediately, you're done.

7 MEMBER DENNING: You can't survive.

8 MR. BARRETT: Some of these areas you  
9 can't survive it.

10 MEMBER DENNING: Okay.

11 MEMBER SIEBER: On the other hand, from a  
12 risk standpoint, the set of cables that you have to  
13 know what the routing is becomes larger than the  
14 Appendix R set.

15 MR. BARRETT: Yes.

16 MEMBER SIEBER: But it is certainly not  
17 all of the cables. So there is going to be some  
18 physical work that has to be done if you don't have  
19 pull ticket. If you don't have the database, you  
20 can't --

21 VICE CHAIRMAN SHACK: In the NEI-001  
22 guidance, where, as I understand it, you do up to four  
23 failures, how do you select those four?

24 MR. BARRETT: A similar process with the  
25 expert panel and using Appendix R analysis, a similar

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1 process.

2 MR. FRUMKIN: This is Dan Frumkin from the  
3 staff.

4 One of the things that we have discovered  
5 about defining a failure is a lot of the analyses  
6 assume once spurious actuation, once spurious  
7 actuation, what the NEI or at least the risk, 2,403 --  
8 and I think NEI-001. They talk about multiple hot  
9 shorts.

10 Now, one pair of conductors coming  
11 together could cause numerous different spurious  
12 actuations. So I think that the staff and the --  
13 well, the staff has come out with 2,403 and has put it  
14 on the table.

15 We are looking for this hot short. That  
16 could cause whatever it could cause. We're not  
17 counting spurious actuations anymore. We're taking  
18 that hot short and saying, "Well, what could it  
19 cause?"

20 I think there was a situation where there  
21 was one cable or just a number, just a few conductors,  
22 or maybe it was even two conductors that could give an  
23 indication which could open all of 16 SRVs at one  
24 plant.

25 Now, a long time ago that might have been

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1 16 separate spurious actuations. And today we're  
2 looking at that as one pair of conductors coming  
3 together. And I think everybody is pretty much on the  
4 same page that yes, obviously if the circuits can  
5 cause all of those spurious actuations, we consider  
6 that.

7 MEMBER DENNING: Well, I guess a comment  
8 that I would have on generally what I have heard is  
9 that I think it's very clear that there are timing  
10 issues. If we go forward with the generic letter,  
11 then, at least in my interpretation of the generic  
12 letter, there are timing requirements that are not  
13 doable by the industry and that one would have to do  
14 some relaxation of that. And I don't see where just  
15 having the 30-day, where they can say, "It's going to  
16 take me longer as appropriate."

17 Now, it could be that maybe this should be  
18 more of an information-gathering generic letter,  
19 rather than one that is quite forcing the NRC's  
20 position about the need for multiple spurious  
21 actuations without a more relaxed position like NEI's.

22 I guess what I'm looking for are general  
23 comments as to people, where they are seemingly  
24 falling on this generic letter.

25 MEMBER MAYNARD: Well, I would agree with

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1 most of your comments there. First of all, I do  
2 believe that it clearly constitutes a backfit. We  
3 will get into some other things later on that, but we  
4 don't have to change regulations to be changing  
5 requirements. A change in staff position on what is  
6 acceptable for meeting a regulation, changing those  
7 position, also constitutes a backfit.

8 With that said, I would also like to say  
9 that this issue needs to be resolved. I think playing  
10 around too long about what is the right regulatory  
11 process isn't going to serve everybody's best interest  
12 either.

13 I think it is important. This issue has  
14 been around for 25 years. It needs to get resolved in  
15 an approach going forward as to what is it going to  
16 take to either make it go away as an issue or to  
17 actually fix it.

18 I think the 90 days, I think basically if  
19 it goes out the way it is, basically you're going to  
20 end up with everybody coming in with time request  
21 extensions. And so I don't think that's really the  
22 right thing to do there.

23 If it goes out the way it is, I think it  
24 needs to extend that time. I think it might be better  
25 to go out with what is truly an information request,

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1 to gather information to then be able to determine  
2 what the next steps are.

3 But, again, I don't think process should  
4 drag out for another 5 or 10 or 15, 20 years.  
5 Something needs to be done to put it on a resolution  
6 path.

7 VICE CHAIRMAN SHACK: Let me just come  
8 back to that for a second. I mean, we know what you  
9 expect from the 40 plants that are going for NFPA 805.  
10 What do you expect from the others?

11 MR. WOLFGANG: This is Bob Wolfgang again.

12 I think a number of them are going to come  
13 back and say, "We meet our licensing basis, and thank  
14 you very much. And good-bye."

15 MEMBER DENNING: Will they really say  
16 that? I mean, your --

17 MR. WOLFGANG: That is one thing.

18 VICE CHAIRMAN SHACK: Will you accept that  
19 answer?

20 MEMBER SIEBER: Send it over to  
21 enforcement.

22 MR. WOLFGANG: No. No, we won't. What we  
23 will hear from others is --

24 VICE CHAIRMAN SHACK: What would you  
25 consider an acceptable response from the others?

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1 MR. WOLFGANG: Well, "We don't address  
2 multiple spurious actuations. Here is our plan to  
3 address it to do" X, Y, Z. I don't know. "Do  
4 physical mods."

5 MEMBER DENNING: That's a six months'  
6 answer.

7 MR. WOLFGANG: Yes. That will be the  
8 six-month answer. But initially, yes, either you meet  
9 it or you don't meet it. We don't think we meet it.  
10 We think we meet it.

11 For the first round, that's all I think  
12 we're going to get.

13 MEMBER DENNING: Getting back to this  
14 backfit question, I'm not sure that ACRS is the  
15 appropriate one to answer that. Obviously it makes it  
16 easier for the regulatory staff if it's not a backfit  
17 question.

18 MEMBER BONACA: Yes. One thing that  
19 troubles me a little bit is, you know, is it a  
20 significant issue or is it not a significant issue?  
21 That's a plant-specific answer. And so we're not  
22 going to find out an answer to the question.

23 And I think that if we had to perform a  
24 generic evaluation to justify a backfit, I'm not sure  
25 that it could be done because, I mean, it's so

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1 specific to the plant, the age, to whatever the  
2 situation may be.

3 MEMBER DENNING: But this question of a  
4 specific issue, I think you can do a reduced analysis  
5 to determine. I think you can screen out stuff a  
6 priori --

7 MEMBER BONACA: I think so, too.

8 MEMBER DENNING: -- you know, so that it  
9 isn't such an onerous job to determine what's  
10 important and what's a potentially significant risk  
11 contributor here.

12 MEMBER BONACA: Clearly, I mean, something  
13 has to be done. I mean, we have new evidence in front  
14 of us. And I completely agree with you, Otto, that it  
15 can't wait. They have to be dealt with.

16 I think that, however, the industry needs  
17 more time to deal with this. They don't have a  
18 ready-made process by which they can screen this out  
19 and address it. So the issue is more the time.

20 Now, the next statement again, as reported  
21 to you, is the fact that we are not really the best  
22 charges of what is the most appropriate regulatory  
23 process to follow to go ahead with this.

24 MEMBER APOSTOLAKIS: Our job here is to  
25 judge the generic letter as presented to us.

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1 MEMBER BONACA: Yes.

2 CHAIRMAN WALLIS: I am just wondering how  
3 we add value to this. If we were a subcommittee, we  
4 might well say, "Look, we now know what the issues  
5 are. We think there must be a better way than having  
6 the agency send out this generic letter asking for  
7 things which may be impractical for some plants," but,  
8 then, there should be some way to work with the plants  
9 to figure out what is the right solution to this  
10 technical problem. I'm not sure.

11 We're also sort of a facilitator between  
12 industry and the agency, and that's not really our  
13 job, though, is it?

14 MEMBER SIEBER: Well, the other thing that  
15 is not our job is to try to figure out whether it's a  
16 backfit or not. That's a legal question.

17 CHAIRMAN WALLIS: Well, we don't even know  
18 how important it is because we don't have these proper  
19 risk analyses.

20 MEMBER DENNING: Well, having resolved  
21 these questions, I now turn it back to you, Mr.  
22 Chairman.

23 (Laughter.)

24 CHAIRMAN WALLIS: I can make a very  
25 decision, which is to take a break for lunch. We are

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1 going to be ethics-trained at 12:15. And then we go  
2 to work again at 1:30. Thank you very much for your  
3 presentations.

4 We'll take a break, and as a Committee,  
5 we're going to be back here, not on the transcripts or  
6 anything, for ethics training at 12:15. We'll start  
7 the official proceedings again at 1:30.

8 (Whereupon, a luncheon recess was taken  
9 at 11:33 a.m.)

A-F-T-E-R-N-O-O-N S-E-S-S-I-O-N

(1:33 p.m.)

CHAIRMAN WALLIS: Back into session. The next item on the agenda is another generic letter; first of all, underground cable failures that disable accident mitigation systems.

Our cognizant member is Mario Bonaca. I will hand over the meeting to him. Please go ahead, Mario.

MEMBER BONACA: Thank you, Mr. Chairman.

3) DRAFT FINAL GENERIC LETTER 2006-XX,

"INACCESSIBLE OR UNDERGROUND CABLE FAILURES THAT  
DISABLE ACCIDENT MITIGATION SYSTEMS"

3.1) REMARKS BY THE SUBCOMMITTEE CHAIRMAN

MEMBER BONACA: We have a presentation from the staff. They are proposing to issue a generic letter on inaccessible underground cable failures that disable accident mitigation systems.

We have recently become conversant with this issue through license renewal. You may remember that the GALL report requires for license renewal the existence of two programs: one, a program to detect the presence of water and the watering actions; and the other one is a program to test the cables and essentially-- so we are aware of the concern here.

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1 And the staff is now addressing this issue in the  
2 current licensing area.

3 And so, with that, I will turn to the  
4 staff. Mr. Mayfield?

5 3.2) BRIEFING BY AND DISCUSSIONS WITH  
6 REPRESENTATIVES OF THE NRC STAFF

7 MR. MAYFIELD: Good afternoon. I'm Mike  
8 Mayfield, the Director of the Division of Engineering.  
9 And my division is sponsoring this generic letter.

10 We're here this afternoon to seek ACRS  
11 endorsement to publish the generic letter. The  
12 generic letter, as Mr. Koshy will describe, provides  
13 some information to licensees on the significance of  
14 these potential failures, and seeks some information  
15 from licensees regarding the monitoring of these  
16 cables.

17 Tom Koshy from the Electrical Engineering  
18 Branch will make the presentation.

19 MR. KOSHY: Thank you, Mike.

20 As Dr. Bonaca mentioned to you, this was  
21 first brought to your attention as a problem during  
22 the license renewal hearing at the ACRS. The question  
23 was, is dewatering every ten years going to prevent  
24 the problem?

25 At that time, in light of the failures

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1 that we had noticed at the time, we thought of taking  
2 it as an operating reactor issue under Part 50. And  
3 we did some serious looking into see how big the  
4 problems are.

5 The safety concerns identified at the time  
6 were some of these underground and inaccessible cables  
7 supply power to some safety-related components. Using  
8 some examples here, the off-site power, the cable that  
9 brings the off-site power, to the safety buses.

10 The second would be the emergency diesel  
11 generator feeder. This is critical in those cases  
12 where the emergency diesel generator to building is  
13 physical apart from the main building so that the  
14 underground cables bring into power; and then the  
15 emergency service water pumps, these cases where the  
16 pump house is located again, you know, physically away  
17 from the plant so that the power supply to the service  
18 water pump has to go through underground cables.

19 And failure of one of these cables could  
20 affect multiple systems in these sense there could be  
21 a train, cooling off of safety systems, collectively  
22 influencing more than just one isolated system.

23 Most of these failures that we came across  
24 did not have any direct reference to having a  
25 qualification for this cable to withstand the moisture

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1 environment or, essentially, you know, in duct banks,  
2 if it is immersed in water, you know, can it  
3 withstand. That type of qualification had not been in  
4 existence for these cables that we came across.

5 MEMBER BONACA: Let me understand now,  
6 however. These are cables in safety-related  
7 applications?

8 MR. KOSHY: Yes.

9 MEMBER BONACA: Okay. So evidently on day  
10 one, when the plant was built, there was no  
11 expectation that the cable would be wetted?

12 MR. KOSHY: Yes. In fact, they thought it  
13 would stay relatively dry, but as duct banks develop  
14 cracks, you know, there would be traffic about it.  
15 And eventually these things crack. And depending on  
16 the water table, you know, it could be immersed for a  
17 long time or maybe a short time.

18 MEMBER BONACA: Well, in many cases, these  
19 cables are buried --

20 MR. KOSHY: Yes.

21 MEMBER BONACA: -- in the ground. So from  
22 day one, there was an expectation that they would see  
23 humidity and why we are not environmentally qualified.

24 MR. KOSHY: Either it was not specified at  
25 the time or they thought that, you know, the existing

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1 material at the time could withstand some level of  
2 moisture. For some reason, they did not specifically  
3 seek out.

4 The reason I stated that is, you know,  
5 much in the later period, now we have cables that can  
6 withstand such highly moist environment. In fact, I  
7 know of a case where they have run the cable to the  
8 river. That's for a --

9 CHAIRMAN WALLIS: But not forever.

10 MR. KOSHY: Excuse me?

11 CHAIRMAN WALLIS: Just because they are  
12 qualified doesn't mean they will survive forever in  
13 this environment.

14 MR. KOSHY: You are right, yes. Yes.  
15 They may not survive forever, but at least, you know,  
16 they have some demonstrated capability for a certain  
17 period that it can be even immersed in water and still  
18 do its function.

19 But all of that addresses, you know, the  
20 possibility that you need to know the condition of the  
21 insulation so that you have that confidence that it  
22 can do its function for the foreseeable future.

23 We went back into the history of the LERs  
24 that we have on record. We saw failure at 17 sites  
25 and cable replacements at 100 or so. And most of the

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1 faulty cables were not discovered until there was an  
2 operational failure.

3 Again, these are based on LERs, where the  
4 system has a redundant system or some reason, because  
5 of a plant trip or the failure was serious enough it  
6 prompted an LER.

7 MEMBER ARMIJO: What is your definition of  
8 a medium cable?

9 MR. KOSHY: 5 kV.

10 MEMBER ARMIJO: And above?

11 MR. KOSHY: 5 kV. Well, in the sense of  
12 when you go into 13 kV, you know, some people label it  
13 as medium also.

14 MEMBER ARMIJO: Okay.

15 CHAIRMAN WALLIS: High tension.

16 MEMBER SIEBER: Four-eighty volts to --

17 MR. KOSHY: Four-eighty will be below  
18 that. Yes. We will not call that medium, yes.

19 MEMBER SIEBER: Four-eighty is --

20 MEMBER BONACA: But you include those?

21 MR. KOSHY: Excuse me?

22 MEMBER BONACA: But you include those in  
23 the --

24 MR. KOSHY: Yes, we are including those  
25 because there are certain plants where the emergency

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1 diesel generator generates voltage at 480 and  
2 emergency service water and safety pumps are at 480  
3 volts, some small plants and early vintage.

4 MEMBER BONACA: Okay.

5 MR. KOSHY: So we wanted to include that  
6 also. That's why we went more than just medium  
7 voltage.

8 The EPRI data indicated about 65 cable  
9 failures. And later the white paper which NEI has  
10 submitted indicated about 55 failures for about 15  
11 plants.

12 Most of the cable failures have what in  
13 common? It's about 12 years of age. And the cable  
14 was subjected to some type of, you know, moisture  
15 environment, probably for a longer duration or a  
16 shorter duration. And these things were essentially  
17 common factors.

18 The cables, again, that we are focusing on  
19 is about roughly about six to eight cables, you know,  
20 depending on the design uniqueness, the cables that  
21 can have the most, let's say, significant impact on  
22 the plant.

23 MEMBER MAYNARD: The cable was about 12  
24 years old? You're saying that all of these failures  
25 were about the same age or --

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1 MR. KOSHY: No. More than that. There  
2 are some 20-plus.

3 MEMBER MAYNARD: Okay. All right.

4 MR. KOSHY: Yes.

5 CHAIRMAN WALLIS: It was at least 12 years  
6 old. At least 12 years. I was trying to figure it  
7 out. If it's every 12 years, that's pretty severe.

8 MR. KOSHY: You're right. Twelve and  
9 above. So in this generic letter, what we are  
10 focusing on is power cables that are within the scope  
11 of the maintenance rule, including cables connected to  
12 off-site power, emergency service water, and the other  
13 examples that I stated before, and those routed  
14 through underground or inaccessible locations, such as  
15 buried conduits, cable troughs, above-ground and  
16 underground. And these are the things that we are  
17 considering to be within the scope of this generic  
18 letter.

19 The benefits of this program are gaining  
20 confidence in the capability of the cable to respond  
21 to design bases events. To give you an example, at  
22 Turkey Point after the hurricane, the diesel had to  
23 run for about a week continuously. And thereafter for  
24 a month's period, the diesel had to come back on for  
25 other spurious power outages.

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1           So if you are looking into an accident  
2 where it has to be on a LOOP condition where these  
3 cables may need to be relied on for a few weeks. So  
4 we are not looking at a few hours of operation. The  
5 confidence needs to be gained for a period much higher  
6 than a few hours, which is usually the subject of our  
7 maintenance and surveillance activities.

8           MEMBER BONACA: Do you have examples of  
9 failures in service that were not exhibited during  
10 functional testing?

11           MR. KOSHY: What we have, the reported  
12 failures are a combination of both. Some in-service  
13 failures certain plants appear to have more than  
14 others. And others, when you start for surveillance,  
15 you find out that, you know, after a couple of hours,  
16 it fails.

17           So the LERs that we recorded are those  
18 cases where the plant impact was significant, so in  
19 the sense either operational. And if it is purely  
20 during a surveillance, we will not get an LER report  
21 on it.

22           So that's some of the problem that we are  
23 facing. The LERs that we received are so limited in  
24 number because, you know, it had to either bring a  
25 plant down or give an easy access situation for us to

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1 plant an LER report.

2 So that's why we are focusing on getting  
3 a handle on the extent of failures so we can engage  
4 them and see what other actions would be necessary.

5 CHAIRMAN WALLIS: Could you explain  
6 something to me?

7 MR. KOSHY: Yes.

8 CHAIRMAN WALLIS: I can understand  
9 off-site power sort of coming in on the underground  
10 cable. Why is diesel generator? Why does the diesel  
11 generator have underground cables? Is it part of the  
12 plant?

13 MR. KOSHY: Yes. For example, in some  
14 plants, the building is a separate building.

15 CHAIRMAN WALLIS: It's in a separate  
16 building. It's in a separate building.

17 MR. KOSHY: Yes. For example --

18 CHAIRMAN WALLIS: Okay.

19 MR. KOSHY: -- they have separate  
20 building.

21 CHAIRMAN WALLIS: They might be in a  
22 separate building?

23 MR. KOSHY: Yes.

24 CHAIRMAN WALLIS: That's very different  
25 from, say, something that comes from off-site power,

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1 where the cable may be a long cable from --

2 MR. KOSHY: Yes. That will be  
3 significantly longer. That will be from the  
4 switchyard. In some cases, you will have a situation  
5 closer to the plant, where you bring down to 13 kVR or  
6 so.

7 CHAIRMAN WALLIS: Okay. Thank you.

8 MR. KOSHY: The next benefit is we can  
9 prevent the unanticipated failures that cause plant  
10 transients by using the maintenance rule as the scope.  
11 We are also looking at challenges to the plant in the  
12 sense of what will give you a plant transient. So  
13 that is what is seen as the scope of this generic  
14 letter.

15 The next is you can use a convenient  
16 outage if you know the rate of degradation. Rather  
17 than taking, you know, unwarranted outages, you can  
18 schedule that cable replacement for a convenient  
19 refueling outage and do the replacement with minimum  
20 interruption.

21 CHAIRMAN WALLIS: Are these cables usually  
22 designed so they can easily be pulled through to  
23 repair them?

24 MR. KOSHY: No. It is very  
25 time-consuming, most of the --

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1 CHAIRMAN WALLIS: There's not a big duct  
2 in the cable and you just drag through a new cable?

3 MR. KOSHY: No.

4 CHAIRMAN WALLIS: No? You have to take it  
5 out? You have to dig it up?

6 MEMBER SIEBER: It's the whole thing. No.

7 MR. KOSHY: Well, pull-through is there,  
8 but the thing is it has a lot of staging. And you  
9 have energized equipment on both sides. So you need  
10 to essentially take some bus outages. So it is  
11 significantly time-consuming.

12 CHAIRMAN WALLIS: Yes, but you don't have  
13 to dig it out?

14 MR. KOSHY: Unless it is direct buried  
15 cable.

16 MEMBER BONACA: In fact, I mean, for  
17 example, yesterday during the review of Monticello,  
18 the majority of their underground cable, they're  
19 buried.

20 CHAIRMAN WALLIS: Those are usually  
21 utility duct or something, in other words.

22 VICE CHAIRMAN SHACK: This is direct  
23 buried.

24 CHAIRMAN WALLIS: Direct buried cable?

25 MR. KOSHY: Those are not exceptions.

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1 Usually you will have a duct bank with some sleeves in  
2 there so that you can pull through it.

3 MEMBER BONACA: And it depends on the age  
4 of the plant. I mean, Monticello is an older plant.  
5 They buried it, and that was it.

6 MR. KOSHY: So you have a wide variety on  
7 those?

8 MR. MORRIS: Tom, George Morris, EEEB.  
9 Some of the original cables that were pulled through  
10 duct bank, all of the original cables that were pulled  
11 through duct bank, were pulled through with the use of  
12 cable lubricant to reduce the friction. After they  
13 had been in there for a while, that lubricant has  
14 dried up.

15 MEMBER BONACA: It doesn't work.

16 MR. MORRIS: In some cases, it's almost  
17 like concrete.

18 MR. KOSHY: Okay. Moving on to some  
19 examples, Ocone is a success story where they found  
20 that two of the six cables had significant  
21 degradation. And they were able to monitor it and  
22 take the outage at a convenient time so that they can  
23 replace them.

24 Another example I am using here is Peach  
25 Bottom. When they experienced a failure, they decided

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1 to make a global replacement. You know, they didn't  
2 want to do any testing at all. And that's also a  
3 solution.

4 CHAIRMAN WALLIS: Now, is it always water  
5 that leads to degraded cables? It seems to me that  
6 you could have a cable and a duct which might just --  
7 you know, the insulation can over a period of time  
8 oxide or whatever it does. I mean, even in your house  
9 without water, you get cables that --

10 MR. KOSHY: Yes.

11 CHAIRMAN WALLIS: The insulation cracks  
12 and so on.

13 MR. KOSHY: This has some influence in the  
14 sense if it is a dry insulation and there is only  
15 cracks, chances are it will survive a little longer.

16 CHAIRMAN WALLIS: That's right, but it may  
17 --

18 MR. KOSHY: The presence of chemicals --

19 CHAIRMAN WALLIS: Makes it work.

20 MR. KOSHY: -- create default.

21 CHAIRMAN WALLIS: It's not essential that  
22 you have moisture, is it?

23 MR. KOSHY: Right. You're right. We are  
24 not trying to look at the root cause of what causes  
25 the failure. We are more interested in seeing,

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1       irrespective of the causes, let's have a program in  
2       place so that we can prevent such unanticipated  
3       failures and have a great confidence in the accident  
4       mitigation capability. So that's the focus we are  
5       trying to get because for --

6                   CHAIRMAN WALLIS: There is no routine  
7       measurement of, say, resistance of ground of a cable?  
8       There is no routine --

9                   MR. KOSHY: There is some technology  
10      developing that way, but online systems have not been  
11      doing that well. I think the industry is headed that  
12      way and there is some aggressive effort in the  
13      industry for coming up with something like that or,  
14      rather, building confidence in the systems that are  
15      now under development.

16                   Oyster Creek is an example where they  
17      replaced the cables and they had few repeated  
18      failures. This design is also unique. They  
19      essentially had this cable going about 200 feet away  
20      from the main plant as an extension of the safety bus.  
21      And this is remaining energized all the time. And  
22      that earlier had several failures.

23                   So the information that we are requesting  
24      is provide to us a history of the cable failures in  
25      the scope that I discussed just before and a

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1 description and frequency of the inspection, testing,  
2 and the monitoring programs in place. And if you do  
3 not have a monitoring program in place, explain to us  
4 why such a program is not necessary. So that is  
5 essentially what we are asking in --

6 CHAIRMAN WALLIS: So this is really  
7 information gathering. This isn't requiring an  
8 action?

9 MR. KOSHY: Right, right.

10 VICE CHAIRMAN SHACK: Now, are you  
11 distinguishing between a monitoring program and a  
12 functional testing program here?

13 MR. KOSHY: Okay. The explanation that we  
14 have given, in fact, I am addressing as a response to  
15 a public comment, what we are saying is the functional  
16 testing that you do that you energize for a short  
17 period doesn't give you any confidence that it will do  
18 it again.

19 VICE CHAIRMAN SHACK: Okay. So you're not  
20 counting that as a monitoring program?

21 MR. KOSHY: Yes. We are not.

22 MEMBER SIEBER: A surveillance test.

23 MR. KOSHY: These are the organizations  
24 that have given response to the first version that  
25 went out for public comments. And I will address the

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1 highlights of how we addressed those comments.

2 Cable failures are random. And,  
3 therefore, no NRC action is required.

4 CHAIRMAN WALLIS: It sounds like saying  
5 they're an act of God or something.

6 MR. KOSHY: Yes. We just explained the  
7 surveillance activity, which wouldn't give you  
8 confidence on its future performance. You need to in  
9 some way monitor the condition of that insulation so  
10 that we can build that confidence.

11 Again, you know, this is the small group  
12 of cable where you have this problem. Otherwise, the  
13 rest of the cable is in a dry environment. Next to  
14 selectable sealed-in concrete, you know, these cables  
15 should be the most reliable piece of equipment in a  
16 plant, you know, should not be failing for about 40  
17 years or, in fact, for 60 years, you know, if it is  
18 the environment and the conditions are right.

19 And I quickly explained before that the  
20 low-voltage cables are included because some of the  
21 early vintage plants have this 480-volt equipment for  
22 safety buses, diesel, and naturalized emergency  
23 service water, and service water equipment.

24 CHAIRMAN WALLIS: The original sentence is  
25 garbled. It doesn't matter. Essentially we have a

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1 period after impact, and that's all right. Scope is  
2 limited.

3 MR. KOSHY: Okay. Again, we just  
4 addressed this issue, why this basic surveillance  
5 tests of operating for a half an hour or two hours  
6 wouldn't be sufficient to gain that confidence for --

7 CHAIRMAN WALLIS: What you do is you put  
8 on them the voltage that they would have in operations  
9 and --

10 MR. KOSHY: No. You actually energize a  
11 --

12 CHAIRMAN WALLIS: Do you actually have to  
13 have current going? Do you have to current going  
14 through these cables to test them or does it have the  
15 voltage applied to them and see if there's a leakage?

16 MR. KOSHY: Yes. There are about eight or  
17 ten techniques in the industry.

18 CHAIRMAN WALLIS: There's a whole lot of  
19 techniques.

20 MR. KOSHY: Yes, yes. And the thing is  
21 the early technique was just apply very high voltage  
22 and make it fail. That was the most crude way of  
23 doing it.

24 MEMBER SIEBER: Meggering.

25 MR. KOSHY: Meggering is another method,

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1 but that has certain weaknesses, too.

2 MEMBER SIEBER: You have reflective  
3 techniques.

4 MR. KOSHY: Yes. Time domain reflects  
5 III, and about six or eight techniques are there. And  
6 there are still some under development. Collectively  
7 you have about two IEEE standards that go into details  
8 of the type of tests available and the level of  
9 confidence that you have based on the type of cable.

10 So depending on if you have a shield and  
11 what kind of shield and what type of rubber material  
12 is used, the level of confidence is different, you  
13 know, depending on the type of test that you do.

14 So there is some industry that two IEEE  
15 standards are available to address that and which one  
16 is better and which one is desired.

17 MEMBER SIEBER: You can get some pretty  
18 high voltages in these cables from switching  
19 transients.

20 MR. KOSHY: That's true.

21 MEMBER SIEBER: It will go well beyond the  
22 rating for a very brief period of time. And sometimes  
23 that's when the insulation fails.

24 MR. KOSHY: Yes.

25 MEMBER BONACA: By "surveillance test,"

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1 you mean surveillance of the equipment and this power  
2 by the cable?

3 MR. KOSHY: Right. You are giving normal  
4 voltage and normal function of a couple of hours, you  
5 know, like in the pump in service inspection or type  
6 of surveillance you will expect to run in for two or  
7 three hours, make sure it is for using the rate of  
8 flow and things like that. That's the type of test  
9 that will not give you a feeling of how good the  
10 insulation is. Will it last for the next two weeks of  
11 runoff?

12 The regulatory basis for our cable  
13 monitoring is we have added that what is seen in bold,  
14 that condition is something that we really did not  
15 have in the first version. And we are essentially  
16 saying that "assess the continuity of the systems and  
17 the condition of the components." So you need to know  
18 the condition of this insulation so that we can have  
19 that confidence on its performance.

20 MEMBER ARMIJO: Could you expand that?  
21 Condition based on electrical properties? Are you  
22 actually looking for physical condition? They're in  
23 accessible.

24 MR. KOSHY: These are inaccessible, but  
25 you do have state-of-the-art techniques available in

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1 electrical testing which will measure the testing of  
2 the insulation.

3 MEMBER ARMIJO: Okay.

4 MR. KOSHY: So if you can establish that  
5 the integrity of the insulation is reasonable, then  
6 you have that confidence that it will not fail in the  
7 most probable cases.

8 MEMBER ARMIJO: Thank you.

9 MR. KOSHY: The question was regarding  
10 multiple cable failures. The only example that we  
11 have collected in light of our efforts is a case where  
12 one insulation failure was in the circulating water  
13 pump, resulted in taking two other substations out  
14 with it.

15 The possibility that we are talking of is  
16 the fault itself causes a transient and sends some  
17 transient current. And if you have some near-failure  
18 equipment, that can be a cause for additional  
19 failures. You know, these are speculative problems.  
20 And this is the only example that we have on record  
21 for that.

22 Now, the modifications that we have done  
23 in light of the comments on this are editorial in  
24 nature, a good part. We revised the scope to include  
25 the above-ground and below-ground duct banks; removed

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1 the broadband spectroscopy because that's not a proven  
2 technique yet, but, again, that could be a technique  
3 available in the future; revised the requested  
4 information to include the type of service so that we  
5 will be able to know if there are repeated failures in  
6 a certain area. And we revised the data collection  
7 time to 60 hours.

8 CHAIRMAN WALLIS: So it would seem that  
9 there is still a gap between your view and the  
10 industry's view.

11 MR. KOSHY: Yes.

12 CHAIRMAN WALLIS: The industry had some  
13 pretty strong comments. And your modifications don't  
14 reflect large changes in response to their comments.

15 MEMBER SIEBER: Right.

16 CHAIRMAN WALLIS: So there would seem to  
17 be still a big gap between your view and the  
18 industry's view. Is that true?

19 MR. KOSHY: I will address that in the  
20 next slides along with the NEI white paper issues, in  
21 slides 16 and 17.

22 CHAIRMAN WALLIS: Okay.

23 MR. KOSHY: We presented this to CRGR.  
24 And CRGR asked us to do two improvements on the  
25 generic letter: to bring the focus on the power

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1 cables itself and also to add a safety-related example  
2 to show the significance of this failure on a plant.  
3 In the package that you have received, we have  
4 incorporated those changes.

5 We received the NEI white paper much after  
6 the comment period on May 1st. I have addressed the  
7 highlights in this coming couple of slides. One is a  
8 graded approach. Again, the number that you see on  
9 the top is the sections that correspond to the NEI  
10 white paper, 6.6.

11 The graded approach for monitoring and  
12 replacement of cables, the bullets are many cables do  
13 not power safety-related equipment; and the other one,  
14 graded approach to replacement and monitoring is best  
15 for safety and business reasons.

16 Our response is that we are only focusing  
17 on those that are significant. That's the very reason  
18 that we are using to bring the scope down to the  
19 maintenance rule. And we mentioned certain systems in  
20 there because to, let's say, overcome the variances  
21 and interpretations on that rule and also because  
22 those examples that we state there are the ones that  
23 have most impact on the plant in the sense affecting  
24 multiple systems.

25 Therefore, these are classified as most

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1 important because of these reasons. And, therefore,  
2 you know, it will be important to prevent the  
3 transients and also in supporting of mitigating the  
4 accident.

5 So that's how we have narrowed the scope  
6 and as to bringing down to only important cables and  
7 not all of the cables at large. And the numbers that  
8 you see in that white paper are some plants have like  
9 300-plus cables. And that won't be within the scope  
10 of maintenance rule.

11 The next one, the recommendations again in  
12 chapter 8, is provide dry environment, prepare for  
13 cable failures, and share failure resolutions.

14 Providing a dry environment -- again, you  
15 know, these are all installed cables. It's not quite  
16 practical. And pumping out would help. It will slow  
17 down the failure, but it cannot prevent the failure.  
18 It may take a little longer. And these cable failures  
19 could affect many systems. And the replacement of  
20 these cables is very time-consuming.

21 So if you have a valid accident mitigation  
22 method and at that time trying to make this cable  
23 replacement could be very difficult because the cables  
24 that run in the same duct banks could be helping the  
25 accident mitigation at that time. And your cable

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1 pulling and taking bus outages would not be desirable  
2 actions when you run into an accident environment or  
3 facing a LOOP or a station blackout.

4 And the technique is available there to  
5 have that reasonable confidence so that we can rely on  
6 these cables for continued operation.

7 That's all we have prepared for presenting  
8 to you. And if you have --

9 MEMBER BONACA: I have a question --

10 MR. KOSHY: Sure.

11 MEMBER BONACA: -- regarding in the  
12 generic letter, you talk about 23 LERs --

13 MR. KOSHY: Right.

14 MEMBER BONACA: -- and two monitor  
15 reports. Then the letter says that you believe that  
16 this is a very small fraction. That is the word used  
17 in the LER in the generic letter, a very small  
18 fraction of the actual failure to take place, which  
19 tells me that the number of failures that happen may  
20 be in the hundreds.

21 What is the projection? What does it mean  
22 that 25 in total is a very small fraction?

23 MR. KOSHY: It's very difficult to make  
24 such an estimate, but let me give a personal  
25 experience that I know of. I was at an AIT for a

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1 plant where they had such a cable failure. At that  
2 time they had six cable failures already when we had  
3 the AIT in the mid '80s. So that is repeated failures  
4 happening at one plant.

5 MEMBER BONACA: Okay.

6 MR. KOSHY: Again, I know of another  
7 Northeastern plant where they have all of these  
8 service water cable and emergency service water cables  
9 going through manholes. And they had splices in that  
10 also. And this manhole gets filled with water. And  
11 when the manhole cover knocks out, that's when you  
12 find out the splice failed. They had also quite  
13 repeated failures.

14 So certain plants may have a higher  
15 susceptibility because of groundwater and the design  
16 uniqueness. There may be some plants in absolutely  
17 dry environment, like WNP 2 in the middle of the  
18 desert. They may not have any cable problems because  
19 it's always dry. and if it all drains, it dries out  
20 so fast. So some plants may be fully exempt from this  
21 problem.

22 If the water table is a guide, those are  
23 the ones where you have high susceptibility and  
24 failures. And some plants are kind of glaringly  
25 different than others.

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1 MEMBER BONACA: The information you are  
2 requesting is regarding all cables, right, not only  
3 those in a weather condition?

4 MR. KOSHY: All cables and inaccessible.

5 MEMBER BONACA: Inaccessible.

6 MR. KOSHY: Yes.

7 MEMBER BONACA: Exactly. Okay.

8 MR. KOSHY: So plants where they did not  
9 have failures would not have anything to report. But  
10 if you had failures, we would like to know them --

11 MEMBER BONACA: Yes.

12 MR. KOSHY: -- so that we can kind of  
13 gauge, you know, are there repeated problems, what are  
14 the vulnerabilities, and based on that probably share  
15 the lessons and see if you have to take further  
16 action. Maybe it's down to a few plants. We do not  
17 know that because we lack the data to support that.

18 And the NEI white paper data shows about  
19 15 plants having about 45 to 50 failures. That could  
20 be an indication because they focused on underground  
21 and medium voltage only.

22 MEMBER BONACA: But your monitoring  
23 program that you're talking about doesn't deal only  
24 with cables that failed. It deals with cable aging  
25 that may be operable during functional testing that

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1 failed during demand, service.

2 So how are you going to gather information  
3 regarding these kind of cables?

4 MR. KOSHY: Okay. What we are saying is  
5 if those cables are within the scope of maintenance --

6 MEMBER BONACA: Yes.

7 MR. KOSHY: -- and they're underground and  
8 inaccessible, tell us if you have failures. And do  
9 you have a program when they have this susceptibility  
10 for failure to make sure that it wouldn't fail?

11 MEMBER BONACA: I understand.

12 MR. KOSHY: So you're not on the scope.  
13 Tell us what the failure is. And see how you monitor.

14 MEMBER BONACA: Right.

15 MEMBER ARMIJO: I have a question. How  
16 can you have a failure of above-ground inaccessible  
17 cable without water? Is it --

18 MR. KOSHY: Okay. What happens is, you  
19 know, even in some large conduit connections which go  
20 on the surface because of the variance, you get  
21 condensation built in there unless you have a way of  
22 venting it out.

23 MEMBER ARMIJO: Well, it could be a  
24 significant amount of water.

25 MR. KOSHY: You could collect all the

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1 time.

2 CHAIRMAN WALLIS: You get a humid day and  
3 a cold night.

4 MR. KOSHY: For the condensation and --

5 MEMBER SIEBER: You can get cable failures  
6 from things other than water.

7 MR. KOSHY: Yes, other chemicals and other  
8 leeching, yes.

9 MEMBER SIEBER: Chemicals, overheating.  
10 You know, that degrades insulation or defect in  
11 splices, for example, if --

12 MR. KOSHY: Yes. Splices is another  
13 vulnerable point.

14 MEMBER SIEBER: It's handmade.

15 MEMBER MAYNARD: A couple of questions.  
16 On the provided inscription of the frequency of all  
17 inspection testing, monitoring, are you talking about  
18 what is currently in place or are you asking the  
19 licensee to go back to day one for all of what testing  
20 has been done?

21 MR. KOSHY: We are asking for what you  
22 have in place now so that you can put in place such  
23 unanticipated failures.

24 MEMBER MAYNARD: Okay. And the other  
25 thing is, is the staff coordinating in any way? This

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1 is requesting this information to be within 90 days.

2 MR. KOSHY: Right.

3 MEMBER MAYNARD: And it would appear to me  
4 that if the other generic letter on the spurious  
5 actuation gets issued, a lot of the same resources  
6 could be required or needed for a lot of these  
7 activities, both dealing with electrical circuits,  
8 just --

9 MEMBER SIEBER: This one is pretty --

10 MR. KOSHY: We will work with the Generic  
11 Communications Division so that we would be sensitive  
12 to that.

13 CHAIRMAN WALLIS: So what are you going  
14 with the information when you get it?

15 MR. KOSHY: What we are hoping is that  
16 depending on, let's say, the breadth and depth of the  
17 problem as to why widespread, we may have to think of  
18 NRC action if that warrants it. We have --

19 CHAIRMAN WALLIS: You think that there  
20 might be some problem. You have this sort of you  
21 almost call it a fishing expedition, where you get all  
22 of this information. And then you look at it and say,  
23 "Aha. Now we have to do something or not." You're  
24 not quite sure what you are going to find.

25 MR. KOSHY: Okay. We know it is a

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1 significant problem in the light of what I explained  
2 to you.

3 CHAIRMAN WALLIS: There have been events,  
4 right.

5 MR. KOSHY: Yes. We have been having  
6 events, which either the plant is out or disabled  
7 safety systems. And those things kind of give you a  
8 flavor of significance.

9 CHAIRMAN WALLIS: But the result of all of  
10 this information gathering might be that you decide  
11 everything is okay as it is now.

12 MR. KOSHY: If the industry has, let's  
13 say, commitments to prevent such failures, yes. But  
14 if you are seeing failures and repeated failures, we  
15 have to rethink what we should be doing. Okay? We  
16 are not there yet. We need to --

17 MR. MAYFIELD: Professor Wallis, this is  
18 Mike Mayfield from the staff. As we assess the  
19 results we get back from this, we would have to make  
20 a decision whether generic action is warranted or is  
21 there some plant-specific action that is warranted or  
22 things are being managed appropriately as it is. And  
23 we just don't know until we get the results back. We  
24 have enough indicators to make us believe that we need  
25 to go --

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1 CHAIRMAN WALLIS: I think the industry  
2 response to the public comments was everything is  
3 fine, we're doing the right thing now. You just want  
4 the assurance that it really is so.

5 MR. MAYFIELD: That might be the outcome.  
6 And we'll have to see what actually comes in.

7 MEMBER SIEBER: The third question sort of  
8 tips your hand as to what you want. And it says if a  
9 monitoring or surveillance program is not in place,  
10 explain why such a program is not necessary.

11 In other words, here's a plant with  
12 failures. And they're not testing anything.

13 MR. MAYFIELD: We might want to chat with  
14 them a bit.

15 MEMBER SIEBER: You gave them the hint.  
16 You ought to test something.

17 MEMBER BONACA: Or you may have a plant  
18 where there have been no failures and you have no  
19 significant power equipment. Then why should you even  
20 have a test? I mean, then you have a threshold for  
21 saying, "We don't need it."

22 MEMBER MAYNARD: I've got a feeling when  
23 you get all of this, the actual number of failures if  
24 you divide it by the number of plants and the number  
25 of operating years wouldn't look that great, but when

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1 you go to group them, there may be some areas where  
2 you --

3 MR. MAYFIELD: Exactly. And that is not  
4 an uncommon outcome from getting this kind of  
5 information.

6 MR. KOSHY: One thing you find out is the  
7 data that we have at this time is based on normal run  
8 and surveillances, not an extended use of like two,  
9 three weeks. So what we are trying to see is gain  
10 confidence that these cables can continue in service  
11 for two or three weeks if there is a station blackout  
12 or some reason and we can continue to rely on these  
13 cables for that safety function.

14 MEMBER BONACA: Yes. That is a very  
15 important issue, you know, the failure to run. So the  
16 equipment starts, but then it won't run for as long as  
17 it has to. And that's trickier because, I mean, the  
18 number of failures experienced to date doesn't give  
19 you a specific insight on these cables. And that's  
20 their function.

21 MR. KOSHY: Right.

22 MEMBER BONACA: Any additional questions?

23 (No response.)

24 MEMBER BONACA: If not, I thank you for  
25 the presentation.

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1 MR. KOSHY: Thank you.

2 MEMBER BONACA: I think Mr. Marrion of NEI

3 --

4 MR. MARRION: Yes.

5 MEMBER BONACA: -- would like to make a  
6 statement. NEI, of course, produced that white paper  
7 that is quite interesting on this issue.

8 MR. MARRION: Good afternoon. I'm Alex  
9 Marrion, the Senior Director of Engineering at NEI.

10 I do have a couple of comments I want to  
11 make about basically what we heard. We haven't seen  
12 the staff disposition of the public comments that have  
13 been submitted. Nor have we seen the current version  
14 of the proposed generic letter.

15 But I have to tell you I am confused. And  
16 the reason for that confusion is that a couple of  
17 years ago, I received a letter from the Electric  
18 Systems Branch Chief articulating concern with a  
19 potential common mode of medium voltage cables. And  
20 the common mode failure mechanism was water training.  
21 This was based upon a review of 20-some odd licensee  
22 event reports.

23 We had a public meeting with the staff to  
24 understand, get a little more of an understanding of,  
25 their concerns. And we looked into the licensee event

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1 reports, and they had -- I'm trying to remember. I  
2 think there was only one or two that had a potential  
3 for being related to the water-training phenomenon  
4 that the staff was concerned with.

5 But it became clear to us that we needed  
6 to develop a document that would be an educational  
7 piece, if you will, primarily focusing for the  
8 industry, but we also felt that the NRC could possibly  
9 benefit from it. And that was the basic objective for  
10 the white paper that we developed.

11 The purpose for the educational piece was  
12 to articulate a clear understanding of the  
13 water-training phenomenon to articulate our assessment  
14 of the licensee event reports that the staff was using  
15 as a basis --

16 CHAIRMAN WALLIS: You're talking about a  
17 water-training phenomenon?

18 MR. MARRION: Water training, yes.

19 CHAIRMAN WALLIS: Training. Oh, I'm  
20 sorry.

21 MR. MARRION: Yes, water training. I'm  
22 sorry. I've got a cold, and I'm a little congested.  
23 I apologize.

24 CHAIRMAN WALLIS: That's my  
25 misunderstanding. I'm sorry.

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1 MR. MARRION: -- and also provide us a  
2 technically based understanding of the application of  
3 that phenomenon to basic cable configurations and  
4 insulation systems that exist in the power plants  
5 today or not in the power plants but exist in these  
6 applications today.

7 We concluded that you can't make a general  
8 statement that water training is of concern because  
9 it's not applicable to every cable configuration and  
10 insulation system that's in the field today.

11 It appears that the staff is attempting to  
12 require a cable-monitoring program. I'm not familiar  
13 with the details of the maintenance rule, but I know  
14 that the equipment to which these cables are  
15 terminated are monitored in the maintenance rule.

16 And since the cables aren't active  
17 components, I'm not sure whether they should be  
18 included in the maintenance rule or not. But  
19 fundamentally if the staff expectations and basis in  
20 this generic letter are not clear, you have the  
21 potential of a generic letter basically undermining a  
22 regulation.

23 I don't know if the staff has done a  
24 review with the maintenance rule folks within NRR, but  
25 I would recommend that be done before this is

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1 submitted.

2 CHAIRMAN WALLIS: You're implying this,  
3 but, in fact, they just say they're gathering  
4 information. And it's not clear that they intend to  
5 do anything which would change the regulation in any  
6 way or interfere with regulation. You don't know what  
7 they're going to do.

8 MR. MARRION: And the licensee has to  
9 document a justification of why they don't have a  
10 cable-monitoring program. That is --

11 CHAIRMAN WALLIS: But you're implying that  
12 something downstream is going to require this. That's  
13 not actually a --

14 MR. MARRION: No. I'm implying there may  
15 be a conflict between what the generic letter is  
16 asking for and what is required by the --

17 CHAIRMAN WALLIS: You're asking for  
18 information, rather.

19 MR. MARRION: Well, okay. That's one way  
20 of looking at it. It is a request for information or  
21 an attempt to require a cable-monitoring program. And  
22 I'll let you folks decide how you want to do that if  
23 they want to interpret that.

24 I think that, you know, the staff has made  
25 some comments about, you know, what their concern is.

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1 And it's not clear to me. I have to tell you I'm  
2 confused. Maybe it's because of our involvement over  
3 the past several years, but I have yet to see any kind  
4 of risk analysis or any kind of statistical analysis  
5 conducted by the NRC to articulate some level of  
6 confidence that they find unsatisfactory relative to  
7 the performance of the cable or the equipment.

8 We have attempted to do some statistical  
9 work in our white paper based upon the survey that we  
10 had conducted. I'm not happy with the fact that we  
11 didn't get 100 percent of the utilities to respond,  
12 but we got on the order of 80 percent, I think, 79.  
13 something. That has some benefit.

14 My concern at this particular point is  
15 when the generic letter is finally issued, based upon  
16 what I heard this afternoon, we're going to have to  
17 request a meeting, a public meeting, and probably  
18 document further clarification of what the NRC is  
19 really interested in this information request as they  
20 go forward because it's not clear at this particular  
21 point in time. And that's all I have to say. I would  
22 be more than happy to answer any questions you may  
23 have.

24 (No response.)

25 MR. MARRION: Okay. Thank you.

1 CHAIRMAN WALLIS: You're welcome.

2 You were suspicious that if they gather  
3 this information, then they might use it to require  
4 something which they wouldn't be able to do if they  
5 didn't have the information?

6 MR. MARRION: No. It's not clear what  
7 concern is trying to be addressed by the request for  
8 information.

9 CHAIRMAN WALLIS: Well, the concern is  
10 that these cables will fail. It's a simple concern.

11 MR. MARRION: Well, where does that  
12 concern stop? Do you stop at these cables or do you  
13 continue that concern at the equipment, et cetera,  
14 that is under continuous surveillance programs and  
15 testing? I mean, where does it end?

16 And it's a concern about having possible  
17 unanticipated failures? Well, where do you stop  
18 asking that question now that you started on medium  
19 voltage cables and the small population of medium  
20 voltage cables, I suspect?

21 So there are some real issues that have to  
22 be addressed here because the utilities are going to  
23 want to be responsive to the generic letter. My job  
24 is to make sure that we understand it adequately so  
25 the utilities will be responsive, but right now I'm

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1 not sure we have that understanding.

2 MEMBER BONACA: Well, if I understand it,  
3 I mean, the issue has to do with two things. One is  
4 inaccessible equipment that cannot be visually or  
5 other means inspected -- so it's a very narrow family  
6 -- and then equipment that is really in accepted  
7 applications.

8 And clearly equipment is seeing a water  
9 condition or wetness that -- so it's a pretty unique  
10 and narrow population, but I think at least I am  
11 interested to know what kind of equipment is being  
12 powered by this kind of cable out there. And if it is  
13 something critical, a generic letter or whatever,  
14 connection to off-site power, you know, it's a unique  
15 concern.

16 I mean, we addressed it and discussed it  
17 during license renewal because it was significant.  
18 And the industry and the NRC worked together on a goal  
19 inspection program for those cables.

20 And where does the aging start? I mean,  
21 does it start with a theatre of operation or does it  
22 start before? Clearly there is degradation taking  
23 place at some point. I realize I don't know all there  
24 is necessary to know about that.

25 MR. MARRION: If I may just offer a couple

1 of comments?

2 MEMBER BONACA: Yes?

3 MR. MARRION: The aging phenomenon begins  
4 from the time that the cable is shipped from the  
5 manufacturer's facility.

6 MEMBER BONACA: That's right.

7 MR. MARRION: And it's exacerbated by  
8 environmental conditions as well as operational  
9 conditions that wind up stressing the cable insulation  
10 system. And a submerged, wetted environment for  
11 certain insulation systems has the potential of  
12 increasing the aging or the rate of aging degradation,  
13 et cetera. That is well-known.

14 The equipment that's affected here  
15 includes diesel generators at some plants at 4,000 or  
16 4,160 volts as well as other plants at 6.9 kV. I  
17 don't know about -- I think one of the staff was --  
18 Tom made a comment about some diesel generators  
19 operating in the 480 volts. If that's indeed the  
20 case, then that's indeed the case.

21 But mean voltage cable in the industry is  
22 characterized as 2,000 to 15,000 volts. So I'm hoping  
23 that the generic letter will be very clear of  
24 articulating the 480-volt applications. And is it  
25 only for that particular piece of equipment or is it

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1 for something else? That's one of the points of  
2 clarity that's needed.

3 We tried to capture in our white paper --  
4 and I hope you've read it; we've made it available to  
5 you -- the current state of understanding of cable  
6 insulation systems at this voltage level and  
7 underground applications and which insulation systems  
8 are susceptible to water damage over time.

9 We have encouraged the utilities to  
10 prepare for such failures because if you look at the  
11 age of the fleet, we are approaching the end of  
12 service life of a lot of these cables. It's typically  
13 30, 35, 40 years based upon normal environmental  
14 conditions.

15 And our recommendation to the industry was  
16 don't wait for a failure before you have to deal with  
17 this problem because this is not the kind of cable  
18 that you typically keep large quantities in inventory  
19 at the warehouse, et cetera. And if you're not  
20 prepared, you will have an extended outage should you  
21 have such a failure.

22 I don't know if the generic letter is  
23 going to speak to that, but I also know that there is  
24 not a cable-monitoring system that is applicable and  
25 effective and available to the utilities today.

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1           There are some testing techniques that are  
2 effective for certain kinds of insulation  
3 configurations. And our white paper speaks to that.  
4 But based upon the information I have gotten from  
5 EPRI, who is pursuing research in this area, et  
6 cetera, that there isn't one technique that would be  
7 useful. So okay?

8           MEMBER BONACA: Thank you.

9           MR. MARRION: Thank you.

10          MEMBER BONACA: Yes. I think we're  
11 scheduled for some closing remarks. Is there?

12          MR. MAYFIELD: Just very briefly. We  
13 believe we have articulated why we need the generic  
14 letter. If indeed there is substantive confusion or  
15 misunderstanding once we have published the generic  
16 letter, we would, as always, be more than willing to  
17 meet with the industry and make sure that there is a  
18 common understanding of what we're asking for.

19          This generic letter has been in process  
20 for a while. And we do believe we need to move  
21 forward to get the generic letter published and allow  
22 licensees the opportunity to engage with it. We will  
23 be mindful of any conflicts with other generic  
24 communications that are going forward where we may be  
25 imposing unreasonable time constraints and resource

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1 constraints on the licensees. That's something that  
2 we will pay attention to and go back and pulse with  
3 the generic communication staff and the other  
4 technical staff to make sure we're online there.

5 With that, unless the Committee has other  
6 questions for the staff, I believe we have presented  
7 to you the information that we wanted to present. And  
8 we look forward to receiving a letter from you. Thank  
9 you.

10 MEMBER BONACA: Any other questions for  
11 Mr. Mayfield?

12 MR. FALLON: I have a question. Mike  
13 Fallon with Constellation Energy.

14 For the license renewal applicants that  
15 have submitted under the GALL report, these cables are  
16 all in the scope of license renewal, have been  
17 addressed in their applications. Are they being asked  
18 to resubmit this information again?

19 MR. KOSHY: This is Thomas Koshy.

20 This generic letter will fall under the  
21 Part 50 program, in which case we are addressing,  
22 let's say, something more than what was addressed in  
23 the renewal program. So there is a need for making  
24 separate submittal to the NRC in response to this  
25 generic letter.

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1 MR. FALLON: All of the cables that you  
2 have addressed, all of the safety-related cables, are  
3 in the scope of license renewal. And whether they're  
4 480-volt or they're medium voltage, they're addressed  
5 in those applications.

6 MR. MAYFIELD: Okay. Let me comment.  
7 This is Mike Mayfield from the staff.

8 You raise a good point. It is something  
9 we will look at and make sure we're not asking you to  
10 unnecessarily duplicate information. But that is a  
11 fair question, something that we'll make sure that --

12 MEMBER BONACA: Well, I am not aware that  
13 license renewal applications have the summary of all  
14 of the failures that have taken place. We are going  
15 to get to the information.

16 MR. MAYFIELD: We don't think we are in  
17 conflict, but it's a fair question. And we'll look to  
18 make sure we are not asking an unreasonable question.

19 CHAIRMAN WALLIS: But you will be looking  
20 at plants which doesn't necessarily have license  
21 renewal in prospect.

22 Are we through with this item now or --

23 MEMBER BONACA: Are there additional  
24 questions for the staff, for industry, for us?

25 (No response.)

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1 MEMBER BONACA: If none, I think it's  
2 over.

3 CHAIRMAN WALLIS: Thank you.

4 MEMBER BONACA: And we open it up back to  
5 you, Mr. Chairman.

6 CHAIRMAN WALLIS: Now, I really am  
7 reluctant to take a break for an hour. I wonder if we  
8 couldn't work on -- is it okay, staff who is an expert  
9 on this? Can we work on Mario's letter on this issue  
10 right now on just a preliminary basis?

11 Let's go off the record and work on his  
12 letter for half an hour or an hour.

13 MEMBER SIEBER: We have to come back.

14 CHAIRMAN WALLIS: Can we do that? You're  
15 not ready? We do have a draft letter. Will the  
16 Committee agree to work on his letter? We can discuss  
17 it now, but I think we can go off the record and  
18 discuss our reaction to this generic letter and work  
19 on our letter until about 3:00 o'clock. Is that okay  
20 with the Committee?

21 So let's do that. We'll come off the  
22 record now, and we will work on this letter until  
23 about 3:00 o'clock. We'll have some discussion now  
24 off the record.

25 (Whereupon, the foregoing matter went off

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1 the record at 2:25 p.m. and went back on  
2 the record at 3:18 p.m.)

3 CHAIRMAN WALLIS: We will come back on the  
4 record, come back into session.

5 CHAIRMAN WALLIS: The next item on the  
6 agenda is, let's see now, interim staff guidance. Is  
7 that what it is?

8 MEMBER BONACA: Yes.

9 CHAIRMAN WALLIS: And I will again call on  
10 Mario Bonaca to lead us through this one.

11 MEMBER BONACA: Okay.

12 4) INTERIM STAFF GUIDANCE AGING MANAGEMENT PROGRAM

13 FOR INACCESSIBLE AREAS OF BOILING WATER REACTOR

14 (BWR) MARK I CONTAINMENT DRYWELL SHELL

15 4.1) REMARKS BY THE SUBCOMMITTEE CHAIRMAN

16 MEMBER BONACA: We have the staff here to  
17 provide us with an overview on the proposed license  
18 renewal interim staff guidance on steel containment of  
19 BWR Mark I containments.

20 We have reviewed a number of BWRs. And  
21 we have often asked the question on the status of the  
22 steel liner. And we have seen different proposals by  
23 licensees, some of them planned inspections, only  
24 metric inspections. Some of the others don't.

25 And the staff is using a successful

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1 process that has been successful in most of the  
2 license renewal applications to date, the ISG process,  
3 as a means of proposing an approach that they expect  
4 the licensees to follow regarding this particular  
5 item.

6 And so the staff has come here to give us  
7 an overview of this process and what they are  
8 proposing to do. And I will let the staff go ahead.  
9 I don't know if Mr. Gillespie or Mayfield --

10 MR. GILLESPIE: Yes. If I could, just  
11 some opening comments to put in context what Linh and  
12 Hans are going to go through. Not only did we do a  
13 couple already, but we've got something like seven  
14 Mark I's lined up in the queue. And we have a number  
15 of very controversial ones in New Jersey,  
16 Massachusetts, and Vermont, where there is actually a  
17 lot of public interest. And we had no position on the  
18 liner itself.

19 There are some caveats or I'm going to say  
20 some wiggle room in this position I'd like to  
21 highlight to the Committee by way of how the staff is  
22 approaching this because a question at the meeting  
23 yesterday at Monticello was, why is it different plant  
24 to plant if you're trying to apply a consistent  
25 approach.

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1           This is kind of an approach for the plant  
2           that's got almost like the optimum conditions, of  
3           which Monticello with their leakage control programs  
4           and some things they were doing was.

5           Browns Ferry, an earlier one, which  
6           committed to doing some other measurements, actually  
7           had an operating history of having leaks. And so they  
8           had moisture content in there. And so we actually  
9           have -- this is a minimum condition, as we would look  
10          at it.

11          And there are also some wiggle words,  
12          quite honestly, in this. And that's where it says  
13          first you have to establish a degradation rate,  
14          basically. And then if you get moisture, this  
15          basically treats moisture in the outside of the shell  
16          the same as visible accelerated corrosion on the  
17          inside.

18          And we're using the ASME code kind of  
19          enhanced inspection, but, instead of referencing the  
20          code, we described the enhanced inspection in it in  
21          case the code changes in the future.

22          So we're bringing definition to an  
23          equivalence to inside and outside indications. And  
24          there is still a lot of room on how you establish the  
25          rate and what is the credibility of the rate.

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1           And so if you have a history as a facility  
2 of having leakage and, therefore, moisture in there,  
3 then I think the Committee should expect the staff in  
4 establishing the rate in those wiggle rooms because it  
5 says if you have moisture, reestablish your rate again  
6 -- and the only way to factually reestablish the rate  
7 is likely do a UT measurement and then connect the  
8 dots again. Literally a simplistic way of looking at  
9 it is a regression line between the now additional  
10 point.

11           And so Hans in his efforts as a reviewer  
12 still has a lot of room in what are the uncertainties  
13 in establishing the rate. And it's those  
14 uncertainties which kind of differentiate one plant  
15 from another. How do you reduce those uncertainties  
16 given different operating histories?

17           And so that's really how come Monticello  
18 is different from Browns Ferry. It's strictly  
19 operating history and the uncertainty involved with  
20 known moisture leak on multiple occasions.

21           So, with that, let me turn it over to Linh  
22 because that's just kind of the context. Linh, take  
23 it away.

24           4.2) BRIEFING BY AND DISCUSSIONS WITH  
25           REPRESENTATIVES OF THE NRC STAFF

1 MS. TRAN: Good afternoon. My name is  
2 Linh Tran. And I'm the Project Manager with the  
3 Division of License Renewal. And this is Hans Ashar.  
4 He's a senior civil engineer with the Division of  
5 Engineering.

6 We are here this afternoon to present the  
7 proposed license renewal interim staff guidance for  
8 the inaccessible area of the BWR Mark I drywell  
9 containment shell.

10 The purpose of this ISG is to provide  
11 guidance to future applicants on the information that  
12 is needed to be included in the license renewal  
13 applications for addressing the inaccessible area of  
14 the drywell shell.

15 Now, the proposed ISG here does not impose  
16 any no new technical requirement. And in previous  
17 license renewal application review by the staff, we  
18 usually can obtain the information in the applications  
19 or through the request for additional information.  
20 And usually we will get the information from the  
21 applicant.

22 The information provided by the applicant  
23 is sufficient for the staff to make its determination.  
24 However, it is not the most efficient way because of  
25 the RAI back and forth. And in an effort to reduce

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1 the number of RAIs, this proposed ISG would identify  
2 the information up front, so for the future  
3 applicants, what they should include in the LRAs, I  
4 guess, to make the staff review more efficient,  
5 information such as inspection results or analysis  
6 that would help the staff make the determination  
7 whether the containment would perform its intended  
8 function for the period of extended operation.

9 Past operating experience in the Mark I  
10 steel containments indicate that when water is  
11 discovered in the bottom outside area of the drywell  
12 shell, the most likely cause could be the water  
13 seeping through the inaccessible area.

14 And in slide 10 in your handout, I have a  
15 picture of the drywell shell. It is an inverted light  
16 bulb. That indicates where the inaccessible area  
17 would be.

18 And this area is the area for the distance  
19 between the drywell shell -- did you do slide 10?;  
20 that's a picture there; yes -- where the surrounding  
21 concrete structure is too small for successful  
22 performance of visual inspection. That's the area  
23 right there. The gap is usually two inches, three  
24 inches.

25 CHAIRMAN WALLIS: You used the term

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1 "seeping." It's really any water that gets there from  
2 any reason whatsoever.

3 MS. TRAN: Correct.

4 CHAIRMAN WALLIS: And "seeping" is used as  
5 a general term.

6 MS. TRAN: Term, correct.

7 CHAIRMAN WALLIS: It may not seep. It may  
8 actually flow or --

9 MS. TRAN: Flow through, right.

10 MR. ASHAR: The area that we are  
11 concentrating on is between the shell, between the  
12 shell and the concrete in the back, in between the  
13 insulation --

14 MEMBER BONACA: No, no, no.

15 MR. ASHAR: Oh, I'm sorry. Wrong place.

16 MS. TRAN: Right. That's --

17 MEMBER APOSTOLAKIS: It is between what  
18 and what?

19 MR. ASHAR: Between the freestanding steel  
20 containment --

21 MEMBER BONACA: Between the light bulb and  
22 the --

23 CHAIRMAN WALLIS: There's a space right  
24 there.

25 MR. ASHAR: And mostly it is filled with

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1 insulation.

2 MEMBER APOSTOLAKIS: How does the water  
3 get there?

4 MR. ASHAR: Water gets into -- I'm going  
5 to explain. There are three basic sources of water  
6 that we have seen so far in the operating history.  
7 One can be called because of the -- we don't have any  
8 picture of the actual area.

9 MS. TRAN: No. This is it.

10 MR. ASHAR: This is it. In this area,  
11 there are bellows, bellows between the driver.

12 CHAIRMAN WALLIS: We saw them this  
13 morning.

14 MR. ASHAR: Yesterday you may have seen  
15 it, yes. And those bellows can crack. And then they  
16 can give a seepage into the trough, which collects the  
17 water.

18 Now, if the drain, which is supposed to  
19 drain out all the water from there, is full or is not  
20 working properly, the water can accumulate in the  
21 trough area, which has been kept just for that  
22 purpose. And it may all flow in coming to this area  
23 here.

24 CHAIRMAN WALLIS: It's lower.

25 MR. ASHAR: Because it is not showing

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1 better this particular detail, this is not good  
2 enough. Yesterday it was a very nice picture here.

3 CHAIRMAN WALLIS: But in order to refuel,  
4 you have to flood the upper region there.

5 MR. ASHAR: That is correct.

6 CHAIRMAN WALLIS: And some of that water  
7 can get down on the outside.

8 MEMBER APOSTOLAKIS: Okay. Thank you.

9 MS. TRAN: Now, in this --

10 VICE CHAIRMAN SHACK: Now, is that the  
11 only source of the water, I mean?

12 MR. ASHAR: No, no. There are two or  
13 three we found so far. Okay? One is a cracking of  
14 bellows. Second one is there is a refueling seal  
15 between the bottom of the trough, concrete trough.  
16 And there is a systematic way of draining it out  
17 through a drainage. But drain gets clogged. And the  
18 water comes through that area. It collects in the  
19 trough again and goes into between the concrete and  
20 the drywell shed.

21 Clog one is the reactor cavity wall. You  
22 have a stainless steel liner on it. And stainless  
23 steel liner gets -- they may do for any reason. And  
24 the water goes directly from concrete into that gap in  
25 between the two.

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1                   These are three reasons we have identified  
2                   so far.

3                   CHAIRMAN WALLIS:   So what clogs this  
4                   drain?  You said the drain gets clogged?

5                   MR. ASHAR:  It is because of negligence on  
6                   the part of the various --

7                   CHAIRMAN WALLIS:  Yes.

8                   MR. ASHAR:  -- not to monitor them  
9                   correctly.  Now they have come to their senses.  And  
10                  they started telling us they are monitoring, they are  
11                  doing this, they are doing that.

12                  MEMBER BONACA:  The drains are down from  
13                  the sand cushions, right?

14                  MR. ASHAR:  They are separate.  After the  
15                  water leakage, it is the sand cushion area.  Then  
16                  there are drains to -- actually, those drains were  
17                  meant for making sure the scent does not go away.  And  
18                  if it is, then they can collect them and put them back  
19                  the same.  That was the whole idea behind it.

20                  But it has been used nowadays as a  
21                  water-collecting/catching kind of a thing.  It is an  
22                  indirect function of that particular drain, but that  
23                  shows that water is coming in.  If the drains into  
24                  that room, if it shows any kind of water in the Torus  
25                  room, then it shows that there is a water leakage from

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1            somewhere up above that is getting into that area.

2                    CHAIRMAN WALLIS:  It drains into the room  
3 around the Torus?  It just drips down the wall  
4 somehow?

5                    MEMBER SIEBER:  Yes.

6                    MR. ASHAR:  The water comes from here.

7                    CHAIRMAN WALLIS:  That is a four-inch  
8 drain pipe.  It just drains down the wall?

9                    MR. ASHAR:  This is a sand pocket here.

10                   CHAIRMAN WALLIS:  Where does it go to when  
11 it drains out of that four-inch drain pipe?

12                   MEMBER SIEBER:  Onto the floor.

13                   CHAIRMAN WALLIS:  It just drains onto the  
14 floor?

15                   MR. ASHAR:  Unless they are collectors.  
16 Some people have started collecting them into some  
17 kind of a jar.  But most of them, yes, it was going  
18 onto the floor.

19                   MS. TRAN:  It goes onto the floor, yes.

20                   MR. ASHAR:  There is where they find out.

21                   MEMBER BONACA:  Now, some licensees have  
22 the drainage and some don't.  That depends on the --

23                   MR. ASHAR:  Well, some licensees have  
24 drains of the sand pocket area here.

25                   MEMBER BONACA:  Down at the low point.

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1 MR. ASHAR: Some people have drains at  
2 this area somewhere on the top of it.

3 MEMBER SIEBER: I think all of them --

4 MR. ASHAR: And if it is on the top of it,  
5 then there has to be sealing between --

6 MEMBER SIEBER: All of them have the top.

7 MR. ASHAR: -- the concrete and the --  
8 yesterday we saw in the Monticello case, it was a  
9 seal, which was a galvanized steel shield between the  
10 sand pocket area and the above area. So it prevents  
11 the water from getting in.

12 MEMBER BONACA: The had a few ounces of  
13 water, too, at some point.

14 MR. ASHAR: Yes, yes.

15 MEMBER BONACA: So they must have come  
16 also from the top.

17 MR. ASHAR: In the case of Monticello,  
18 there were no signs like that. We did not see.

19 MEMBER BONACA: There were only a few  
20 ounces of water, they said.

21 MEMBER MAYNARD: Yes, but they speculated  
22 that that water had actually come from another source  
23 because of the two or three-inch sand pipe there.

24 MEMBER BONACA: On the sand pipe there,  
25 yes.

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1 MR. ASHAR: They could explain when you  
2 ask that question.

3 CHAIRMAN WALLIS: Well, if it drains down  
4 that four-inch drain pipe, I would assume that the  
5 sand is full of water.

6 MEMBER SIEBER: Yes.

7 MEMBER MAYNARD: Right. That is not the  
8 low point.

9 CHAIRMAN WALLIS: There is a lot of water  
10 there before it drains down the pipe. The sand  
11 pocket, the sand --

12 MR. ASHAR: The sand pocket has to be  
13 sucked up completely.

14 CHAIRMAN WALLIS: The sand cushion is  
15 saturated with water first.

16 MR. ASHAR: Right.

17 MEMBER SIEBER: A number of plants have  
18 drains at the bottom of the sand --

19 MR. ASHAR: At the bottom --

20 MEMBER SIEBER: It would make more sense  
21 to --

22 MR. ASHAR: Some people have at the bottom  
23 of the sand pocket area drains with -- again,  
24 actually, it is to retain the sand inside. So that  
25 all flowing sand can be collected, but if they can use

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1 it at the --

2 MEMBER SIEBER: What is the purpose of the  
3 sand in the first place?

4 MR. ASHAR: Okay. See, this is the --

5 MEMBER SIEBER: Got a cushion?

6 MR. ASHAR: -- concrete area -- okay? --  
7 here. And this one when the shell expands under  
8 pressure --

9 MEMBER SIEBER: It is room to --

10 MR. ASHAR: -- it gives you some room to  
11 budge in.

12 MEMBER SIEBER: Expand? Okay. But the  
13 whole bottom of the shell sits on concrete? So you  
14 don't worry about corrosion below the sand?

15 MR. ASHAR: We do in some cases. We do to  
16 some extent, yes. If --

17 MEMBER SIEBER: How do you address that?  
18 You can't get to it because the top of it is concrete,  
19 too.

20 MR. ASHAR: If there is an appreciable  
21 collection of water in the sand bucket area, there is  
22 a chance that the water might have gone between the  
23 steel shell and the concrete.

24 MEMBER SIEBER: Right.

25 MR. ASHAR: But those cases, we have not

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1 found many so far except one, one case.

2 MEMBER SIEBER: You probably don't know --

3 MR. ASHAR: Yes, sir.

4 MEMBER SIEBER: -- you've got a concrete  
5 pad, a hemispherical pad, and then concrete above  
6 that.

7 MR. ASHAR: Right.

8 MEMBER SIEBER: And so there's no way to  
9 make a measurement.

10 MR. ASHAR: We know.

11 MS. TRAN: The interior.

12 MEMBER SIEBER: You can't get to the  
13 inside unless you cut the concrete out.

14 MR. ASHAR: Unless you cut the concrete or  
15 there are some new methods that have been developed in  
16 the NRC's research program, which have guided matters,  
17 but they are not yet being calibrated and haven't been  
18 used extensively by anybody.

19 So there are potential uses for those  
20 things under these examinations, but we have not seen  
21 them use it so far. We have just put one report from  
22 Oak Ridge National Lab in e-mail items so that people  
23 can look at that report and see if it is applicable  
24 for them.

25 CHAIRMAN WALLIS: Didn't someone yesterday

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1 say they actually made holes in that concrete in order  
2 to inspect?

3 MR. ASHAR: Yes.

4 MS. TRAN: Monticello.

5 MEMBER SIEBER: Next to the pedestal.

6 MR. ASHAR: Yes. They had to do that.

7 MEMBER SIEBER: But that is about as far  
8 as you can go because --

9 MR. ASHAR: That is as far as you can go  
10 right now, right.

11 MEMBER SIEBER: It's really thick in  
12 between.

13 MR. ASHAR: Yes. You can go up to here in  
14 the sand pocket area. Anything below that, if there  
15 is a --

16 MEMBER SIEBER: Of course, the sump is in  
17 there, too.

18 VICE CHAIRMAN SHACK: But typically,  
19 though, I mean, your experience is that there is no  
20 water there or that they all collect water?

21 MR. ASHAR: Typically the water has been  
22 very little. There has been water except in one case  
23 in the case of, I think it is, Dresden III, when they  
24 had to put firewater in here to extinguish a fire in  
25 the gravel area here --

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1 VICE CHAIRMAN SHACK: Well, that would do  
2 it.

3 MR. ASHAR: -- because of a summation  
4 fire. I don't know why.

5 MEMBER SIEBER: Good place to get a fire.

6 MR. ASHAR: But there was a fire there.  
7 They put a lot of water into it. And this whole area  
8 becomes soft here in the sand --

9 CHAIRMAN WALLIS: I'm interested to see  
10 when the sand gets full of water by some mechanism how  
11 it ever gets out. How does it ever get dry?

12 MR. ASHAR: With sand you --

13 CHAIRMAN WALLIS: If you had water access,  
14 suppose the bellows fails --

15 MR. ASHAR: Except the temperature --

16 CHAIRMAN WALLIS: -- water runs down.

17 MEMBER SIEBER: Aren't there drains at the  
18 bottom of this thing pushing it, right?

19 MR. ASHAR: Some have. This one is not  
20 shown here. There is a drain right here.

21 CHAIRMAN WALLIS: There is a drain there?

22 MR. ASHAR: There is a drain.

23 MEMBER SIEBER: Okay.

24 CHAIRMAN WALLIS: So that is how you draw  
25 out the sand? You just let it soak out?

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1 MEMBER SIEBER: It drips into where the --

2 MR. ASHAR: The temperature in the drywell  
3 in general in that area is close to about 130-140  
4 degrees. So it helps a little bit drying --

5 CHAIRMAN WALLIS: It evaporates the water?

6 MR. ASHAR: To some extent, not -- I mean,  
7 I have been given those explanations by various  
8 applicants, I know, what does this, but I do not  
9 believe everything they say. But --

10 CHAIRMAN WALLIS: Okay.

11 MS. TRAN: Slide five, please.

12 MEMBER SIEBER: You say the space between  
13 the concrete and the shell and the drywell is filled  
14 with insulation.

15 MR. ASHAR: Yes, there is insulation in  
16 there.

17 MEMBER SIEBER: What is it, some kind of  
18 fiber of some sort?

19 MR. ASHAR: I think so, yes. In one case  
20 we found that insulation was bad enough that it has  
21 chloride and all those contaminants. So when the  
22 water came in, it came with contaminated water. And  
23 that started accelerating the corrosion rate.

24 MEMBER SIEBER: That would do it. The  
25 insulation holds the water all up and down.

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1 MR. ASHAR: Up and down.

2 MR. GILLESPIE: Hans, I think it is  
3 important here that we're not talking in every case  
4 about any single containment.

5 MR. ASHAR: Right.

6 MR. GILLESPIE: What you have hit on is  
7 exactly what I tried to say in the beginning. The  
8 specific designs are so variant that we have really  
9 found out in doing these reviews that a Mark I  
10 containment is not a Mark I containment when you're  
11 looking at the drain details and the drain location.  
12 It's a function of the age, the AE. And, for example,  
13 Nine Mile actually put cameras up to ten-inch drains  
14 that they have and looked up in there, and it was  
15 dust.

16 And so before we assume that this thing is  
17 always full of water on everyone, there is a great  
18 variance between each unit. The design is different.  
19 And what licensees have done in the past to verify  
20 either the presence or absence of water is very  
21 different.

22 And so it's not like there is a universal  
23 answer to each one of these. Each one really is  
24 different.

25 VICE CHAIRMAN SHACK: Now, again, just on

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1 that, are all of the ones filled with insulation or  
2 are some of them actually air gaps?

3 MEMBER ARMIJO: I thought Monticello was  
4 an air gap based on yesterday's presentation.

5 MR. ASHAR: It is called air gap. I mean,  
6 in general, the terminology used is air gap.

7 VICE CHAIRMAN SHACK: But, I mean, is it  
8 typically filled with insulation?

9 MR. ASHAR: Typically it is a concrete  
10 General Electric design. It has the insulation in  
11 most cases. There might be a plant or two that may  
12 not have it available, but there might be some plants.

13 MEMBER SIEBER: You almost need it to be  
14 the form for pouring the concrete.

15 MR. ASHAR: Right, exactly.

16 MEMBER SIEBER: You need something in  
17 there to do that. Otherwise you don't have a gap at  
18 all. And one of the ways you get water down there is  
19 you have to take that refueling seal out after you  
20 refuel in order to put the drywell back together. And  
21 the process of doing that leaves a lip of water --

22 MR. ASHAR: Right.

23 MEMBER SIEBER: -- all around where the  
24 seal --

25 MR. ASHAR: Right.

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1 MEMBER SIEBER: -- used to be. It can  
2 only go down.

3 CHAIRMAN WALLIS: Now, we had a plant  
4 recently which had bulges in this realignment.

5 MR. ASHAR: I want to clarify two things.  
6 Okay?

7 CHAIRMAN WALLIS: It was Brunswick.

8 MR. ASHAR: There is a problem with the  
9 terminology. The first thing, when we talk about the  
10 drywell shell, it is a freestanding drywell steel  
11 shell. And when we talk about the liner, it is  
12 attached to concrete with some kind of anchorages.

13 And that is where we use the word "liner."  
14 But I have seen people using very loosely "drywell  
15 liner" here. It is not true. Okay? We are going to  
16 clarify the terminology in the next -- there is no --

17 MEMBER SIEBER: The one plant that has the  
18 liner, the shell, the structural member is the  
19 concrete, the subject of the code.

20 CHAIRMAN WALLIS: Yes, that's right.

21 MEMBER SIEBER: So you can tolerate some  
22 amount of corrosion as long as you --

23 CHAIRMAN WALLIS: So the liner just sits  
24 on the --

25 MEMBER SIEBER: -- maintain tightness.

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1 CHAIRMAN WALLIS: Okay. So the liner sits  
2 on the concrete, which is why it bulges.

3 MEMBER SIEBER: Just in that one plant.

4 CHAIRMAN WALLIS: This one is  
5 freestanding, this one.

6 MEMBER SIEBER: Yes.

7 MR. ASHAR: The one we are showing is a  
8 freestanding shell plus the liner.

9 MS. TRAN: Okay. Slide five. For some  
10 applications, just the information provided was  
11 included in the various sections of the LRA. And for  
12 other applications, the information was obtained to  
13 request for additional information.

14 As a result, the proposed ISG recommended  
15 that future applicants provide a plant-specific aging  
16 management program that would address the loss of  
17 material for the accessible area of the drywell shell.

18 So the recommendations that the applicant  
19 should be included in there, in the aging management  
20 program to develop a corrosion rate that is really  
21 inferred from past UT examination or establish a  
22 corrosion rate using representative samples in similar  
23 operating condition.

24 CHAIRMAN WALLIS: I would think the  
25 corrosion rate was so low that it would be difficult

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1 to measure. Really, you could say that it's less than  
2 a certain amount.

3 MS. TRAN: Less than, then. No minimum  
4 design.

5 CHAIRMAN WALLIS: That's good enough. You  
6 don't actually want them to determine what it is  
7 because you might be so low that you can't measure it.  
8 But if it's less than a certain amount, that would be  
9 acceptable, wouldn't it?

10 MR. ASHAR: In general, subsection IWE of  
11 the ASME code allows close to about ten percent  
12 allowance --

13 CHAIRMAN WALLIS: I know, but --

14 MR. ASHAR: -- some localized corrosion.

15 CHAIRMAN WALLIS: But if there is no water  
16 there, the corrosion rate may be essentially zero.

17 MS. TRAN: Correct.

18 CHAIRMAN WALLIS: And so establishing a  
19 zero thing is very difficult to do.

20 MEMBER SIEBER: Really, what you are  
21 trying to do is to determine how close you are to  
22 min wall.

23 MR. ASHAR: The min wall, right, minimum  
24 wall.

25 MEMBER SIEBER: And by plotting the

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1 reduction in thickness, you can determine when you are  
2 going to hit min wall. At that point you no longer  
3 meet the code for that pressure vessel.

4 VICE CHAIRMAN SHACK: How do I do this?  
5 Do I have to have multiple UT readings from that  
6 inaccessible portion of the shell? Can I demonstrate  
7 that mine is always dry?

8 MEMBER MAYNARD: You could develop a way  
9 that you had data from the --

10 MR. ASHAR: Two in the same location.

11 MEMBER MAYNARD: If an applicant comes in  
12 and they don't have previous data, I'm not sure how  
13 they develop a rate.

14 MS. TRAN: This is what we learned in  
15 putting this together. They will have one point at  
16 the beginning, you know, the design of the fabrication  
17 point. And then as a result of generic letter 87-05,  
18 most applicants, I mean, yes, have another data point.  
19 So when using that, they could develop some kind of --

20 VICE CHAIRMAN SHACK: Again, that is very  
21 specific. How many data points did they take when  
22 they made those UT measurements? How many locations?

23 MS. TRAN: Eighty-seven? Do you know?

24 MR. ASHAR: Yes. Generally in response to  
25 87-05, a number of -- now I have to say licensees, not

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1 applicants -- licensees have taken that kind of  
2 approach that they will look at four points in four  
3 sectors --

4 VICE CHAIRMAN SHACK: Four quadrants.

5 MR. ASHAR: -- because they don't remove  
6 the sand. They just have the sand. It's not like  
7 Oyster Creek. So what they do is they chip out the  
8 concrete in certain areas and then take the  
9 measurements and in response to 87-05.

10 And the second reading they take is two  
11 years or so after. That gives them a closer rate at  
12 the same location. It isn't delicate science that,  
13 hey, something is going on. Then they do more work.

14 VICE CHAIRMAN SHACK: Now, again, from  
15 Monticello, they don't seem to have maintained those  
16 as access ports.

17 MEMBER SIEBER: No.

18 MR. ASHAR: No, they don't. I mean, they  
19 can get to it if they have to, but they don't maintain  
20 them because they --

21 MEMBER SIEBER: That becomes another  
22 pocket for corrosion --

23 MR. ASHAR: Yes, right. It becomes --

24 MEMBER SIEBER: -- because there is  
25 moisture inside the containment.

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1 MR. ASHAR: Right.

2 MEMBER SIEBER: In the sump is actually  
3 that floor there. The sump is built into the floor.  
4 And so every loose water, amount of water, ends up in  
5 that space where the drywell liner and the concrete  
6 meet.

7 So they have to fill it up. They have to  
8 do something. Otherwise you would have a pocket of  
9 water sitting there.

10 CHAIRMAN WALLIS: I am still a little  
11 puzzled. I would think that the corrosion rate is so  
12 low that it's within the uncertainty in the ultrasound  
13 measurements.

14 MR. ASHAR: If it is low, they will report  
15 as low.

16 MS. TRAN: At least we will have --

17 MEMBER SIEBER: Carbon steel water and --

18 CHAIRMAN WALLIS: There's no water there.

19 MR. GILLESPIE: As it happens with real  
20 applicants, we're looking at corrosion rates like 17,  
21 18 ml a year in some cases.

22 CHAIRMAN WALLIS: There is water there.

23 MR. GILLESPIE: Well, yes. And people are  
24 seeing some evidence of corrosion. In another case,  
25 Nine Mile case, they did these measurements. And then

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1 they have a high-corrosion area on mild carbon steel  
2 at the water line in the Torus.

3 And what they did was they took that rate  
4 as a conservative estimate, where they know water is,  
5 and applied it to their liner and say, "Okay. We've  
6 got 38 years to go here."

7 And so people actually have come up with  
8 ways given these points and other representative  
9 carbon steel areas within their area that they do  
10 measure because they're in harsher environments and  
11 applied that as a representation to this in order to  
12 show that they could make it past the renewal period  
13 or at least until the next measurement that they might  
14 commit to take.

15 And so so far each licensee that we have  
16 had an opportunity to both finish our review or  
17 interface with so far has actually been extremely  
18 consistent with this position. And so they have  
19 actually figured out how to do it.

20 And there is other carbon steel in the  
21 Torus, actually in a wet environment, which gives you  
22 a noticeable rate, as it happens, particularly where  
23 some of the liners have blistered and bubbled, which  
24 is a whole other issue, that they can apply to this.

25 It's a conservative application. You

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1 know, if it doesn't work, then they have to do  
2 something else to convince us that the rate is okay.

3 So when we talk the nebulous philosophy,  
4 it gets harder, but I think when you get to specific  
5 plant situations, pardon the pun, but it's concrete.  
6 And so they have kind of come up with ways to use the  
7 generic point, the generic letter issue points.

8 In fact, in Vermont Yankee's case, they  
9 actually had leakage and did extra measurements  
10 consistent with the ISP, which wasn't issued when they  
11 did this some years ago. And so they have preserved  
12 those extra points.

13 And so it just happens that these plants  
14 actually have this information sitting there. They  
15 just haven't used it in this application before. And  
16 this is clarifying. We expect you to use it in this  
17 application.

18 Go ahead, Linh.

19 MS. TRAN: I guess now where degradation  
20 has been identified in accessible area of the drywell,  
21 meaning in the interior area of the drywell, the  
22 applicant should provide an evaluation that would  
23 address the condition of the inaccessible area of a  
24 similar condition or find something in the interior  
25 area. They should have an evaluation for that.

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1 Now, to assure --

2 MEMBER APOSTOLAKIS: How does one do that?

3 MR. ASHAR: Let me. The actual, this is  
4 just what we have seen.

5 MEMBER APOSTOLAKIS: That's okay. You  
6 don't have to show it.

7 MR. ASHAR: Okay. This is the requirement  
8 we set in after when we endorsed IWE, IWL into  
9 50.55(a) in the rule, that if they find something in  
10 the accessible area, they ought to go and look in the  
11 surrounding inaccessible area to see if there is  
12 anything going on.

13 A lot of PWR licensees, for example, have  
14 found that at the junction of the steel liner of the  
15 concrete containment and the concrete floor, they have  
16 moisture barriers generally. And their moisture  
17 barrier gets damaged. The borated water many times go  
18 in. And it starts corroding the inside area. It  
19 shows up a little bit on the upper side.

20 So they would do examination and find out  
21 what is going on. And they find the moisture barrier  
22 could be the culprit. They have to change the  
23 culprit. They ought to go inside. They ought to take  
24 out the corrosion.

25 So that's the reason this problem has been

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1 in about the inaccessible. In accessible area you  
2 have corrosion. You would look into the joining  
3 inaccessible area to find every --

4 MEMBER APOSTOLAKIS: You will look into  
5 the inaccessible area. That helps make it accessible  
6 or not?

7 MR. ASHAR: No. If you see some rusting  
8 or something on the --

9 MEMBER APOSTOLAKIS: You can look at it.  
10 Why isn't it accessible?

11 MR. ASHAR: No, no. The whole area is  
12 that you see something in an accessible area. And  
13 they investigate as to what is going on underneath  
14 that particular area. The basic focus in the room was  
15 the PWR containments. That is where it was found in  
16 so many of them. And still we are finding it.

17 MEMBER ARMIJO: But it is possible you  
18 could have damage occurring in an inaccessible area  
19 and have nothing in the accessible.

20 MR. ASHAR: That's quite right.

21 MEMBER SIEBER: Possible.

22 MR. ASHAR: That is why this type of --

23 MEMBER ARMIJO: Very possible. I mean,  
24 it's --

25 MS. TRAN: That is why we use accessible

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1 area as the indication for the accessible area for the  
2 augmented inspection. They have to do visual in the  
3 surface. And then if the surface area is accessible  
4 only from one side and they have to protect the wall  
5 thing by using ultrasonic --

6 MEMBER ARMIJO: I don't worry about the  
7 accessible. I just worry about the inaccessible and  
8 having no way of knowing just by looking at the  
9 accessible area. It's not a good --

10 MR. ASHAR: That is where this ISG kicks  
11 in because this ISG is focused on inaccessible area.  
12 This is one of the pointers, that if there is  
13 something going on in the accessible area, which you  
14 can see right away, then there is something going on  
15 and you will look at it.

16 MEMBER ARMIJO: That is the easy part.

17 MR. ASHAR: The ISG concentration, focus  
18 of this ISG, is the inaccessible areas.

19 MEMBER APOSTOLAKIS: But how does one  
20 suspect?

21 CHAIRMAN WALLIS: Yes, that's right. How  
22 does one suspect?

23 MEMBER APOSTOLAKIS: How do you suspect?

24 MS. TRAN: You find water or leakage on  
25 your --

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1 MEMBER APOSTOLAKIS: That is getting back  
2 to what Dr. Armijo is saying. That's not our worry.  
3 What if you don't find water? You still make some  
4 problem in the inaccessible area. Is that correct?

5 MEMBER ARMIJO: Yes, you could.

6 MEMBER APOSTOLAKIS: So how does one  
7 suspect that something is going on in the inaccessible  
8 area?

9 MEMBER BONACA: No. She says water.

10 MS. TRAN: Water is one. If you find  
11 water in the drain lines, water in the drain line, in  
12 the --

13 MEMBER BONACA: For example, if the seals  
14 -- I guess you are focusing on the seals and on the  
15 bellows, right?

16 MR. ASHAR: Right.

17 MEMBER SIEBER: The only way you can get  
18 water into the inaccessible area is to have it flow  
19 through the accessible area. So if you make a  
20 measurement in the accessible area --

21 MEMBER APOSTOLAKIS: Okay. That is a  
22 different --

23 MEMBER SIEBER: -- that gives you some  
24 kind of justification to extrapolate to the area you  
25 get.

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1 MEMBER APOSTOLAKIS: But that doesn't help  
2 much because it could have run down --

3 VICE CHAIRMAN SHACK: The water runs down  
4 and collects at the --

5 MEMBER SIEBER: Right.

6 VICE CHAIRMAN SHACK: It doesn't stay on  
7 the side of the --

8 MEMBER BONACA: That is why the real focus  
9 is the last bullet. And that's what they attempted to  
10 do, you know, to put in the seals and the bellows in  
11 the scope of license renewal. And this has been kind  
12 of debated with the industry.

13 CHAIRMAN WALLIS: This is a very weak  
14 statement, "if moisture is suspected." That's a very  
15 subjective --

16 MS. TRAN: Or detected.

17 CHAIRMAN WALLIS: If you have a suspicious  
18 nature, you would suspect it all the time.

19 MR. ASHAR: Subsection IWE in its  
20 IWE-1240, there's a number of items. This is the  
21 abbreviated form. A number of places where this could  
22 occur is very vividly described in there, IWE-1240 in  
23 the ASME code. And that is what we are invoking, but  
24 we did not write everything that is written in the  
25 IWE-1240.

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1 MEMBER APOSTOLAKIS: Now, you are really  
2 including SSCs that are identified as source of  
3 moisture and scope, source of moisture?

4 MR. ASHAR: Yes. For example, cracking of  
5 bellows.

6 MEMBER SIEBER: The refueling seal.

7 MR. ASHAR: I explained to you earlier.

8 MEMBER APOSTOLAKIS: Okay. That's what --

9 MS. TRAN: The refueling seal is not.

10 MR. ASHAR: Refueling seal.

11 MS. TRAN: So they have to put that in the  
12 scope of license renewal.

13 MR. ASHAR: This is what we are --

14 MEMBER APOSTOLAKIS: Okay.

15 CHAIRMAN WALLIS: Why don't they just  
16 require that they check the bellows for cracks  
17 routinely?

18 MR. ASHAR: It is not very easy to get to  
19 it. They can do tests. That's what they do most --

20 MEMBER SIEBER: It not the only place it  
21 can leak.

22 MR. ASHAR: Yes. And I say --

23 MEMBER SIEBER: They can leak along the  
24 edge.

25 MR. ASHAR: Yes. And this is what we want

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1 to have them in the scope of license renewal, so they  
2 maintain them in a condition where it is not leaking.

3 MEMBER MAYNARD: Well, by "suspected"  
4 here, don't you really mean if there has been some  
5 previous evidence that moisture has been there? You  
6 know, I suspect. I have a hard time dealing with what  
7 I might suspect, but I can deal with whether I have  
8 had any indications or evidence.

9 MS. TRAN: Yes. This is "suspect" or  
10 "detected" through your drain lines.

11 CHAIRMAN WALLIS: Well, if moisture is  
12 detected, now, that makes sense.

13 MEMBER MAYNARD: Yes.

14 MS. TRAN: It should be "detected,"  
15 instead of "suspected."

16 VICE CHAIRMAN SHACK: So if moisture has  
17 been detected any time in the life of this plant up  
18 until license renewal included? Is that what it says?

19 MEMBER APOSTOLAKIS: It is not really  
20 detected. Go ahead. You answered my question.

21 CHAIRMAN WALLIS: Well, just take out the  
22 "if" clause and say, "include."

23 VICE CHAIRMAN SHACK: Yes. Why not just  
24 include them?

25 MEMBER APOSTOLAKIS: I think "suspected"

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1 is broader because would that include a situation  
2 where you have seen moisture or water in a similar  
3 facility and you suspect it may happen in yours, even  
4 though you hadn't seen it? "Suspected" is broader.

5 MEMBER MAYNARD: Well, yes, but I think  
6 from a regulatory standpoint and from dealing with  
7 licensees, I think you need a little bit better  
8 definition rather than it just being somebody's  
9 opinion sitting there saying, "Well, I suspect there  
10 might be something there."

11 CHAIRMAN WALLIS: Suspected by whom?  
12 Inspector or is it --

13 MEMBER MAYNARD: Well, I like the  
14 "detected" or --

15 MS. TRAN: Detected. I think --

16 MEMBER BONACA: We had a discussion  
17 yesterday at Monticello that shows how difficult the  
18 issue is. I mean, we rely very much on subjective  
19 judgments and say, "Well, we don't think we ever had  
20 water."

21 CHAIRMAN WALLIS: You could simply say  
22 that "The ACRS suspects that there may always be water  
23 there. Therefore."

24 MEMBER APOSTOLAKIS: You guys must have  
25 had a hell of a meeting yesterday.

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1 VICE CHAIRMAN SHACK: In Monticello's  
2 case, they see no evidence of corrosion in '87, which  
3 was a fairly substantial operating period for them.

4 MEMBER APOSTOLAKIS: That's right.

5 MS. TRAN: Identified.

6 MEMBER ARMIJO: If they have good records,  
7 they have a good sound --

8 VICE CHAIRMAN SHACK: One data point.

9 MR. ASHAR: We have to draw things --

10 MEMBER ARMIJO: They don't have to do it.

11 MS. TRAN: So just to get back on --

12 CHAIRMAN WALLIS: You really fixed this  
13 up.

14 VICE CHAIRMAN SHACK: Why not just put  
15 these seals in scope and be done with it?

16 MR. ASHAR: This is what we tried to do  
17 earlier. And there is so much resistance from a  
18 number of applicants. I mean, I had to go to three or  
19 four RAIs over and above a lot of teleconferences to  
20 convince them to put this in the scope of license  
21 renewal. And so many people denied.

22 CHAIRMAN WALLIS: So now you have to  
23 convince them to suspect something?

24 MR. ASHAR: No. Now, with this ISG, if  
25 they have suspected sites, areas, then --

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1 CHAIRMAN WALLIS: But they don't want to  
2 do it anyway. They'll never suspect anything.

3 MEMBER APOSTOLAKIS: No. Presumably there  
4 will be some guidance what suspicion means.

5 MR. ASHAR: There is a guidance.

6 MEMBER APOSTOLAKIS: Yes.

7 MR. ASHAR: There is.

8 CHAIRMAN WALLIS: There must be.

9 MEMBER APOSTOLAKIS: It just doesn't say  
10 it in bullets.

11 MS. TRAN: Yes.

12 MR. ASHAR: I was looking for IWE-1240  
13 here. I don't have one.

14 CHAIRMAN WALLIS: Okay.

15 MR. ASHAR: But that is where it is fully  
16 described as to -- this is what we are invoking here  
17 basically.

18 CHAIRMAN WALLIS: You want to say  
19 something, "if there are indications of moisture" or  
20 something like that.

21 MR. KUO: If I may, Part 54 rule in the  
22 rule language in the SOC discussed this, saying if a  
23 component is in an environment that could have aging  
24 effect, say in the operating experience, anywhere in  
25 the industry or your specific plant, that there is

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1 such a degradation mechanism, degradation mechanism  
2 that could cause an aging effect, then an aging  
3 management program should be provided. That's what  
4 the Part 54 rule requires.

5 In other words, if this is a possible  
6 aging effect from the operating experience, then that  
7 is suspected. You would use the word "suspect." That  
8 happened before. We should not talk about the  
9 hypothetical aging effect, but it is an aging effect  
10 that we have seen before.

11 VICE CHAIRMAN SHACK: Right. That is why  
12 I can't understand why you can't just put the seals in  
13 scope. I mean, it's not a hypothetical event.

14 MR. KUO: Like Hans said, some people  
15 don't want to include the seal in the scope.

16 CHAIRMAN WALLIS: There are often people  
17 who don't want to do things, but you can say, "Do it."

18 MEMBER BONACA: What you want and what you  
19 get are two different things.

20 MR. GILLESPIE: I think you will find as  
21 a result of this ISG, fundamentally seals are in  
22 scope. Remember, seals and the refueling stuff are  
23 not safety basically. And so what we're doing is  
24 because of the effect of non-safety components on a  
25 safety component, we're bringing them into scope. So

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1 it's a bit indirect.

2 And so it shouldn't be a surprise that  
3 utilities don't want extra requirement on things that  
4 don't have any requirements on them now.

5 MEMBER BONACA: But, you know, one thing  
6 that we are learning from this license renewal process  
7 as we converge, it seems to me that the central issues  
8 are becoming the inaccessible or buried components  
9 that you can't look at, that you cannot measure. And  
10 that's natural because, I mean, these plants are going  
11 beyond some original design in certain components of  
12 the -- and I think that it is important that we focus  
13 on these inaccessible components and ask our  
14 questions, you know, how long can this live and what  
15 is the source of the problem. And here -- anyway --

16 MS. TRAN: Hans wanted me to read the  
17 IWE-1241, the examination surfaces, "Surface area for  
18 the typical location," "Typical location of such areas  
19 of those exposed to stand-in water, repeated wetting  
20 and drying, persistent leakage, and those with  
21 geometries that permit water accumulations,  
22 condensation, and biologicals attack." I mean, it is  
23 in the -- it tells the applicant the area.

24 Now, let's say if moisture is detected as  
25 suspected or identified --

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1 (Laughter.)

2 MS. TRAN: Now, we will agree that they  
3 found water. Okay? So they should include the  
4 component, the source of it, in the scope of license  
5 renewal. In addition, we need to identify the surface  
6 area.

7 Next slide. By implementing and  
8 augmenting inspection for the period of extended  
9 operation in accordance with the ASME section 11,  
10 subsection IWE and also for the examination shall be  
11 in accordance with section 11, subsection IWE-2500.  
12 And I did go over that a little bit earlier.

13 That means that surface area accessible  
14 from both sides should be visually examined and  
15 surface area that is only accessible from one side  
16 should be examined for wall thinning and using sonic  
17 thickness measurement method.

18 Now, after all of that, after all of the  
19 augmented inspection, the applicant should demonstrate  
20 that either corrosion is not occurring by performing  
21 those examinations or analysis to do analysis on the  
22 result or that corrosion is progressing so slowly that  
23 the age-related degradation will not jeopardize the  
24 intended function of the drywell to the period of  
25 extended operation.

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1 VICE CHAIRMAN SHACK: Just how thick is  
2 this light bulb again?

3 MR. ASHAR: The light bulb? It varies.  
4 From the top, it is thinner, very thin, right around  
5 half-inch to three-quarter-inch. As you go down near  
6 the knuckle area between the sphere and the upper  
7 part, it is spherical area. It is close to about .7,  
8 .6 inches. Then it again goes down up to six inches.  
9 And then at the bottom area is about one to one and a  
10 half inches in between the sand pocket area --

11 VICE CHAIRMAN SHACK: No. But, I mean,  
12 it's 17 ml a year.

13 MR. ASHAR: Oh, yes.

14 VICE CHAIRMAN SHACK: You're going to chew  
15 that at a pretty good clip.

16 MEMBER BONACA: If you find a hole in the  
17 liner, I mean, would you suspect some moisture there?  
18 I mean, what is --

19 CHAIRMAN WALLIS: Even my chassis of my  
20 car, which is soaked in salt, doesn't corrode at 17 ml  
21 per year, does it? It's really bad conditions if  
22 you've got --

23 MR. GILLESPIE: Yes. That actually is the  
24 two worst points that a particular --

25 CHAIRMAN WALLIS: Yes, very bad --

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1 MR. GILLESPIE: -- that they reported to  
2 us. What it does do, though, is say there is  
3 operating history out there in this utility  
4 environment, that we cannot take for granted that it  
5 can't happen.

6 CHAIRMAN WALLIS: Right.

7 MR. GILLESPIE: And that's the reason for  
8 the ISG. We are not going to make the assumption  
9 because we have operating history that says it's not  
10 necessarily a valid assumption in all cases that it's  
11 going to go slow. There has been evidence of this  
12 going faster than people would have originally  
13 anticipated in the designs.

14 MEMBER BONACA: But in some cases where we  
15 have questioned the bellows, particularly the seals,  
16 if you're in seals, then the answer is always, well,  
17 we have good drainage. So you are in a quandary. I  
18 mean, what leads you --

19 MR. ASHAR: There are a number of things  
20 that tells us. The first thing, the drains are not  
21 clogged any time in the past. The second thing,  
22 visual examinations performed in the areas, it was  
23 shown there are no telltale signs of water for a  
24 number of inspections there performed. Then they had  
25 to show us at the bottom in the drain line there was

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1 no water coming out anywhere.

2 So there are so many things that they  
3 would tell us before they convince us that there is  
4 nothing going on.

5 MR. GILLESPIE: Mario, I would also say  
6 that I think this came up in Monticello's case  
7 yesterday, --

8 MR. ASHAR: Right.

9 MR. GILLESPIE: -- where they didn't take  
10 credit for it, but they actually had a primer sprayed  
11 on the outside of the inaccessible area. And other  
12 licensees have different applications of codings on it  
13 also.

14 And so it's not one thing.

15 MEMBER BONACA: Yes, I know, but --

16 MR. GILLESPIE: Aging management is  
17 accumulation of codings, time of exposure, amount of  
18 water.

19 MEMBER BONACA: And the spray on the  
20 surface was 65 or 40 years ago practically, 1965. So,  
21 you know, right. I understand.

22 MR. GILLESPIE: But the environment is not  
23 such that there is anything in there to actually cause  
24 the paint to peel off either. So there's no one issue  
25 here.

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1 MEMBER BONACA: Yes. I understand.

2 MR. GILLESPIE: It's different pieces to  
3 try to give you reasonable assurance.

4 MEMBER BONACA: In fact, yesterday at the  
5 end of the conversation, it was the lady who was  
6 performing the inspections felt confident with that.  
7 I'm sure that if you go physically and look at it and  
8 get information, you know, you can build a credible  
9 case that there is no concern with moisture. So I  
10 accepted that yesterday.

11 MEMBER ARMIJO: But a case has to be made  
12 --

13 MEMBER BONACA: Yes, it does.

14 MEMBER ARMIJO: -- with documented data,  
15 not just --

16 MEMBER BONACA: Right.

17 MEMBER MAYNARD: Is there something that  
18 is done periodically to ensure that these drains are  
19 really open, like particularly the sand point drains  
20 and stuff, that they're not plugged in some way?

21 MR. ASHAR: Now they are committing to  
22 those things. They have ensured those things, yes.

23 VICE CHAIRMAN SHACK: You'll find out when  
24 you have a leak.

25 MEMBER SIEBER: A sand pocket drain is a

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1 four-inch pipe. So they're hard to plug.

2 VICE CHAIRMAN SHACK: Yes.

3 MEMBER BONACA: I believe we have also  
4 some comments from the industry.

5 MS. TRAN: Right. Yes.

6 MEMBER BONACA: So shortly we'll get to  
7 those.

8 MS. TRAN: I am almost done. Now, if the  
9 intended function of the drywell cannot be met, the  
10 applicant can identify actions that will be taken as  
11 part of the aging management program to ensure that  
12 the integrity of the drywell would be maintained  
13 through the period of extended operation.

14 Last slide. Now, the drywell shell  
15 concern has already been addressed for the reactor's  
16 initial 40 years' licenses and relevant plants that  
17 have received a renewal license, as indicated in the  
18 left column there.

19 Now, the staff is in the process of  
20 reviewing the plants in the middle column. And the  
21 third column represented the remainder of the plants  
22 with the Mark I steel containment design.

23 Not all the plants in the third column,  
24 however, have announced their intention to renew their  
25 license, but the future review that's listed on the

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1 right side.

2 This concludes my presentation. So we can  
3 entertain any additional questions that you might  
4 have.

5 MEMBER BONACA: You don't have to request  
6 questions.

7 CHAIRMAN WALLIS: Ell, I suspect there  
8 might be some more questions.

9 (Laughter.)

10 MEMBER SIEBER: I don't know what they  
11 would be that we haven't already asked.

12 MEMBER BONACA: Any additional questions?

13 (No response.)

14 MEMBER BONACA: None. So we thank you for  
15 a very good presentation.

16 MS. TRAN: Thank you.

17 CHAIRMAN WALLIS: You have been here all  
18 day, Alex.

19 MR. MARRION: I know. Can I get one of  
20 those little name tag things? I'll just put it on.

21 (Laughter.)

22 MR. MARRION: Good afternoon. My name is  
23 Alex Marrion. I'm Senior Director of Engineering with  
24 NEI. And with me I have James Ross, who is the senior  
25 project manager with lead responsibility for license

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1 renewal. He's here to keep me out of trouble. He  
2 should have been here earlier.

3 I just want to make a couple of general  
4 comments. Based upon comments that the NRC made about  
5 the uniqueness of the specific plant designs, we feel  
6 that this is not really a generic issue, but it's  
7 appropriate to address it on a plant-specific basis in  
8 accordance with the uniqueness of the designs. And I  
9 think Frank Gillespie brought that up.

10 This is not a new issue. It's been  
11 addressed by the licensees in the past. There was a  
12 generic letter, 8705. And inspection requirements  
13 were incorporated into NRC regulations when NRC  
14 endorsed the ASME code subsection IWE as part of an  
15 update of 10 CFR 50.55(a).

16 Because that was already regulatory  
17 requirements, utilities were resisting the idea of  
18 imposing an additional regulatory requirement given  
19 that there wasn't sufficient evidence to indicate that  
20 the current requirement was not adequate if that makes  
21 sense.

22 The particular interim staff guidance is  
23 out for comment. Right now comments are due the 8th  
24 of June. We intend to submit comments on behalf of  
25 the industry.

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1           Most of the comments will be of a  
2 clarifying nature to make sure we understand the  
3 language, et cetera, which brings me to a more generic  
4 communication process issue. You know how I feel  
5 about generic communications based upon comments I  
6 made earlier.

7           The one thing that is not clear to us as  
8 an industry is why there is a need for an ISG process  
9 to begin with given that the NRC already has a  
10 well-established generic communication process that  
11 could be used as a vehicle for communicating staff  
12 guidance going forward.

13           So now we have generic communications.  
14 And we also have interim staff guidance, two separate  
15 processes that basically overlap. So we're going to  
16 continue making that point with every opportunity we  
17 have.

18           Lastly, I understand some question has  
19 been raised about the idea of continuing or the idea  
20 of imposing ultrasonic testing requirements. I want  
21 to make it clear that the current requirements that we  
22 currently have are for a graded approach to a visual  
23 examination.

24           And depending upon what you find, you do  
25 a more comprehensive examination, but the first step

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1 is a visual. And that's basic --

2 CHAIRMAN WALLIS: How do you visually  
3 inspect these inaccessible areas?

4 MR. MARRION: Well, as you heard from the  
5 staff, you do an examination of the inaccessible areas  
6 based upon what you find of the accessible areas if I  
7 have characterized it properly in what the staff was  
8 proposing.

9 And for the Mark I's, we intend to  
10 continue that process going forward. And we will be  
11 commenting accordingly on the ISG comments.

12 CHAIRMAN WALLIS: You have to be able to  
13 access some place which is relatively typical of the  
14 inaccessible places in order to do that.

15 MR. MARRION: Yes. I'm not familiar with  
16 the details of what that is, yes.

17 That's all I have, sir.

18 MEMBER ARMIJO: I just think that is  
19 fundamentally unsound because you have, really, a  
20 crevice condition in that sand pocket area. It's not  
21 at all represented by the accessible area.

22 And so looking at a safe location to make  
23 a judgment of a susceptible location seems to me a  
24 waste of time. I mean, if the accessible area is  
25 highly corroded, you can be sure that the inaccessible

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1 is in bad shape.

2 MR. MARRION: Right.

3 MEMBER ARMIJO: But the converse isn't  
4 true.

5 MEMBER APOSTOLAKIS: But didn't Jack say  
6 that for the water to get to the inaccessible area, it  
7 has to go through the accessible areas?

8 MEMBER ARMIJO: Yes, but it doesn't stay  
9 there.

10 VICE CHAIRMAN SHACK: It doesn't stay  
11 there.

12 MEMBER ARMIJO: It flows.

13 VICE CHAIRMAN SHACK: You have got a drain  
14 right at that thing. I mean, there is no way for  
15 water to really accumulate --

16 MEMBER APOSTOLAKIS: It is not  
17 accumulating.

18 VICE CHAIRMAN SHACK: -- in that  
19 accessible area.

20 CHAIRMAN WALLIS: But it gets to the sound  
21 --

22 MEMBER APOSTOLAKIS: But you are going to  
23 see some moisture or something.

24 MEMBER ARMIJO: You can make a case that  
25 if it's always been dry, that's your best case. You

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1 have good data.

2 MEMBER MAYNARD: I thought part of that,  
3 it would depend on what you include as a visual area  
4 for what you base -- if you're including the drains  
5 and if there is any moisture coming out of the sand  
6 drains or anything like that, well, that might be  
7 appropriate. But if you're saying that all you have  
8 to do is just visually look at the inside of the  
9 container there, that you don't have to do anything  
10 else.

11 But if you include as part of what you  
12 find visually results of drains and other things --

13 MR. MARRION: That is a comprehensive  
14 examination requirement that's in 50.55(a) right now.

15 Thank you. And I appreciate the time I  
16 spent with this illustrious body today.

17 (Laughter.)

18 MEMBER KRESS: We are honored to have you.

19 MEMBER BONACA: If there are no further  
20 questions, first of all, I want to thank the staff for  
21 their presentations and for the information. And then  
22 I'll turn the meeting back to you, Chairman.

23 CHAIRMAN WALLIS: Thank you very much.

24 We are finished with our formal  
25 presentations for the day.

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1 MEMBER KRESS: We don't have a letter on  
2 this particular issue?

3 MEMBER BONACA: No.

4 MEMBER KRESS: This was just a briefing?

5 CHAIRMAN WALLIS: Just a briefing. It was  
6 just a briefing.

7 MEMBER BONACA: There is no impact  
8 because, I mean, it was helpful because, again,  
9 yesterday we had a --

10 CHAIRMAN WALLIS: We don't need that --

11 MEMBER KRESS: Are we going to give some  
12 feedback now or anything on what we've heard or do you  
13 think the questions are sufficient?

14 VICE CHAIRMAN SHACK: The questions were  
15 sufficient.

16 CHAIRMAN WALLIS: Unless you have another  
17 point you want to make. Do you want to make some  
18 point?

19 MEMBER KRESS: Well, my point was that I  
20 just don't like this round-about way of doing things  
21 in the sense that I think there's a fatal flaw in  
22 trying to use the accessible areas to determine  
23 whether or not there is a problem in the inaccessible  
24 areas.

25 I would do what Bill Shack just said. Why

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1 not just include those sources of moisture within the  
2 scope?

3 VICE CHAIRMAN SHACK: Well, I think --

4 MEMBER KRESS: I know it has been resisted  
5 by the industry, but it doesn't seem like that big of  
6 a burden to me. I think that's the real solution.  
7 And that's what they're after, but they're trying to  
8 do it in a round-about way.

9 VICE CHAIRMAN SHACK: I also think a  
10 techie could come up with a way to measure those  
11 thicknesses.

12 MEMBER KRESS: Show me that way, and that  
13 may be okay. That's possible.

14 MEMBER SIEBER: Well, when you put the  
15 refueling seal in the scope, all you're doing is  
16 establishing an aging management program for that.  
17 That doesn't prevent leakage necessarily because there  
18 may be something other than the aging that causes the  
19 leaking.

20 MEMBER KRESS: Okay. Maybe. Maybe I am  
21 flawed.

22 MEMBER SIEBER: You could twist it, and  
23 now it leaks.

24 CHAIRMAN WALLIS: You should probably  
25 inspect a more susceptible area, which is a sand

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1 pocket.

2 MEMBER SIEBER: I think you have to deal  
3 with the --

4 MEMBER BONACA: In the past we left it to  
5 the --

6 MEMBER SIEBER: -- rather than deal with  
7 something that is removed from it.

8 MEMBER BONACA: In the past we left it to  
9 a licensee to have a choice. For example, in Browns  
10 Ferry, the staff was asking for inspection of the  
11 seals. They fought that. We left them open, either  
12 that or UT the liner in the vulnerable locations. And  
13 they chose to UT the liners.

14 The burden is inaccessibility because  
15 there is going to be that every ten years. And when  
16 they do the ISR, they are in containment. And they  
17 physically can then perform most of the utilities in  
18 those locations. So we left open those possibilities.

19 I take your point, and I think the  
20 Committee should decide. Should we have a comment on  
21 this or -- the intent wasn't one of providing a  
22 letter. This was an informational presentation, but  
23 --

24 CHAIRMAN WALLIS: I think the staff has  
25 heard our comments. It was a preliminary sort of

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1 thing. And that is probably good enough for now.

2 MR. GILLESPIE: We appreciate the comments  
3 because, as Mario said, underground cabling, piping,  
4 and this kind of large passive component are really  
5 becoming kind of the end point. Everything else we  
6 know how to deal with for the most part.

7 But I will say in this case -- and let me  
8 take Browns Ferry. You might say, well, why did  
9 Browns Ferry choose UT versus the seals. Browns Ferry  
10 actually had unidentified sources of leakage. And he  
11 said versus trying to identify every source of leakage  
12 because they didn't know where it was that their  
13 cheapest way out was actually to do the UT.

14 But they got the idea that we wanted to  
15 wait. And you had to assure us this thing was going  
16 to be okay relative to thickness.

17 VICE CHAIRMAN SHACK: That sand pocket is  
18 pretty big. I mean, you can have a fair amount of  
19 moisture in there that you're never going to see  
20 coming out of those drains. And, yet, you could have  
21 attack over a reasonable fraction of that.

22 MEMBER SIEBER: There are oodles of  
23 surface in there for the moisture to collect on.

24 MR. GILLESPIE: But, again, the locations  
25 of the drains are plant-specific. Some plants have

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1 seals, as Monticello had over it. Some places have a  
2 liner or coding on the other side of the surface.

3 VICE CHAIRMAN SHACK: Well, a bottom drain  
4 would give me a whole lot more comfort than that top  
5 drain would.

6 MR. GILLESPIE: Yes. The other thing is  
7 the sand is very compacted.

8 MEMBER KRESS: Have you ever tried to  
9 drain moisture out of the sand from the bottom? It  
10 doesn't come out.

11 MR. GILLESPIE: I don't want to pooh-pooh  
12 it, but the idea that this is a 130-degree area also  
13 --

14 VICE CHAIRMAN SHACK: You drive it out  
15 with --

16 MR. GILLESPIE: And so you're going to  
17 drive it out. And so you've actually got the occasion  
18 to get water in there about 20 days every 18 months or  
19 24 months depending on the fuel cycle someone is on  
20 and how long it's flooded. And that's why we've  
21 started to key into visual. You might say, visual  
22 leakage from someplace kicks you into needing to do a  
23 UT.

24 Now, what this inter-staff guidance  
25 position does do is says the identification of

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1 moisture, basically leakage, is equivalent to the  
2 visual recognition of accelerated corrosion on the  
3 inside. And that's an important distinction, which  
4 never existed before.

5 So for the inaccessible areas, we're using  
6 the indirect indication of seeing water as kind of an  
7 assumption that you have to do the same thing as if  
8 you saw accelerated corrosion on the inside. That  
9 gets us a measurement on an event basis.

10 And so someone who is sworn to keeping  
11 this thing dry, if they have an event during a  
12 refueling where they get leakage in there, now they're  
13 obligated to do something which is a bit more onerous  
14 and reestablish their rate.

15 It's not perfect. By the way, there are  
16 two inaccessible areas. We should be clear on that.  
17 There is the inaccessible area in the air gap. And  
18 then there's this inaccessible area that's layered on  
19 the bottom between the two concrete layers, which is  
20 really probably the most difficult area, but it was  
21 designed to last 40 years. It is totally lined with  
22 concrete. And then you've got this temperature  
23 gradient.

24 CHAIRMAN WALLIS: Is 40 years good enough  
25 with license renewal, though?

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1 MR. GILLESPIE: Now, it was originally  
2 designed for 40 years, but that was kind of an  
3 assignment. But now if you have no evidence of in  
4 leakage or water in there, I mean, again, it's  
5 indirect stuff. It's almost like a circumstantial  
6 case we're acting --

7 CHAIRMAN WALLIS: Concrete is not dry all  
8 the time.

9 MR. GILLESPIE: Concrete is porous  
10 material, and it is not dry all the time. And so then  
11 you could ask questions. A fair question in the aging  
12 management program is, what are you doing about  
13 groundwater? And do we have any evidence of  
14 groundwater?

15 We asked that from Nine Mile. And I think  
16 we're coming. I signed up the draft SE this morning.  
17 So I think next month we're probably coming on Nine  
18 Mile. They have actually got alarms on their drains  
19 if moisture is detected.

20 So every plant is doing some unique  
21 things.

22 CHAIRMAN WALLIS: Moisture can come out of  
23 the concrete. There is a lot of concrete. There is  
24 a late curing of the concrete which goes on for a long  
25 time. Then it can be damp. It doesn't have to be

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1 very damp --

2 MR. GILLESPIE: Right.

3 CHAIRMAN WALLIS: -- to produce some  
4 chemical reaction.

5 MR. GILLESPIE: What is the impact? This  
6 is what I don't know, is what is the impact of this  
7 temperature gradient.

8 CHAIRMAN WALLIS: You don't have oxygen.  
9 So that is probably what protects you.

10 MR. GILLESPIE: And so there is a number  
11 of things that -- we're doing our best, appreciate the  
12 Committee's comments, and more than happy. If anyone  
13 else has any better ideas, we would love to have them,  
14 but this ISG was an effort to send a benchmark for  
15 basically the best-performing plant on liners.

16 It has no moisture. What if you get  
17 moisture? How do you establish your rate? This is  
18 kind of putting out, in essence, that they now know we  
19 do expect a rate to even be established. We didn't  
20 have that in writing before.

21 CHAIRMAN WALLIS: We won't comment on it,  
22 and we hope it works out.

23 MR. GILLESPIE: Well, feel free to comment  
24 on it. We're happy to have comments. NEI is going to  
25 feel free to comment on it.

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1 CHAIRMAN WALLIS: We won't.

2 MEMBER BONACA: Certainly we will comment  
3 on individual applications.

4 MR. GILLESPIE: Yes. I do think this is  
5 middle ground we are wrestling with here because I do  
6 agree with Alex that the individual designs that we're  
7 applying this concept to are significantly different.  
8 In critical questions, like locations of drains, some  
9 are going to be more susceptible than others.

10 As I said, Browns Ferry said we have  
11 unidentified leakage. We know we have leakage. It's  
12 not a lot. UT is our answer. It's the only way that  
13 could give us positive confirmation.

14 CHAIRMAN WALLIS: Have they been having  
15 leakage on their reactor which has been shut down for  
16 all that period of time, unidentified leakage?

17 MR. GILLESPIE: Well, remember, we license  
18 units I, II, and III. The floor wasn't flooded on 1.  
19 So they haven't had any leakage on I for a long time.

20 CHAIRMAN WALLIS: They think they haven't.  
21 They could have an unidentified leakage.

22 MR. GILLESPIE: They had some unidentified  
23 leakage from refuelings in the other units, and they  
24 chose UT.

25 MEMBER SIEBER: They have them for fuel

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1 for --

2 MR. GILLESPIE: By the way, this is a very  
3 high-dose area, too. And so the question here isn't  
4 money.

5 MEMBER BONACA: Not only they. I mean --

6 MR. GILLESPIE: It's going to be dose.

7 MEMBER BONACA: Where the seals are, it's  
8 a very high red area.

9 MR. GILLESPIE: Yes.

10 MEMBER BONACA: Not down in the sand  
11 pocket.

12 MR. GILLESPIE: It depends on where you're  
13 at. You're directly under the vessel.

14 CHAIRMAN WALLIS: No one is going to go  
15 down there.

16 MR. GILLESPIE: My understanding from the  
17 licensees is from a radiological perspective, this is  
18 not an area you want to take lightly doing extra  
19 measurements over and above what you really need to  
20 confirm your --

21 CHAIRMAN WALLIS: BSBWR has hatches that  
22 you go in into the reactor pedestal area.

23 MEMBER BONACA: We were told by TVA that  
24 it is not a high red area because it is well below the  
25 --

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1                   MEMBER KRESS:  Graham, I was wondering if  
2                   the staff is considering a user need letter to  
3                   Research to try to develop a way to do this more  
4                   definitively, maybe strong on ultrasonics or  
5                   something.  Is there such a user need letter or any --

6                   VICE CHAIRMAN SHACK:  Well, there is  
7                   something from Oak Ridge now.

8                   MR. GILLESPIE:  Actually, there is a  
9                   letter report that just recently got put in ADAM from  
10                  Oak Ridge, from a project that Research sponsored, but  
11                  it is not commercially available yet.  And, as best I  
12                  understand it, it is a technique to calibrate for this  
13                  concrete steel concrete sandwich.

14                  I think, as I understand it, there are  
15                  three different alternative approaches to doing it.  
16                  And so the information is starting to be developed and  
17                  published.  But we're probably years away from actual  
18                  commercial application to go from the research bench  
19                  to the --

20                  MEMBER KRESS:  Yes, but you have got years  
21                  to go to do it in.  I mean, the corrosion rate is low  
22                  enough that --

23                  MR. GILLESPIE:  I am not disagreeing.  If  
24                  the Committee would like to -- we think we're actually  
25                  pretty close right now on a plant-by-plant basis.  But

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1 if the Committee would like to write a letter  
2 recommending a research project, it's okay. I don't  
3 mind. It's your Committee.

4 MEMBER SIEBER: The question is what do  
5 you want to cut out to pay for it.

6 MEMBER MAYNARD: I would like to just add  
7 on to Tom's previous comment just a little bit. It  
8 doesn't surprise me. And I would expect the industry  
9 to resist new requirements, new changes to things. I  
10 think it better to get the fight over, have it once,  
11 rather than a lot of times.

12 So, rather than dealing with a lot of  
13 things through staff guidance, generic letters, a lot  
14 of times it would be better if this is going to be a  
15 new expectation, new requirement, let's follow the  
16 process and make that -- you know, get the fight over  
17 with once, make it happen, rather than continually  
18 trying to go around these systems just generically.

19 MEMBER SIEBER: The requirement has always  
20 been there. And it stems from the code requirement.  
21 The question is, what do you do and how do you do it  
22 to give yourself a reasonable assurance that you're  
23 okay.

24 MR. GILLESPIE: The new aspect now is  
25 people having to articulate in an aging management

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1 program what they're going to do to ensure that their  
2 monitoring and measurement process for this liner will  
3 detect its approach to minimum wall thickness prior to  
4 it getting there.

5 I mean, that's really what plant license  
6 renewal is, to ensure that you have the additional  
7 monitoring programs in place that you will detect and  
8 correct prior to exceeding that minimum wall  
9 thickness.

10 The discussion of this ISG between us and  
11 the industry is evoked. I think it has now gotten us  
12 to a point where we have some actual cases under our  
13 belt that have now, you might say, set the standard  
14 for the next ones to come in.

15 And now we've got each plant evaluating  
16 itself against the plants we have already looked at  
17 and saying, "Am I like them? Am I different? If I'm  
18 different, then is it a positive difference or  
19 negative difference?"

20 And now we're starting to get those kind  
21 of aging management considerations into this piece of  
22 equipment, which we did not have, quite honestly,  
23 going in until we hit Browns Ferry.

24 The Committee wants -- Mario will remember  
25 this. I forget which BWR they were in. It was on the

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1 steam dryers. And I used the Committee. I quoted the  
2 Committee to the staff on the liner. And it was on  
3 the dryers.

4 And, Mario, I forget. You might have been  
5 the one who said it. You said it's large, it's  
6 passive, and you just wrote a generic letter saying  
7 it's safety. It wasn't in scope before that statement  
8 was made. It's now in scope. And, you know, the  
9 staff said it's large, it's passive, it has corrosion,  
10 and it's safety. And so now we're trying to take it  
11 on head on. I think with some success, you're seeing  
12 the applications getting it addressed at some level of  
13 credibility now.

14 MR. THADANI: Graham, I have one quick  
15 question.

16 Frank, you noted this is a high-dose area.  
17 This issue is one important in many ways, has I think  
18 rather minimal risk to public. How is that sort of  
19 balanced in terms of the actions called for and its  
20 relative importance?

21 MR. GILLESPIE: I think how we are trying  
22 to deal with that -- and we have got a meeting with  
23 one applicant day after tomorrow, Oyster Creek, on  
24 this, on our residual concerns after their RAIs. And,  
25 really, what we started talking about was the

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1       uncertainties involved in the decision.

2                   And so the question really is, how much  
3       should you pay for certainty in a decision? Because  
4       the significant measurement uncertainty and doing  
5       these UT exams, they're actually fairly coarse.

6                   There is uncertainty in primers and  
7       liners, which have exceeded, basically, the  
8       manufacturer-recommended lives of 10 to 15 years.  
9       Yet, they're still there. And they're still being  
10      inspected doing what they're doing.

11                  There is uncertainty in have you picked  
12      enough selected locations because we are looking for  
13      a general area degradation. We're not looking for  
14      just pitting.

15                  The Committee didn't mention it, but there  
16      are really two concerns. One is pressure retention  
17      and accident. And the other is buckling, the sheer  
18      collapsing of this thing under its own weight. And so  
19      you've got two reasons to inspect two different areas.

20                  And so I would suggest that in this ISG  
21      and what we're seeing from these utilities, we're  
22      actually accepting, you might say, a fair level of  
23      uncertainty in it to keep it rational.

24                  And so the safety consideration is in how  
25      much do we want to press people to make it more and

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1 more certain. And so that's really how we're  
2 factoring in the safety significance of it.

3 When I talk about dose and how many  
4 measurements need to be taken, we need reasonable  
5 assurance. And in many cases, there's not positive  
6 evidence on either side because this is a large  
7 passive thing that was put in there. It's expected to  
8 last forever fundamentally from the designer's point  
9 of view. We're confirming that assertion.

10 CHAIRMAN WALLIS: It probably will in most  
11 plants last.

12 MR. GILLESPIE: In most plants, I think it  
13 will. And so it's a confirmation. And so we're not  
14 designing the plant, which is very vigorous. We're  
15 confirming that the expected performance will be  
16 sustained. And we probably can be slightly less  
17 rigorous in the uncertainty we accept on that.

18 CHAIRMAN WALLIS: That is all the agency  
19 ever does. It doesn't design plants.

20 MR. GILLESPIE: Right.

21 CHAIRMAN WALLIS: It confirms performance.

22 MR. GILLESPIE: But you learn how much,  
23 what you're going to do in that confirmation.

24 MEMBER BONACA: Yes.

25 CHAIRMAN WALLIS: I think we may have gone

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1 over. We have gone over 15 minutes. I think it's  
2 about time we --

3 MEMBER BONACA: One last comment I had was  
4 that, you know, so many of the -- however the  
5 inspection processes we still depend on, for example,  
6 the visual inspection of this, we are still at the  
7 pace that really was conceived at the moment these  
8 plants are put in renewal. Okay? So every ten years  
9 they go in and look at it. Okay?

10 To me, you know, as these plants get older  
11 and older, these inaccessible areas, et cetera, you  
12 know, then maybe the frequency with which we're  
13 looking at it becomes more questionable because, you  
14 know, every ten years, a lot of things can happen.

15 CHAIRMAN WALLIS: Especially when you  
16 start to find things.

17 MR. GILLESPIE: We have occasions in  
18 several licensees where because they were sticking to  
19 a more extended inspection period, even when they had  
20 evidence of water, they did not consider evidence of  
21 water equivalent to accelerated corrosion visually.

22 So this ISG actually tries to take the  
23 principle you just espoused and says, "You can no  
24 longer in our expectation, staff's expectation, you  
25 can no longer ignore the presence of water. You have

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1 to now give us positive confirmation that the rate of  
2 degradation is still being minimized.

3 CHAIRMAN WALLIS: It is not boric acid.

4 MR. GILLESPIE: Yes, yes. At least we're  
5 dealing with a general moisture.

6 CHAIRMAN WALLIS: Right.

7 MR. GILLESPIE: And so this actually does  
8 go for that extended period to some incidents in which  
9 we actually have evidence from various licensees.  
10 They had evidence of water and basically did an  
11 engineering evaluation and did not obtain positive  
12 information if the thickness was okay.

13 MEMBER BONACA: What are you going to do  
14 when one of the already approved license renewals is  
15 going to come in for another license renewal?

16 MR. GILLESPIE: They have talked to us  
17 about that.

18 MEMBER BONACA: Well.

19 MR. GILLESPIE: I'm hoping to be retired  
20 by that point.

21 MEMBER BONACA: Anyway, I think we will  
22 see how this works.

23 MR. GILLESPIE: I started with the draft  
24 of the renewal rule in 1989 and have been doing this  
25 now for the last five years. At some point, someone

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1 else should do it.

2 MEMBER BONACA: All right.

3 MR. GILLESPIE: Thank you.

4 MEMBER BONACA: I give you back the  
5 meeting, Mr. Chairman.

6 CHAIRMAN WALLIS: We are ready to come off  
7 the record. Thank you very much for recording the  
8 meeting today, and we will take a break until a  
9 quarter to 5:00.

10 And when we come back, we will finish  
11 Mario's letter, which seems to be fairly  
12 straightforward. And then we will know where we are  
13 going with the other letter, hopefully know well  
14 enough that we can see our way to the end of it  
15 tomorrow.

16 (Whereupon, the foregoing matter was  
17 concluded at 4:34 p.m.)

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# Official Transcript of Proceedings

## NUCLEAR REGULATORY COMMISSION

Title: Advisory Committee on Reactor Safeguards  
533rd Meeting

Docket Number: (not applicable)

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS (ACRS)

533rd MEETING

+ + + + +

WEDNESDAY, MAY 31, 2006

+ + + + +

ROCKVILLE, MARYLAND

+ + + + +

The Subcommittee met in Room T2B1 at Two White Flint North, 11555 Rockville Pike, Rockville, Maryland, at 8:30 a.m., Graham B. Wallis, Subcommittee Chair, presiding.

MEMBERS PRESENT:

- GRAHAM B. WALLIS Chairman
- WILLIAM J. SHACK Vice Chairman
- GEORGE E. APOSTOLAKIS Member
- J. SAM ARMIJO Member
- MARIO V. BONACA Member
- RICHARD S. DENNING Member
- THOMAS S. KRESS Member
- OTTO L. MAYNARD Member
- JOHN D. SIEBER ACRS Member-At-Large
- JOHN LARKINS Designated Federal Official

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1       ACRS STAFF PRESENT:

2       HANS ASHAR                    NRR

3       DANIEL FRUMKIN                NRR

4       ALEX KLEIN                    NRR

5       THOMAS KOSHY                 EEEEB/DE/NRR

6       MICHAEL MAYFIELD             DE/NRR

7       GEORGE MORRIS                EEBE/DE/NRR

8       LINH TRANS                    NRR

9       GEORGE WILSON                NRR

10      ROBERT WOLFGANG             NRR

11      ROY WOODS                     RES

12

13      ALSO PRESENT:

14      HAROLD BARRETT               Duke Power Company

15      MIKE FALLON                  Constellation Energy

16      ALEX MARRION                 NEI

17      DAVID MISKIEWICZ             Progress Energy

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AGENDA ITEMS

PAGE

Opening Remarks, Chairman Graham B. Wallis . . . 4

Draft Final Generic Letter, "Post-Fire  
Safe-Shutdown Circuit Analysis  
Spurious Actuations" . . . . . 5

Draft Final Generic Letter 2006-XX,  
"Inaccessible or Underground Cable  
Failures that Disable Accident  
Mitigation Systems" . . . . . 149

Interim Staff Guidance on Aging Management  
Program for Inaccessible Areas of Boiling  
Water Reactor (BWR) Mark I Containment  
Drywall Shell . . . . . 195

Adjournment

## P R O C E E D I N G S

(8:31 a.m.)

CHAIRMAN WALLIS: The meeting will now come to order.

This is the first day of the 533rd meeting of the Advisory Committee on Reactor Safeguards. During today's meeting, the Committee will consider the following:

Draft Final Generic Letter, Post-Fire Safe-Shutdown Circuit Analysis Spurious Actuations, Draft Final General Letter, Inaccessible or Underground Cable Failures that Disable Accident Mitigation Systems, Interim Staff Guidance on Aging Management Program for Inaccessible Areas of Boiling Water Reactor Mark I Containment Drywell Shell, and Preparation of ACRS reports.

This meeting is being conducted in accordance with the provisions of the Federal Advisory Committee Act. Dr. John T. Larkins is the Designated Federal Official for the initial portion of the meeting.

We have received no written comments from members of the public regarding today's sessions. We have received a request from Alex Marrion, NEI, for time to make oral statements regarding the Generic

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1 Letter on Post-Fire Safe-Shutdown Circuit Analysis and  
2 the Generic Letter on Inaccessible or Underground  
3 Cable Failures that Disable Accident Mitigation  
4 Systems.

5 A transcript of portions of the meeting is  
6 being kept and it is requested that the speakers use  
7 one of the microphones, identify themselves, and speak  
8 with sufficient clarity and volume so that they can be  
9 readily heard.

10 I will begin with some items of current  
11 interest. In the items handed out to you, I notice  
12 that there is a speech by Commissioner Yatzko at the  
13 beginning. And at the end, there is an interesting  
14 article on various matters which complicate PWR sump  
15 evaluations.

16 Now in the middle of the day, we are going  
17 to have ethics training which is why the lunch break  
18 is so long today. And the ethics training is  
19 scheduled for between 12:15 and 1:30 so you should be  
20 here at 12:15 and ready to be trained in ethics.

21 That is the end of my prepared remarks.  
22 And I'd like to proceed with the meeting. Call on  
23 Rich Denning to get us started on the first item.

24 MEMBER DENNING: Thank you. We will be  
25 hearing from the staff regarding the draft final

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1 generic letter 2006-XX, Post-Fire Safety-Shutdown  
2 Circuit Analysis Spurious Actuations. The Committee  
3 will hear presentations by and hold discussion with  
4 representatives of the staff.

5 Additionally, Mr. Alex Marrion with NEI,  
6 has requested ten minutes to share NEI's perspective  
7 after the staff's presentation.

8 The Committee had requested to review the  
9 generic letter regarding Post-Fire Safe-Shutdown  
10 Circuit Analysis Spurious Actuations after the public  
11 comment period. We did not have a prior subcommittee  
12 meeting on this letter which may have been a mistake.

13 I have serious reservations about the  
14 balance between regulatory burden and approved safety  
15 associated with this letter. The letter leaves open  
16 options for risk informing this process but they are  
17 not easy activities to perform. So we are anxious to  
18 hear what the staff has to say on this. And to have  
19 a healthy discussion, I believe.

20 We have a considerable period of time  
21 actually to do this, three hours. But I think that we  
22 will want to look into this letter very carefully  
23 before giving our blessing.

24 I think we are now ready to hear from  
25 staff. And I'll turn it over to Alex Klein of the

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1 Office of Nuclear Reactor Regulation.

2 MR. KLEIN: Thank you very much. My name  
3 is Alex Klein. You see on the cover slide here my  
4 branch chief's name, Sunil Weekakkody. He extends his  
5 regrets for not being able to attend today's meeting  
6 in that he had a prior commitment for jury duty today.  
7 With that, I'm acting in his place so I will give the  
8 opening presentation.

9 The purpose of today's meeting and the  
10 presentation to the Committee is to present the final  
11 draft of Generic Letter 2006-XX, Post-Fire Safe-  
12 Shutdown Circuit Analysis Spurious Actuations. We are  
13 also here to obtain ACRS endorsement to issue the  
14 proposed generic letter.

15 I'd like to introduce the two primary  
16 staff members who will present today for NRR. To my  
17 left is Robert Wolfgang who is the primary author of  
18 the generic letter. And to my right is Daniel  
19 Frumkin, fire protection engineer, from the Office of  
20 NRR, who will speak to you about some of the NEI and  
21 EPRI fire testing.

22 We also have in the audience with us  
23 supporting staff members from NRR who were also  
24 instrumental in the development of this generic  
25 letter.

1           As an overview, I wanted to advise the  
2           Committee that there is a lot of history leading up to  
3           this generic letter. And you will hear some of this  
4           today. We did a bounding analysis, full of risk. We  
5           also did a regulatory analysis of the generic letter.  
6           But at this time, those slides are not in our  
7           presentation. But we are certainly prepared to  
8           discuss those aspects.

9           MEMBER DENNING: We absolutely would like  
10          to see those slides.

11          MR. KLEIN: Very good.

12          So the probability of spurious actuations  
13          due to fires will be presented by Dan Frumkin after I  
14          speak. And then after Dan speaks, we will receive a  
15          summary of the objectives of the generic letter by Bob  
16          Wolfgang.

17          Again, based upon the long history of this  
18          generic letter and so forth, there has been differing  
19          views between the industry and the NRC on the  
20          credibility of multiple spurious actuations. You will  
21          hear about the NEI/EPRI cable fire test results from  
22          Dan Frumkin, as I indicated.

23          I also wanted to indicate to the Committee  
24          that we are continuing with our inspections using  
25          risk-informed aspects. For example, RIS 2004-03,

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1 certainly one of the goals of issuing this generic  
2 letter is to reestablish compliance with the  
3 regulations.

4 That concludes my introductory remarks.  
5 And I'll hand over the presentation to Dan Frumkin.

6 CHAIRMAN WALLIS: When you present, could  
7 you make it clear to me just what it is you are asking  
8 industry to do because I had a lot of trouble figuring  
9 that out. There is a lot of sort of rather vague  
10 requirements it seems to me. And perhaps you can in  
11 your presentation make it clear just what it is they  
12 have to do.

13 MR. KLEIN: Yes.

14 MR. FRUMKIN: Good morning. My name is  
15 Dan Frumkin from the Office of NRR. I work for Sunil.  
16 And today I'm going to present some of the background  
17 from the NEI/EPRI testing that is discussed in the  
18 generic letter.

19 I see some new faces around the ACRS table  
20 so I'm going to pass around some tables from some  
21 testing that occurred. At the end of the cables that  
22 are fused together, you will be able to see two  
23 failure modes or examples of two failure modes. One  
24 is an inter-cable which is two cables -- or actually  
25 one is an intra-cable, which we use these terms intra

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1 within a single cable and inter between two separate  
2 cables. And this provides an example of both.

3 The highlighted portions within a cable  
4 are very close together that have failed together.  
5 And then we also have intruding cable that has  
6 penetrated the outer jacket and apparently the inner  
7 cable protection and come at least into very close  
8 contact which you can see.

9 We will talk also about the different  
10 types of cable. This is a thermal plastic cable,  
11 which is the more vulnerable cable, but as you can  
12 see, that it is subject to both failures from internal  
13 and external cables when put under the suitable heat  
14 or fire exposure.

15 So I'll be providing some background on  
16 the testing that provided the insight into the failure  
17 likelihoods, the objectives of that testing, some  
18 details of the testing, some of the test results, and  
19 a few conclusions based on the testing.

20 And then Mr. Wolfgang will be talking  
21 about the generic letter more specifically.

22 The NEI/EPRI testing was intended to  
23 address fire-induced circuit failure issues of concern  
24 to the NRC staff, principally the potential for  
25 spurious operations of equipment.

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1           This was intended to basically bring to  
2 close the question that the staff kept on bringing up  
3 that Browns Ferry had these and the industry said that  
4 well, it is very unlikely to occur. So this was  
5 intended to bring that to a close.

6           NRC witnessed the testing and also did  
7 some insulation resistant testing using Sandia  
8 National Laboratory resources.

9           And there are four documents that either  
10 in whole or in part document the results of some of  
11 the testing. The characterization of fire-induced  
12 circuit failures results is the big report from EPRI.

13           The circuit analysis failure modes and  
14 likelihood analysis is the Sandia Report of their  
15 insulation resistant testing.

16           These results were pulled into the NUREG  
17 6850, which is the fire protection re-quantification  
18 or the fire PRA methodology for nuclear power  
19 facilities. This is the state-of-the-art document  
20 that Research has developed to -- it is a handbook on  
21 how to do fire PRA.

22           And then there was the spurious actuation  
23 expert elicitation which was experts reviewing the  
24 testing and coming up with results.

25           The objectives, as I said, was to research

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1 the characteristics of fire-induced circuit failures  
2 to better understand these plants' responses to cable  
3 failures. And, as I said, the NRC also was involved  
4 in the testing and reviewed -- witnessed the testing  
5 and did their own insulation resistant testing.

6 So the details of the test, there were 18  
7 fire tests that were conducted between January 9th,  
8 2001 and June 1st, 2001 at the Omega Point  
9 Laboratories in San Antonio. And the three types of  
10 fire exposures were tested during the test. The hot  
11 gas layer region which is up at the ceiling level, the  
12 fire creates a buoyant plume and it fills the  
13 enclosure from the top down. And that is the hot gas  
14 layer.

15 Then below -- between the fire -- the  
16 actual fire and the hot gas layer is what we call the  
17 plume region where there is no flaming but that is a  
18 very hot part of the -- that is the hottest part of  
19 the smoke region of the fire.

20 And they also tested a radiant exposure  
21 where you get close to the fire itself or sometimes  
22 worst case could be up next to the plume region  
23 depending on emissivity of the smoke and the radiant  
24 energy coming off. If it is a clean burning flame, it  
25 may not have a high radiant energy but the smoke may

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1 be higher. So -- but they just used, I believe, a  
2 fixed radiant number but that is a little discussion  
3 of the radiant energy.

4 One thing that they didn't do that I will  
5 add is they did not put cables in the flaming region.  
6 That is why I have this highlighted. We, the staff,  
7 hear a lot from the licensees about how long it takes  
8 to have these cables fail. And that there is plenty  
9 of time in all situations for mitigation.

10 And based on the testing, yes, in a lot of  
11 the testing there was a lot of time before there was  
12 failure in, you know, 30, 40 minutes for some of the  
13 tests. But none of the tests tested this flaming  
14 region.

15 So this leaves the staff a very strong  
16 question of how fast -- well, first we don't know what  
17 failures will occur in that region. They could occur.  
18 They may not occur. We don't have the information.

19 It is very clear that if they do occur,  
20 they will occur much more quickly. The temperatures  
21 are over, you know, much -- a thousand degrees hotter  
22 in the flaming region. And there is also an ignition  
23 source. So it is a very different phenomenon. And  
24 cables could be exposed to a flaming region in the  
25 plant.

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1           So this test is not a complete picture of  
2           -- or let me just say that the timing factors that  
3           came out of the testing that was done are not a  
4           complete picture of the possible scenarios that could  
5           occur.

6           MEMBER APOSTOLAKIS: It appears that you  
7           were participating in the conduct of these tests. Did  
8           you express these concerns to EPRI when they were  
9           designing the tests?

10          MR. FRUMKIN: Well, I wasn't specifically  
11          involved in that. I don't believe that the test was  
12          intended to develop timing. And as such, it wouldn't  
13          have been an issue. The licensees or the industry has  
14          brought this timing issue and perhaps inappropriately  
15          based on the testing.

16          It is useful to heat this cable slowly  
17          because then the hot shorts would probably exist for  
18          a longer period of time. But whether this -- but my  
19          only point is that I don't believe that this testing  
20          provides a basis to say that hot shorts -- this test  
21          I don't think was intended or can provide a basis for  
22          timing. But I believe it is being applied or some  
23          intend to use it to show that there is a timing issue.

24          MEMBER APOSTOLAKIS: I would be such an  
25          obvious thing to do. I mean there must be a reason

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1 why they didn't do it. Do you know that? Or should  
2 we ask Mr. Marrion when he comes?

3 MR. FRUMKIN: Why they didn't do the  
4 flaming region? Yes, that is a fair question. But I  
5 believe the answer -- like I said, I do think that  
6 that was not -- if there hadn't been any failures  
7 outside of flaming region, I think there would have  
8 been a strong feeling that failures in the flaming  
9 region would have been maybe less likely. But it is  
10 a fair question.

11 MEMBER APOSTOLAKIS: Okay.

12 CHAIRMAN WALLIS: Does the material from  
13 which the insulation is made, does that actually burn  
14 at some temperature?

15 MR. FRUMKIN: Yes.

16 CHAIRMAN WALLIS: But if you stuck it in  
17 a flame, you would expect the insulation itself to  
18 catch fire.

19 MR. FRUMKIN: Yes. The ASTM -- or, I'm  
20 sorry, the IEEE 383 fire test that has been the  
21 standard fire test is actually a burning test. And it  
22 ignites the flames from the bottom in a vertical cable  
23 tray. And all the cables do catch on fire when  
24 exposed to flame. But some of them propagate more or  
25 less slowly.

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1           There are some specialized cables that  
2 don't catch on fire but those were not tested. Those  
3 aren't what we are talking about here.

4           So the results of the tests showed with  
5 some confidence that failures within multi-conductor  
6 cables are likely and when they do occur, they occur  
7 in multiple conductors within the same multiple  
8 conductor cable. So as you can see from that cable  
9 bundle, there may actually be more than one cable  
10 conductor within the cable further down the jacket  
11 that you can't see.

12           And then the way they are spiraled  
13 together in there so that various cables could come in  
14 contact with other cables within the same cable.  
15 Various conductors could come into contact with other  
16 conductors within the same cable.

17           In addition, multiple devices were shown  
18 -- the spurious actuation data showed that a single  
19 hot short within a multi-conductor cable usually  
20 effected actuation devices simultaneously. If there  
21 were two devices -- I believe the way they set this  
22 test up is they wanted a very practical approach.

23           So they actually put -- rather than doing  
24 similar to the Sandia testing where they used an  
25 insulation-resistance device, they used actual plant

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1 equipment, which they just plugged it in as they would  
2 in the plant and if it would actuate or not actuate.  
3 So it was a real pragmatic thing and they did actuate.  
4 And as the testing showed, some actuated  
5 simultaneously.

6 MEMBER MAYNARD: Did they also measure how  
7 long the signal stayed there? Or how long it  
8 actuated?

9 MR. FRUMKIN: Yes. And most of the hot  
10 shorts were of a short duration. And some were in the  
11 order of minutes, I believe.

12 This is a table of results of the best  
13 estimates given cable damage of a spurious actuation  
14 probability. And the purpose of this table is not to  
15 -- the purpose of this table is just to show that the  
16 NRC and the industry -- or at least the results from  
17 the EPRI report which was developed by industry, are  
18 very consistent.

19 The staff and the risk people in industry  
20 really are on the same page with the likelihood of  
21 spurious actuations. There are some factors of two  
22 here, differences, but in probabilistic and  
23 likelihoods, in that world it is a small difference.

24 CHAIRMAN WALLIS: This is strange to me.  
25 It must depend on the extent of the damage. I mean if

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1 you just burn a cable for a short time, nothing  
2 happens. If you burn it for long enough, you are  
3 going to get shorts. So you can't just have a  
4 probability. It is going to depend on the extent of  
5 the damage to the cable.

6 MR. FRUMKIN: Yes. In all these, cables  
7 were exposed to damage. So this is given that these  
8 cables were damaged.

9 CHAIRMAN WALLIS: But to what extent?

10 MEMBER APOSTOLAKIS: It is a critical  
11 probability. I mean -- or, as you said earlier --

12 PARTICIPANT: At some point the  
13 probability is one, right?

14 MEMBER APOSTOLAKIS: I mean there is a 0.6  
15 conditional probability that you will have a spurious  
16 actuation. This is conditional on the probability  
17 that the cable is damaged.

18 MR. FRUMKIN: Correct.

19 MEMBER APOSTOLAKIS: And what is that?

20 MR. FRUMKIN: That depends on the  
21 scenario. For example, if a cable is a foot above a  
22 piece of switch gear or let's say -- and this is not  
23 an unlikely situation -- a foot above 20 or 30 feet of  
24 switchgear. It runs across the cable tray, across the  
25 top of a number of pieces of switchgear, what is the

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1 probability?

2 Well, that could be calculated typically,  
3 I think, a single piece of switchgear is five times E  
4 to the minus five. Or, you know, in that range. But  
5 then it certainly would be damaged if there was even  
6 a small fire in that piece of switchgear.

7 So there is -- you could have cable -- and  
8 then that same cable does go through different areas  
9 where it could be exposed to different other fires.  
10 A single cable could go through three, four, five  
11 different areas and be exposed to a dozen different  
12 fire scenarios.

13 MEMBER DENNING: I think we have to  
14 recognize the context within which this is done,  
15 George. And I think it is important when we try to  
16 get into the question of risk informing this and that  
17 is basically we are doing a deterministic safe  
18 shutdown analysis in which you assume there is a fire  
19 in a zone -- in a fire area. And it can burn there  
20 for three hours. You know even though there are other  
21 mitigating things that would clear that, we assume it  
22 can burn for three hours.

23 So then the question is well, with this  
24 massive potential exposure, then you have got a cable  
25 running through there. What's the potential that it

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1 could then be heated up to a point at which you get  
2 this kind of interaction? You know it doesn't get at  
3 all into the questions of you have a fire in a room,  
4 what is the possibility that any cables are exposed,  
5 you know, before it is controlled.

6 MEMBER APOSTOLAKIS: But if we are doing  
7 a deterministic analysis, why are we calculated  
8 spurious actuation probabilities?

9 MEMBER DENNING: Well, let me give my view  
10 but I'd certainly like to hear your view, and that is  
11 that the question is not so much whether you can have  
12 spurious actuations but how many can you have? How  
13 many combinations of things can you deal with?

14 The industry has always agreed to looking  
15 at a spurious actuation on a one-at-a-time basis, you  
16 know. And so I think that what the staff is trying to  
17 do is to give the feeling that -- or their impression  
18 that this isn't the really rare event -- the extremely  
19 rare event that actually would have some kind of  
20 spurious actuation occurring.

21 And then I think by implication then maybe  
22 there is the potential for multiple spurious  
23 activations.

24 MEMBER APOSTOLAKIS: Well, the second  
25 bullet of the previous slide, I guess, is then the

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1 key, right? Is that what -- of devices?

2 MEMBER DENNING: Well, I would be curious.  
3 What is your -- if you were answering that question,  
4 how would you have answered George's question? Why  
5 are we looking at probabilities here now?

6 MR. FRUMKIN: Well, okay, maybe this slide  
7 was poorly planned. But the point of the slide is  
8 twofold. One is to say that with regard to  
9 probabilities, the staff and the industry people who  
10 do this work are on the same page.

11 And the second reason, I guess, is to show  
12 that these probabilities are very high in  
13 probabilistic space, that some of them are close --  
14 you know, 0.6, and then if you have a 0.6 scenario and  
15 you have two 0.6 scenarios, you've got a 0.36  
16 scenario. So that even multiple can be a fairly high  
17 probable.

18 MEMBER DENNING: Now help us though -- you  
19 can't say that without giving some conditionality of  
20 --

21 MR. FRUMKIN: Right.

22 MEMBER DENNING: -- 0.6 conditions on  
23 what?

24 MR. FRUMKIN: Cable damage.

25 MEMBER DENNING: Cable damage.

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1                   MEMBER ARMIJO: I have a problem with  
2 cable damage. Is this severe? Moderate? I have no  
3 feeling of -- I can see where all the insulation is  
4 burnt to a crisp and I would call that severe.  
5 Wouldn't these probabilities all be one?

6                   MR. FRUMKIN: No. Well, okay, so what  
7 this is talking about is the spurious actuation  
8 probability, not shorting situation. This is the  
9 likelihood of a hot short occurring within a cable  
10 without that cable shorting to its conduit or cable  
11 tray because generally once the hot conductors fail to  
12 the conduit or cable tray or the nearest ground, then  
13 they would certainly -- that would clear the spurious  
14 actuation.

15                  MEMBER MAYNARD: Okay. But I think there  
16 is a high probability if you make all the assumptions  
17 to get to this point. But you also have to factor in  
18 the probability of actually having a fire, for the  
19 fire going that long, for the operators not taking any  
20 action. There are a lot of other things getting up to  
21 that point that when you put it all in context --

22                  MEMBER APOSTOLAKIS: That is why I'm  
23 confused. We are either doing deterministic analysis  
24 or we are doing risk analysis. If we do risk  
25 analysis, then, of course, we have to do all this. If

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1 we do what Rich said, then it seems to me they are  
2 gone.

3 I mean you have three hours. Everybody is  
4 burning, right? I think as I recall from the early  
5 studies on this the real question is whether you will  
6 have a short -- a hot short first before an open  
7 circuit.

8 MR. FRUMKIN: Right. Before the short  
9 ground.

10 MEMBER APOSTOLAKIS: That is the critical  
11 thing.

12 MR. FRUMKIN: Yes.

13 MEMBER APOSTOLAKIS: And this is not  
14 answering that, is it?

15 MR. FRUMKIN: Yes, it is.

16 MEMBER APOSTOLAKIS: It is?

17 MR. FRUMKIN: This is the likelihood of  
18 that spurious actuation probability, not a short to  
19 ground.

20 MEMBER APOSTOLAKIS: Okay.

21 CHAIRMAN WALLIS: This is one spurious  
22 actuation.

23 MR. FRUMKIN: This is a single.

24 CHAIRMAN WALLIS: A single one although  
25 there are multiple wires in the cable?

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1 MR. FRUMKIN: Right. Well, this is a  
2 spurious actuation getting cable to damage within a  
3 cable or between -- there is an inter-cable factors  
4 here -- between two cables. So the point -- let's  
5 just say the 0.6 here is for within a single thermoset  
6 cable, the 0.2 or the 0.4, as the 6850 has it, is  
7 between -- or generally it is 0.3 is what has been  
8 used a lot -- is between two separate thermoset cables  
9 within the same tray.

10 And what the previous slide was trying to  
11 say is that within a single thermoset -- within a  
12 single multi-conductor cable, that more than one of  
13 the conductors are going to fail together with an 80  
14 percent likelihood. So it almost for sure that if  
15 let's say you have one hot conductor and four control  
16 conductors that could actuate four different pieces of  
17 equipment, that hot conductor will come into contact  
18 probably with all of them with the same likelihood,  
19 with this same 0.6.

20 CHAIRMAN WALLIS: Oh, with the same  
21 likelihood?

22 MR. FRUMKIN: Yes. It's not a 0.6 times  
23 0.6 times 0.6 in the same cable. Within that cable it  
24 is 0.6 times 0.8, if you will.

25 CHAIRMAN WALLIS: Okay.

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1 MR. FRUMKIN: So it is still -- it is  
2 almost 0.6.

3 MEMBER DENNING: Why are the inter-cable  
4 probabilities the same for thermal plastic and  
5 thermoset?

6 MR. FRUMKIN: Because -- oh, you mean this  
7 and this?

8 MEMBER DENNING: Yes.

9 MR. FRUMKIN: Inter-cable -- yes, I'm not  
10 -- that's just a -- well, intra-cable is very likely  
11 --

12 MEMBER DENNING: Intra-cable, I understand  
13 that.

14 MR. FRUMKIN: Yes, I don't -- I don't have  
15 --

16 CHAIRMAN WALLIS: What is the question,  
17 Rich?

18 MEMBER DENNING: It's thermoset is less  
19 likely -- one would think thermoset would be less  
20 likely to have inter-cable and perhaps they are the  
21 same here because there just haven't been any  
22 experiments done on a thermoset.

23 MR. FRUMKIN: I think that is it because  
24 you can see that that is one of the big differences,  
25 a factor of two here, and again the same factor of two

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1 for intra-cable -- inter-cable -- but yes, we're -- as  
2 Roy Woods is here, and we're doing more testing on  
3 this. But this is currently the state-of-the-art data  
4 on this.

5 And I can't explain the -- it's just that  
6 is what the data showed from the limited 18 tests.

7 CHAIRMAN WALLIS: Now we are talking about  
8 whether you are doing probabilistic or deterministic  
9 analysis. When we get to the generic letter, there  
10 are strange terms such as saying the licensee must  
11 assume the possibility of simultaneous multiple  
12 spurious actuation -- well that tells me nothing.

13 I'm assuming the possibility -- it says  
14 nothing about whether it is likely to be one or 0.6 or  
15 whatever.

16 MEMBER DENNING: What they are saying is  
17 one.

18 CHAIRMAN WALLIS: What does it mean?

19 MEMBER DENNING: It means one.

20 CHAIRMAN WALLIS: So possibility means a  
21 probability of one?

22 MEMBER DENNING: That's -- yes.

23 CHAIRMAN WALLIS: That wasn't clear to me  
24 at all. Okay.

25 MEMBER APOSTOLAKIS: We will come to the

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1 letter, I guess.

2 MEMBER DENNING: Yes. Continue.

3 MR. FRUMKIN: These are just some notes on  
4 the previous slide that some of the plants that use  
5 the CPTs, which are the control power transformers,  
6 that reduces the likelihood of spurious actuations.

7 MEMBER APOSTOLAKIS: All of these  
8 probabilities, of course, mean nothing now.

9 MR. FRUMKIN: Right, yes.

10 MEMBER APOSTOLAKIS: They are one.

11 MR. FRUMKIN: Okay. Well --

12 MEMBER DENNING: But we are going to get  
13 to risk informing at some point here.

14 MR. FRUMKIN: Absolutely. Right. So  
15 those were just notes on the previous slide which was  
16 unfortunately put in here.

17 In conclusion, a review of the test data  
18 readily illustrates that hot shorts often involve more  
19 than one conductor. And that concurrent hot shorts  
20 within a cable are probable and should be considered  
21 during circuit analysis.

22 That's the end of this presentation. And  
23 the point of this is just to lay the groundwork that  
24 simultaneous spurious actuations and simultaneous  
25 multiple spurious actuations have been shown by

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1 testing, by industry testing, to occur.

2 MEMBER DENNING: Now there is more testing  
3 that is in progress. It is your feeling that that  
4 testing could then -- will it be done within a time  
5 period where we add value to the licensee when the  
6 licensee is basically responding the generic letter?

7 MR. FRUMKIN: Yes, that testing is planned  
8 to be done by the end of the year. And that pool of  
9 data will be available -- certainly for risk-informed  
10 evaluations for the licensees to use. But the experts  
11 doing the testing don't believe that there is going to  
12 be -- they believe these numbers are going to be  
13 honed.

14 They believe that there are going to be  
15 more cable combinations tested here than in the 18  
16 EPRI tests -- EPRI/NEI tests. But they don't believe  
17 that for the information that was on that table are  
18 going to be changed by an order of magnitude. It's  
19 maybe a 50 percent change or something of that nature.

20 MEMBER DENNING: If we have time later on,  
21 could we have a short presentation by someone about  
22 what is still to happen? And what different  
23 configurations basically have been untested at this  
24 point that will be tested?

25 MR. FRUMKIN: Well, Roy Woods is sitting

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1 behind you. And I'm not sure if he is prepared to  
2 talk about this testing.

3 MEMBER DENNING: Let me say I'm not asking  
4 for you to do it right now. But do you think you  
5 could do it later?

6 MR. WOODS: Sure. Roy Woods, RES. Yes,  
7 certainly we can make a presentation to you whenever  
8 you want on the testing. The plans are well made. We  
9 are about to start within days or a week at most. It  
10 is actually about to happen.

11 MEMBER DENNING: Okay. Well, let's go  
12 ahead --

13 MR. FRUMKIN: I think they want something  
14 later this morning, right?

15 MEMBER DENNING: Yes, later this morning.  
16 Absolutely, yes. Later this morning.

17 MEMBER APOSTOLAKIS: That's what happens  
18 when you have three hours.

19 MEMBER DENNING: Right, yes. Thanks. Can  
20 you run any of those tests by eleven?

21 MR. WOLFGANG: My name is Bob Wolfgang.  
22 I'm a fire protection engineer in NRR. And I'm going  
23 to give you information on the draft generic letter  
24 Post-Fire Safe-Shutdown Circuit Analysis Spurious  
25 Actuations.

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1           A summary of the presentation, I'll go  
2 over the purpose of issuing the generic letter, the  
3 information we are requesting from licensees, the  
4 background on this issue since 1997, the basis for the  
5 generic letter, the issue that is clarified in the  
6 generic letter, public comments, and a summary at the  
7 end.

8           The purpose of issuing the generic letter  
9 is to clarify how the NEI/EPRI cable fire test program  
10 reaffirms long-held regulatory positions and provide  
11 part of a foundation for licensees who are planning to  
12 transition to NFPA 805.

13           Also, to respond to the Agency's need to  
14 provide clarification and closure of outstanding fire  
15 protection issues, respond to --

16           MEMBER APOSTOLAKIS: Excuse me. Are you  
17 going to come back to these? I mean this on slide 16,  
18 the foundation for licensees planning to transition,  
19 will you elaborate on these later? Or can you tell us  
20 a few words now?

21           MR. WOLFGANG: Well, that's --

22           MEMBER APOSTOLAKIS: Why is that relative  
23 to NFPA 805?

24           MR. WOLFGANG: This is just to show that  
25 multiple spurious actuations should be included in

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1 their risk analysis model.

2 MEMBER DENNING: Well, since George has  
3 raised the question, let me ask it now. And that is  
4 NFPA 805 is one of the ways -- transitioning to NFPA  
5 805 is one of the ways that a licensee can respond to  
6 this. Now my question is how long does it take to  
7 transition to NFPA 805?

8 And I don't quite understanding within the  
9 time periods of the 90 days and six months and this  
10 kind of stuff, within the context of a transition to  
11 NFPA 805, when did that transition actually have to  
12 occur for the licensee to be able to use that pathway?

13 MR. WOLFGANG: All they have to do is  
14 respond to us within I believe it is the 90 days.  
15 That they are transiting to NFPA 805. And they will  
16 take care of this situation during that process.

17 MEMBER DENNING: Then how long would they  
18 have to transition to NFPA 805?

19 MR. WOLFGANG: They have -- what is it?  
20 Is it three years?

21 PARTICIPANT: Three years.

22 MEMBER DENNING: Three years?

23 MEMBER APOSTOLAKIS: Yes, it is a long  
24 time.

25 MR. KLEIN: Let me describe briefly. This

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1 is Alex Klein. Let me briefly describe the process a  
2 licensee would use if he wants to transition to NFPA  
3 805. And that is once the licensee had made the  
4 determination that he does want to transition to 805  
5 because that is an option for him, if he submits a  
6 letter of intent to the agency indicating that that is  
7 what he wishes to do.

8 At that point, we review that letter and  
9 make a determination as to whether or not the schedule  
10 that the licensee has laid out is acceptable to the  
11 Agency. And what we have right now in place is a  
12 three-year time frame for licensees to transition with  
13 the option of extending that time frame if the  
14 licensee can provide us with sufficient justifications  
15 beyond the three-year time period.

16 Now within that three-year time period, a  
17 licensee would submit their letter of intend, do the  
18 act of transition into NFPA 805. And then before that  
19 three-year time period is over, we would submit their  
20 license amendment to the staff for our review and  
21 approval prior to them actually receiving the  
22 amendment.

23 MEMBER APOSTOLAKIS: It seems to me that  
24 the -- actually is the first bullet in the previous  
25 slide that is important because the licensee that

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1 wants to transition to NFPA 805 has to convince you,  
2 I think, that they complied with all the regulations,  
3 right? There may be a few exceptions, as I remember  
4 for a period of time, and all that.

5 So the primary reason seems to be to  
6 reaffirm long-held regulatory positions because  
7 somebody who wants to transition has to demonstrate  
8 that they complied with all that.

9 MR. KLEIN: That is correct. Really I  
10 think the primary purpose of the generic letter is  
11 that first bullet on that slide 16.

12 MEMBER APOSTOLAKIS: Right, right.

13 MR. KLEIN: Yes. As an added benefit, it  
14 does provide the foundation for licensees who want to  
15 transition to 805.

16 MEMBER DENNING: Now wait a second. I  
17 definitely did not understand this. I mean clearly  
18 there are a lot of licensees out there that did not --  
19 cannot respond to multiple spurious actuations. And  
20 they are not going to have to bring their plant into  
21 compliance with having to meet all the multiple  
22 spurious actuations before going to NFPA 805 because  
23 then NFPA 805 doesn't help them at all, right?

24 MR. FRUMKIN: Yes, that is correct. And  
25 what Dr. Apostolakis was saying is correct is that we

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1 have an enforcement discretion in place so those  
2 licensees who discover during transitions that they  
3 are not in compliance can do a risk analysis of that  
4 and determine that it is not red, that it is not  
5 wilful, that it is not a severity one violation.

6 And, therefore, they can comp it -- put  
7 compensatory actions in place and move forward towards  
8 transition without necessarily correcting that in  
9 accordance with the old fire protection program.

10 MEMBER DENNING: But one thing that I  
11 think is an issue though and that is suppose there is  
12 a plant out there that would really like to do the  
13 NFPA 805 approach but within the 90-day period, don't  
14 they have to go through the entire analysis and  
15 identify the SSCs that are potentially vulnerable  
16 based upon this detailed multiple spurious actuation  
17 evaluation which seems to me like an extremely  
18 difficult problem to undertake.

19 Is that true that they have to really  
20 analyze the whole system within 90 days according to  
21 this multiple spurious actuations and identify  
22 vulnerable SSCs? Am I correct or not correct?

23 MR. WOLFGANG: Well, they have to -- well,  
24 I'll get to that on a slide here.

25 MEMBER DENNING: Okay, if you will get to

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1 it, you can go ahead.

2 MEMBER MAYNARD: I would like to challenge  
3 that first statement just a little bit though. And I  
4 know that it has been a long-held position by members  
5 of the staff but as far as, you know, NRC position,  
6 there are a number of licenses that were issued and  
7 plants inspected and with their programs were approved  
8 and licensed without making this assumption.

9 And I'm not convinced that it has clearly  
10 been a recognized regulatory requirement. And again,  
11 I know licenses were issued, programs were reviewed  
12 without making -- otherwise, we wouldn't even be here  
13 today if those licenses weren't issued at that time.  
14 So I would challenge that. The first statement.

15 MR. WOLFGANG: We know SERs have been  
16 issued for Byron and Braidwood with a single spurious  
17 actuation per fire event. And we've come to the  
18 conclusion basically that was issued as a mistake.  
19 That was a mistake.

20 MEMBER MAYNARD: But I know that there are  
21 a lot of plants out there a license. Their analysis  
22 were reviewed, their programs were reviewed. I know  
23 I was personally involved with them back in the '80s  
24 when some of these issues were starting to come to a  
25 highlight. And I know that there are a number of

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1 plants out there with licenses that although it may  
2 not be documented as clearly, that it was known that  
3 multiple spurious actuations were not taken in account  
4 in that analysis.

5 I don't think it is clear that this is  
6 just confirming compliance to requirements that were  
7 in place. I think it is a different set of  
8 assumptions.

9 MR. FRUMKIN: Yes, and this may, I agree  
10 that your assumptions apply to probably a number of  
11 plants out there. But for the most part, Appendix R,  
12 10 CFR 50, Appendix R, Section 3(g)(ii) and 3(g)(ii)  
13 which is the alternate and dedicated shutdown are what  
14 is in question.

15 The NRC went in and did an analysis of the  
16 3(g)(iii) alternate shutdown. And for a lot of  
17 3(g)(iii) which is, for lack of a better description,  
18 a control room abandonment, they allowed the  
19 assumption of one spurious actuation. 3(g)(ii) wasn't  
20 across the board inspected in the 80s. It was assumed  
21 that licensees could wrap or protect or would have  
22 adequate separation.

23 And it wasn't evaluated for multiple  
24 spurious because generally the staff didn't believe  
25 that -- well, I'm not sure why they didn't do it. But

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1 the big question was this alternate shutdown.

2 And in the 90s, we had the thermal lag.

3 And a lot of that wrap was taken out. And a lot of  
4 manual actions or assumptions were put into place.

5 And I don't mean to say that there was -- well, the  
6 point that I am trying to make is that there was  
7 another change. There was the removal of a lot of  
8 these thermal lag which was relied on to protect  
9 cables and probably would have mitigated many spurious  
10 actuations, many multiple spurious.

11 MEMBER MAYNARD: And I'm not saying at  
12 this point that they shouldn't be considered now. I'm  
13 challenging the regulatory positions that says all  
14 along everybody should have always done this. I think  
15 that, you know, we're now setting, you know, these are  
16 the things that definitely need to be considered.

17 If those were considered 20, 30 years ago,  
18 if that was part of the regulatory position for the  
19 licenses, we wouldn't have gone through a 20-year  
20 period here of trying to figure out what it really  
21 requires the licensee to do. Again, it's a regulatory  
22 -- I believe that this is something that falls within  
23 the backfit.

24 It needs a better analysis overall. And  
25 that doesn't mean that it is a bad thing to do. I'm

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1 just saying that I do not believe that we can take the  
2 position that this is a requirement that has already  
3 been there, that everybody should have already done.  
4 And that is kind of what we are saying in this generic  
5 letter.

6 MR. KLEIN: This is Alex Klein of NRR. I  
7 just wanted to add to the discussion here that -- and  
8 Bob can clarify this also for me -- is that the  
9 generic letter did receive CRGR approval. We did go  
10 to that Committee.

11 There are subsequent slides in Bob's  
12 presentation, I think 23, 24, 25, that does talk  
13 about the background, the regulatory background that  
14 you are speaking of that might clarify some of these  
15 discussion questions.

16 MEMBER MAYNARD: I'd be glad to look at  
17 that.

18 MR. WOLFGANG: Well, and also attend CFR  
19 Part 50, Appendix R, it also talks about you have to  
20 consider hot shorts. It doesn't set a limit on the  
21 number.

22 MEMBER MAYNARD: Well, I understand that.  
23 But there is a number of the regulations that come to  
24 an agreement between the licensee and staff as to what  
25 are -- what do you have to assume in a number of those

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1 things.

2 So anyway, we will get into it maybe aq  
3 little more with the regulatory evaluation. But I do  
4 not agree that --

5 CHAIRMAN WALLIS: Well, could we clarify  
6 this first bullet? I mean it seems to me that if we  
7 did have this long-held regulatory position, which was  
8 being enforced, then you wouldn't need this generic  
9 letter.

10 MEMBER MAYNARD: Right.

11 CHAIRMAN WALLIS: So something has changed  
12 as the result of these tests. So maybe there was a  
13 position which wasn't very well enforced or something  
14 or was not properly interpreted by the industry. Is  
15 that the problem?

16 MEMBER MAYNARD: Or the staff?

17 CHAIRMAN WALLIS: Well, the staff, yes.

18 MR. FRUMKIN: Well, I think we -- well,  
19 Bob, I think I would say that something did change.  
20 And that thing may not have been entirely the tests.  
21 I think that the staff had high confidence that these  
22 fire barriers that were installed were separating  
23 these redundant trains.

24 And they were removed and they were  
25 replaced with non-barrier solutions which were

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1 analysis, manual actions, and those type of things.  
2 And as soon as the NRC started inspecting post-thermal  
3 lag fixes, which was in 1997, well before these tests.

4 We had numerous -- there was an information notice  
5 97-something which presented numerous hot short and  
6 multiple -- well, numerous alternate associated  
7 circuits and circuit failure type issues.

8 So to hang this entirely on the test is  
9 not -- certainly the staff position goes before -- to  
10 before the tests. And that has been documented in  
11 that generic -- that information notice and there was  
12 a letter sent to NEI which expressed this sentiment  
13 well before -- I believe that was before the test as  
14 well.

15 CHAIRMAN WALLIS: The purpose of the  
16 generic letter is to reinforcement your enforcement  
17 which you were a bit lax about before or something?  
18 Is that what its purpose is?

19 MR. WOLFGANG: There was a lot of  
20 confusion. You were talking about 3(g)(iii) about  
21 alternative and dedicated shutdown systems and the use  
22 of one only -- you had to consider one spurious  
23 actuation there --

24 MR. FRUMKIN: Right, 3(g)(iii) and the  
25 Generic Letter 86-10 talked about spurious actuations

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1 quite a bit but the staff position is that those  
2 didn't apply to 3(g)(ii) and they were erroneously  
3 applied to 3(g)(ii), which is all we're really talking  
4 about right now. We are not talking about these 3(g)  
5 (iii) inspections that occurred in the 80s. We're not  
6 talking about the 3(g)(iii) approvals.

7 Every 3(g)(iii) program should have been  
8 approved with an SER. That was the policy. But we  
9 did not go into the 3(g)(ii) areas because the  
10 barriers and those solutions should have been  
11 sufficient.

12 MEMBER MAYNARD: It just seems to me that  
13 with all the confusion that has gone on for a number  
14 of years on this, a much cleaner way of doing this is  
15 if the NRC believes that this is something that needs  
16 to be done is just to come out with it as a  
17 requirement following the process for rulemaking, for  
18 changes, or whatever rather than trying to handle it  
19 through a generic letter requesting information to  
20 show compliance with a very confusing set of  
21 requirements.

22 MEMBER-AT-LARGE SIEBER: I suspect,  
23 though, that the staff does not believe that  
24 rulemaking is required, that the proper regulations  
25 already exist.

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1 MR. FRUMKIN: That is correct.

2 MEMBER-AT-LARGE SIEBER: In the review  
3 process that the staff has used in the past does not  
4 establish new regulations. The regulations are the  
5 regulations. And how the staff reviews something is  
6 another matter.

7 MEMBER MAYNARD: Well, how they review it  
8 but what it is accepted as to your certain assumptions  
9 and things --

10 MEMBER DENNING: I'm sure we are going to  
11 come back to this issue. So why don't you go ahead --

12 MEMBER-AT-LARGE SIEBER: It won't go away.

13 MR. WOLFGANG: Okay, moving to the next  
14 slide, more purposes of issuing a generic letter,  
15 respond to the Agency's need to provide clarification  
16 and closure of outstanding fire protection issues,  
17 respond to the licensee's request to provide  
18 clarification of regulatory expectations, and respond  
19 to the region's request to provide clarification of  
20 regulatory expectations for circuit inspections. And  
21 circuit inspections were resumed January 2005.

22 Generic letter, what information it is  
23 requesting from the licensees. Within 90 days to  
24 evaluate their licensing basis and information in the  
25 generic letter regarding multiple spurious actuations

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1 in the Post-Fire Safe-Shutdown Circuit Analysis.

2 MEMBER MAYNARD: Is that practical to  
3 expect -- I think we might get into a little bit more  
4 as to what we are really asking here but within 90  
5 days, for the whole industry to do this, I'm sure  
6 there is going to be some resources -- external  
7 resources needed in some cases.

8 With the whole industry trying to use  
9 those, is 90 days really a practical time frame to get  
10 what is really being asked for here?

11 CHAIRMAN WALLIS: Well, we believe that it  
12 is. But, you know, I guess when NEI talks, they have  
13 a consensus from the industry that it is not a  
14 sufficient time, We can always adjust that.

15 MR. WOLFGANG: Yes, I think what is being  
16 asked here is not for the technical evaluation of the  
17 entire circuit analysis. What we are asking for is  
18 for licensees to report whether they have a multiple  
19 spurious licensing basis or they have a single  
20 spurious licensing basis.

21 For those plants that have a multiple  
22 spurious and haven't analyzed for multiple spurious,  
23 then that is going to be a long-term fix. All we are  
24 asking them to do is to report their situation within  
25 90 days, which is a licensing --

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1                   MEMBER DENNING: Wait a second. How do  
2 they submit their functionality assessment of effected  
3 SSCs without doing that total analysis? Am I missing  
4 something here? And this is within 90 days, if  
5 you're not in compliance, you have to submit this  
6 functionality assessment of effected SSCs.

7                   MEMBER APOSTOLAKIS: And compensatory  
8 measures.

9                   MEMBER DENNING: And compensatory  
10 measures. I think that is the whole analysis, isn't  
11 it? I mean you don't necessarily know how you are  
12 going to ultimately correct them but it seems to me  
13 that the analysis has to be done in 90 days.

14                   Incidentally, I should have mentioned that  
15 listening in is EPM, which is a company that does this  
16 kind of stuff. But I should have mentioned that  
17 earlier that we do have an open line here.

18                   I'm sorry, go ahead.

19                   MR. WOLFGANG: Yes, what we are asking --  
20 yes, to submit the functionality assessment of  
21 effected SSCs.

22                   MEMBER DENNING: Yes. How do you  
23 determine what SSCs are effected unless you have  
24 looked at the multiple spurious actuations.

25                   MR. WOLFGANG: Yes, they have to look at

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1 the multiple spurious actuations.

2 MR. FRUMKIN: First, I agree with the  
3 member that doing a full analysis for 104 plants in 90  
4 days is not going to be credible. This is a major  
5 effort to look at that.

6 I believe though that the second bullet of  
7 compensatory measures for these areas where the plants  
8 are capable of putting compensatory measures and then  
9 solving the problems in a long-term program. That is  
10 credible. That is possible.

11 MEMBER APOSTOLAKIS: It seems to me that  
12 the 90 days applies to the first bullet but not the  
13 sub bullets.

14 MEMBER MAYNARD: I think it does a -- it  
15 certainly applies to the first bullet.

16 MEMBER DENNING: But the sub bullets are  
17 there in the generic letter.

18 CHAIRMAN WALLIS: Well, why is there an  
19 assumption that they are not in compliance now? I  
20 mean that they have done various things today to meet  
21 the regulations already. And their position would  
22 probably be we are in compliance now. So what are you  
23 asking us to do?

24 MEMBER DENNING: No, I don't think so.

25 MEMBER-AT-LARGE SIEBER: Well, if you took

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1 the lag out of your plant --

2 CHAIRMAN WALLIS: That's the problem.  
3 They have changed something.

4 MEMBER-AT-LARGE SIEBER: You changed the  
5 configuration.

6 CHAIRMAN WALLIS: That is okay. So they  
7 have changed something. Thank you.

8 MEMBER DENNING: It is not just that,  
9 Graham. They have argued that this has not been the  
10 requirement. That you didn't have to do multiple  
11 spurious actuations. They did one at a time or a  
12 single. So they would argue this is not the  
13 regulatory -- they would argue that it is new  
14 requirement but kind of like Otto has.

15 MEMBER KRESS: But the regulation says  
16 broadly that under these conditions, you have to have  
17 one train of safe shutdown. And that can only be  
18 interpreted as multiple spurious actuation I think.

19 MEMBER MAYNARD: I don't think -- I don't  
20 agree with that. Through the regulatory process, you  
21 don't necessarily have to assume everything that  
22 anybody could ever conceivably come up with. And so  
23 that's why the NRC and the industry -- but you decide  
24 on a set of assumptions. And what you really have to  
25 assume to reasonably meet that requirement.

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1           And then as new information comes along,  
2           if those previous assumptions weren't conservative  
3           enough, you may need to do that. But that really  
4           constitutes a change there. Otherwise why would you  
5           have any guidance documents or any -- what is allowed  
6           to assume or whatever. So I would argue that it is  
7           part of it.

8           MEMBER DENNING: In some respect, this is  
9           an open-ended problem in terms of, you know, and so it  
10          begs for some kind of guidance as to where you end the  
11          search for things that can go wrong.

12          Continue.

13          MR. WOLFGANG: We are asking that within  
14          six months to submit the plan to return all effected  
15          SSCs to compliance with the regulatory requirements.  
16          And that is the plant modifications, license .  
17          Exemption request.

18          And we are also asking that within 30  
19          days, if you cannot meet the 90-day, six month  
20          schedule that we are requesting, you provide us  
21          notification you cannot meet it and your suggested  
22          schedule and completion date.

23          CHAIRMAN WALLIS: What kind of things  
24          would they do to come into compliance? Are they going  
25          to change these offending cables? Are they going to

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1 change the way in which they put out fires? Are they  
2 going to change the actual equipment in the SSC? It  
3 is very open ended what they are expected to do.

4 MR. WOLFGANG: Yes, they can protect  
5 cables. They can reroute cables. They can submit  
6 license amendments based on a risk analysis method --  
7 those type of things.

8 CHAIRMAN WALLIS: Manual actions?

9 MR. WOLFGANG: Well, not in 3(g)(ii)  
10 space. There are a lot of ways.

11 MEMBER DENNING: I don't know how  
12 expensive those ways are. I mean we say there are  
13 lots of ways but those ways may be extremely  
14 expensive.

15 CHAIRMAN WALLIS: Well, I'm also unclear  
16 about what it is they are supposed to assume can go  
17 wrong? When I read these things about they are  
18 supposed to assume the possibility that this can  
19 happen, it goes back to Otto's question here.

20 I mean if you assume the very worst that  
21 could possibly happen, then you could have enormous  
22 changes in the plants in order to avoid this worst  
23 conceivable thing. Is that what you are asking them  
24 to do?

25 MR. WOLFGANG: You have to assume all

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1 multiple spurious actuations.

2 CHAIRMAN WALLIS: Well, but that is a  
3 major thing, isn't it?

4 MEMBER MAYNARD: That is major.

5 CHAIRMAN WALLIS: You have to assume that  
6 it happens with the probability of one?

7 MR. WOLFGANG: Yes.

8 MEMBER-AT-LARGE SIEBER: Yes. On the  
9 other hand --

10 MR. WOLFGANG: 3(g)(ii) in deterministic  
11 space doesn't limit the number of --

12 MEMBER-AT-LARGE SIEBER: On the other  
13 hand, you restrict the fire to a single fire area,  
14 which means that if you have appropriate separation or  
15 fire barriers that you have a train that is free of  
16 fire, that will operate.

17 MR. WOLFGANG: Right.

18 MEMBER-AT-LARGE SIEBER: And that is the  
19 principle. I think it is going to vary dramatically  
20 from plant to plant, especially based on the age of  
21 the plant and the type of plant. I think some are  
22 going to be tremendously impacted. Some others may  
23 not. And again, depending on what assumptions you  
24 really have to make and what credit you can take for  
25 things you already have in place, things that have

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1 already been done, everything from operator actions to  
2 fire loadings, improvement in fire control,  
3 everything.

4 MEMBER DENNING: And, Jack, you talked  
5 about the separating of trains. And that's, you know,  
6 pretty straight forward. But isn't the real open  
7 endedness related to the spurious actuations where  
8 there is some unanticipated valve opens that effective  
9 give you a loss of coolant accident or something like  
10 that, that, you know, introduces a different element  
11 to safe shutdown. Isn't that the open-endedness that  
12 makes it so difficult.

13 And I also don't know whether -- how many  
14 plants really know what cables are in what trays  
15 within a room.

16 Obviously if you are going to do -- yes so  
17 that you basically are assuming anything within the  
18 room -- I mean you know that -- you have concluded  
19 that it has gone through a room up to this point.  
20 But, you know, they could be in totally different  
21 trays in the room. But you don't know where they are  
22 in the room.

23 CHAIRMAN WALLIS: Well, you have to assume  
24 that they are all together and they are all --

25 MEMBER DENNING: Assume that you have to

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1 submit it. But I don't know the answer to that.

2 MEMBER KRESS: Assume that you have to do  
3 it. But I don't know the answer to that.

4 MR. WOLFGANG: Well in a fire area in a  
5 room, if you assume a fire, you have to assume  
6 everything is --

7 MEMBER KRESS: Yes, but can everything  
8 have an inter --

9 CHAIRMAN WALLIS: Everything in that room  
10 can short together?

11 MEMBER KRESS: -- can it short together as  
12 an inter-cable connection even though it may be way  
13 separated?

14 MR. FRUMKIN: No, if it couldn't occur,  
15 then it wouldn't be -- I mean you wouldn't have -- we  
16 wouldn't be expecting energized cables to penetrate  
17 conduits. We wouldn't expect energized cables to jump  
18 from tray to tray.

19 Or, for example, DC current has to have  
20 the same path. If it is not in the same tray or same  
21 conduit you couldn't actuate that from an AC circuit  
22 or something of that nature.

23 MEMBER DENNING: I don't know whether --  
24 what utilities know what cables --

25 MR. FRUMKIN: Right, no, you are correct.

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1                   MEMBER DENNING: -- are in what trays you  
2 were going to run.

3                   MR. FRUMKIN: And that can be a very  
4 significant effort.

5                   One of the aspects is that for the  
6 3(g)(ii) area -- or for the 3(g)(iii) plants, some of  
7 the older plants are 3(g)(iii). And they don't have  
8 very much separation at all. But they have done a  
9 significant analysis that was reviewed in the 80s  
10 which we referred to earlier. And they do have the --  
11 because they have done that detailed analysis, they  
12 have the flexibility to do manual actions.

13                   So in effect, the newer plants with the  
14 good separation should be fairly well off. The older  
15 plants that had very little separation probably have  
16 done a lot of this analysis already and may already be  
17 in compliance.

18                   It is the middle plants that are more  
19 likely than the older plants to have the circuits  
20 traced. But they are kind of in the middle there.  
21 And they are the ones who I think are going to be  
22 having a more difficult time answering this generic  
23 letter.

24                   MEMBER-AT-LARGE SIEBER: That is a pretty  
25 limited number of plants then. This issue is, you

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1 know, I was a young man when this issue came out. The  
2 work has been done. And the plants that were built in  
3 the 80s, to my knowledge they all had pull tickets  
4 associated with cables when they were originally  
5 routed.

6 So you just run your computer and it tells  
7 you whether you've got separation or not. And if you  
8 don't, what circuits are offending circuits.

9 MR. FRUMKIN: Many plants have that. Or  
10 some plants have that.

11 MEMBER-AT-LARGE SIEBER: Some plants have  
12 it. Some plants had to do that all manually, hand  
13 over hand.

14 MR. FRUMKIN: But I just want to add one  
15 thing that the staff has come our with a statement --  
16 or, well, not really a statement but what 3(g)(ii)  
17 says is that when cables of the redundant trays are  
18 within the same fire area and are not protected, so if  
19 you have a area with train A equipment in it and no  
20 train B equipment or the train B is protected in  
21 accordance with 3(g)(iii) protection criteria, we're  
22 not -- so with the train B protected, we're not  
23 limiting the actions that -- the feasible and reliable  
24 actions for failures on train A.

25 So if you have a protected train outside

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1 of a fire area or protected with 3(g)(ii), the  
2 licensees can do feasible and reliable manual actions  
3 on the fire-effected train to let's say close that  
4 valve that opens spuriously or stop that pump that  
5 opens spuriously because there is a full -- typically  
6 from the control room, so there is good annunciation  
7 and indication, there is a full protected train  
8 outside of that fire-effected area.

9 And I'll just point to Alex and see if he  
10 nods at me. Okay, yes.

11 MEMBER-AT-LARGE SIEBER: And there is very  
12 limited amounts of equipment if you had a spurious  
13 actuation, would cause another accident like a LOCA.  
14 Some value opens in the valve is -- like a safety  
15 injection valve, is designed to pump in not pump out.

16 Okay, so there are check valves and things  
17 like that that would prevent that. But there area  
18 few cases -- PRVs for example --

19 MR. FRUMKIN: Yes, PRVs is one I was  
20 thinking of if you --

21 MEMBER-AT-LARGE SIEBER: Yes , that could  
22 open and --

23 CHAIRMAN WALLIS: New plant designs have  
24 this screw valves. And the spurious actuation of them  
25 create a LOCA.

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1 MEMBER-AT-LARGE SIEBER: Yes, but they  
2 have them so you get to a safer condition, right?

3 CHAIRMAN WALLIS: One question I was going  
4 to --

5 MEMBER-AT-LARGE SIEBER: It is just  
6 expensive to do it.

7 MEMBER DENNING: Yes, is there any kind of  
8 assessment as to what fraction of spurious actuations  
9 actually are deleterious as far as effecting safe  
10 shutdown capability? I mean has anybody in a risk  
11 study done that kind of an assessment? Or do you have  
12 any feeling as to the fraction of spurious actuations  
13 that will get you into trouble?

14 MR. FRUMKIN: Well, you asked for that.  
15 We have this bounding analysis that we did and you  
16 actually -- well, you have to look at a lot to find  
17 the ones that are going to give you problems from a  
18 spurious actuation standpoint. But in our bounding  
19 analysis, it took five pairs of spurious actuations in  
20 order to get a significant risk.

21 And it is because these spurious system --  
22 these multiple spurious effect systems that, you know,  
23 are the redundant train. So it effects both -- the  
24 train, the productive train or the unprotected train,  
25 and the redundant train so you really lose all your

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1 protection with these scenarios. And it doesn't --  
2 you have to look at a lot to find the bad players.  
3 And there don't actually have to be a lot of bad  
4 players, at least based on our bounding analysis for  
5 it to be of fairly high risk significance.

6 MEMBER DENNING: Continue please.

7 MR. WOLFGANG: Background since 1997,  
8 multiple LERs brought lack of consensus concerning  
9 circuits to the staff's attention. And this led to a  
10 moratorium on inspection of circuit issues back in  
11 1997.

12 In 2001, NEI/EPRI cable fire test  
13 demonstrated that multiple spurious actuations can  
14 occur. And they can occur in rapid succession or  
15 simultaneously without sufficient time for mitigation  
16 in between.

17 Therefore if a licensee doesn't account  
18 for multiple spurious actuations, and its circuits  
19 analysis, the licensee may not be in compliance with  
20 10 CFR 50.48 and 10 CFR Part 50, Appendix A, General  
21 Design Criteria, and (3) which require that a licensee  
22 provide and maintain free from fire damage, one train  
23 of systems necessary to achieve and maintain the safe  
24 shutdown.

25 Staff has developed the risk-informed

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1 approach to inspections to focus on risk-significant  
2 configurations based on the cable fire test. And this  
3 is RIS 2004-003.

4 MEMBER DENNING: Now let me ask with  
5 regard to that, I understand that that was prepared  
6 for inspection as opposed to compliance.

7 MR. WOLFGANG: Correct.

8 MEMBER DENNING: But is there a real  
9 reason why one couldn't use guidance of that type for  
10 compliance as well? Do you see a regulatory  
11 constraint that would prevent you from -- I mean from  
12 the regulations that exist now, do you think it would  
13 be incompatible for the staff to provide the  
14 equivalent, perhaps a perturbation off of that or  
15 perhaps a revision to NEI's risk-informed guidance?  
16 Why can't we do that?

17 MR. WOLFGANG: I think the thing is we  
18 haven't seen licensee's risk tools, their model that  
19 we would have to approve prior to them using any risk  
20 analysis.

21 MR. KLEIN: Let me take a shot at  
22 answering the question maybe at a higher level. And  
23 that is with respect to licensees who are required to  
24 meet the requirements of Appendix R. Don't today have  
25 the ability to change that regulation or the

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1 commitment to that regulation based upon risk  
2 information.

3 If they want to do that, they would have  
4 to seek an exemption request from us against the  
5 regulation. They may certainly use risk information if  
6 they want to come in and see us with an exemption  
7 request, that is certainly open to them.

8 But what I think Bob is indicating is that  
9 a licensee may not make a change in their plant using  
10 risk information and making the conclusion based upon  
11 their standard license condition that says that, you  
12 know, it doesn't effect their ability to achieve and  
13 maintain safe shutdown.

14 The staff has been telling licensees that  
15 we would like them to come in and see us for such an  
16 exemption request or a license amendment.

17 MEMBER DENNING: Yes, I understand that  
18 that is the way -- that is the process by which they  
19 would use risk information to do that. But this first  
20 bullet is generic. It is generic information as to  
21 how many combinations of things or what are kinds of  
22 situations that are -- could be expected to be risk  
23 significant?

24 Now I realize it is not totally complete  
25 but it, you know, it gave guidance to the inspectors

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1 as to what are the combinations of things that could  
2 risk significant to look at and make sure. And I  
3 don't see any reason why one couldn't effectively rule  
4 out some of this total space of situations that the  
5 applicant has to look at to be compliant.

6 Now, you know, Tom is saying -- and I  
7 think it is kind of the regulatory position that  
8 you've got to look at everything because anything that  
9 can prevent this safe shutdown pathway is a potential  
10 problem. But you used it for the inspector to give  
11 him guidance on what is risk important and not in the  
12 area.

13 Couldn't you have done the same to provide  
14 generic guidance on this is how far you have to go in  
15 this process of looking at multiple spurious  
16 actuations.

17 MR. FRUMKIN: Bob, let me -- I'll be  
18 candid. We tried very hard to read 3(g)(ii) as a --  
19 to be risk informed in the way you describe. And with  
20 help from our lawyers, we were unable to get there for  
21 those pre-`79 plants. And then there is also the  
22 Agency or the Commission has approved a risk-informed  
23 rule.

24 And although it is more comprehensive,  
25 that is out there. And we considered the possibility

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1 of a risk-informed changed to this rule, to the  
2 current 3(g)(ii), and there is currently a rule that  
3 has been promulgated by the Commission. So that did  
4 not seem like a credible approach.

5 CHAIRMAN WALLIS: Well, could I follow up  
6 on that? And I looked at this risk informed approach.  
7 It seems to be just advice on vendors --

8 MR. FRUMKIN: Yes?

9 CHAIRMAN WALLIS: -- to focus on certain  
10 configurations. Well, that's okay. Focus on what  
11 matters. But then how does this inspector decide to  
12 reach some sort of a finding that something is not  
13 adequate? Or is not in compliance. That would get  
14 closer to tying these things together because the  
15 whole question here is what do they have to do in  
16 order to be in compliance.

17 MR. FRUMKIN: That is correct.

18 CHAIRMAN WALLIS: And how does the  
19 inspector know when they are in compliance or not?  
20 Well, he has just chose to focus on these things. How  
21 does he then decide when he is focused whether or not  
22 they are in compliance?

23 MR. FRUMKIN: And the answer to that is  
24 they pull up the licensing basis and if the licensing  
25 basis, if they do not have -- are not licensed for

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1 single spurious, that are considered to be -- required  
2 to look for multiple spurious.

3 CHAIRMAN WALLIS: Well then what are they  
4 supposed to do?

5 MR. FRUMKIN: Then that would be -- that  
6 could be -- that would be a finding would be run  
7 through the risk analysis of this STP. It would be  
8 cited. And the licensee would have to resolve a  
9 finding in the normal manner.

10 MEMBER DENNING: Incidentally, I think  
11 your last statement about their legal interpretation  
12 of pre-`79 is very important as far as our  
13 considerations are concerned because I mean it could  
14 be indeed that we are in a box in terms of whether you  
15 can risk inform the current regulation or whether you  
16 would need to change a rule which is obviously a huge  
17 undertaking.

18 CHAIRMAN WALLIS: Well, I'm really  
19 wondering, you made an initial statement that we  
20 should have had a subcommittee meeting. We seem to be  
21 at the level of behaving like a subcommittee so trying  
22 to determine whether or not you are ready to go to the  
23 full Committee because there seems to be so many  
24 questions here. And yet we are here as a full  
25 Committee.

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1                   MEMBER DENNING: That is why we have three  
2 whole hours.

3                   CHAIRMAN WALLIS: You know subcommittees  
4 sometimes have the option of saying you guys aren't  
5 ready. You shouldn't go to the full Committee. But  
6 they are here.

7                   MEMBER DENNING: The full Committee has  
8 that same option, doesn't it?

9                   MR. WOLFGANG: To continue, in 2004, staff  
10 held a public meeting in Atlanta to discuss the staff  
11 positions and solicit stakeholder feedback. We worked  
12 with NEI to finalize an acceptable industry guidance  
13 document for circuit analysis. And that was NEI 0001.

14                   Staff issued RIS 2005-30 to clarify  
15 regulatory requirements for a circuit analysis. And  
16 that RIS addressed the terms associated circuits, any  
17 and all, and emergency control stations.

18                   And this draft generic letter was issued  
19 for public comment in October 2005. We held a public  
20 meeting in March of this year. And the pertinent  
21 public comments were incorporated into the final draft  
22 of the generic letter. And we also received CRGR  
23 approval to issue the generic letter.

24                   The basis for the generic letter -- the  
25 bulleted review of NRC regulations, generic

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1 communications, correspondence related to this issue.  
2 And we have references identified in the generic  
3 letter. The results of the 2001 NEI EPRI cable fire  
4 test program, prior to the cable fire test, there was  
5 very little information available regarding circuit  
6 failure during a fire which made enforcement of the  
7 regulations in this area difficult. And also input  
8 from inspectors on issues that needed to be addressed.

9 The issue clarified in the generic letter  
10 is multiple spurious actuations. As Dan said earlier,  
11 some licensees claim that only a single spurious  
12 actuation had to be assumed in their circuit analysis.  
13 This was based on a misinterpretation of Generic  
14 Letter 86-10 in response to question 5.3.10.

15 And also some licensees claimed multiple  
16 spurious actuation occur with sufficient time in  
17 between them to take mitigating actions.

18 CHAIRMAN WALLIS: Now this  
19 misinterpretation has been going on for how long?  
20 D.L. 86 is 9/86?

21 MR. WOLFGANG: Yes.

22 CHAIRMAN WALLIS: Over 20 years they have  
23 been under some misapprehension about the regulations?

24 MR. WOLFGANG: That is my understanding.

25 MR. FRUMKIN: In this section of the

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1 generic letter, it refers to the 3(g)(iii) associated  
2 circuits I believe. So it took 3(g)(iii) alternate  
3 shutdown -- I'm sorry -- it took this 3(g)(iii)  
4 assumption and applied it to 3(g)(ii) areas. And that  
5 is what this misinterpretation is describing.

6 MEMBER APOSTOLAKIS: Let me understand it  
7 a little bit the second bullet here. Suppose there is  
8 sufficient time between actuations? Okay, so you have  
9 the first one. You really don't know what the second  
10 one is going to be, right? It could be anything.

11 MR. WOLFGANG: Second.

12 MEMBER APOSTOLAKIS: Oh, let's say there  
13 are two --

14 MR. WOLFGANG: Actuations?

15 MEMBER APOSTOLAKIS: -- spurious -- yes.

16 MR. WOLFGANG: Yes, based on these tests,  
17 they could occur --

18 MEMBER APOSTOLAKIS: No, I understand  
19 that, that it is a very short time.

20 MR. WOLFGANG: Right.

21 MEMBER APOSTOLAKIS: But let's assume for  
22 a moment that there is sufficient time, there is long  
23 time between them.

24 MEMBER DENNING: And there may be, George.  
25 There is a contention that --

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1 MEMBER APOSTOLAKIS: Okay.

2 MEMBER DENNING: Yes, right.

3 MEMBER APOSTOLAKIS: But you still don't  
4 know what the second one is going to be.

5 MEMBER DENNING: Is going to be, right.

6 MEMBER APOSTOLAKIS: So you can really  
7 take mitigations actions without know what the second  
8 will be?

9 MEMBER DENNING: Well, now wait a second.  
10 If you have mitigated the first one --

11 MEMBER APOSTOLAKIS: Yes.

12 MEMBER DENNING: -- then it is as if you  
13 now just have one.

14 MEMBER APOSTOLAKIS: Oh, so now you are  
15 going to get together and wait.

16 MR. WOLFGANG: And when the second one  
17 occurs and you have time to mitigate that one.

18 MEMBER APOSTOLAKIS: And this is doable?  
19 I mean has anybody looked into the details of this?  
20 It comes back to this issue of open endedness. You  
21 really don't know what is going to happen next. So I  
22 don't understand this particular -- I mean have they  
23 submitted details, you know, if you have sufficient  
24 time, you will protect the plant?

25 MEMBER DENNING: You know what I think

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1 would help us is we had some better feeling as to how  
2 do they really mitigate these actuations?

3 MEMBER APOSTOLAKIS: Yes, exactly,  
4 exactly.

5 MEMBER DENNING: What is a typical -- and  
6 I know there are constraints on manual --

7 MR. WOLFGANG: Yes, in 3(g)(ii), they  
8 can't use manual actions.

9 MR. KLEIN: Licensees have commonly used  
10 operator manual actions to mitigate that spurious  
11 actuation. They may send an operator out in a plant  
12 to close a valve or some such action like that. And  
13 then they wait for the next actuation and they say,  
14 okay, I've got plenty of time available to have taken  
15 that first action. And now they wait for the second  
16 action. And when that occurs, they send the operator  
17 out.

18 So I think that second bullet there is to  
19 just simply indicate to the Committee that that is the  
20 claim that some licensees have made. That is not  
21 necessarily a position that the staff agrees with.

22 MEMBER APOSTOLAKIS: No, I understand  
23 that.

24 MR. WOLFGANG: Yes.

25 MEMBER APOSTOLAKIS: But I'm trying to

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1 understand the position.

2 MEMBER DENNING: Now suppose you had --  
3 suppose it takes 30 minutes to have them get out there  
4 and close the valve, now obviously -- more than, you  
5 know, and then something else happens say before he  
6 closes that valve, then the real question is there a  
7 compounding effect?

8 MR. WOLFGANG: And I guess like --

9 MEMBER DENNING: As far as you don't have  
10 enough operators that you can send out to do all these  
11 --

12 MEMBER APOSTOLAKIS: The real question is  
13 is the length of time the critical variable here. And  
14 it doesn't seem to me to be.

15 MR. FRUMKIN: I mean we'll give you an  
16 example, for example if you have a -- you going to  
17 drain two valves in series that would drain the RWST  
18 and you also damage a number of other equipment. They  
19 fail. They short out and become unavailable.

20 Well, if you have -- if you lose the  
21 indication on the RWST and you open up the valve and  
22 you say you have plenty of time to -- you have  
23 indication the valve opened spuriously, you can go  
24 down and close the valve and then when the next valve  
25 opens, it has no effect.

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1 I think that would be an example of where  
2 they feel they would have sufficient time. Let's say  
3 the circuits are in cable trays -- you know, 20, you  
4 know, six cable trays above. There is going to be a  
5 good deal of time before the first cable tray is  
6 damaged and the next -- the first cable is damaged and  
7 then the next cable.

8 So -- and from a risk standpoint, you  
9 might be able to argue yes, we will have adequate  
10 indication that the valve opened and we have adequate  
11 time. And then that could be a risk-informed type  
12 analysis.

13 But if they are in the same cable, then  
14 they both could open simultaneously.

15 MEMBER MAYNARD: If there is time and  
16 there are a number of things they can do, when you  
17 have a fire in an area, you typically know what cables  
18 and what other things could be potentially effected in  
19 that and the manual actions going out either manually  
20 isolating valves, pulling breakers, a number of things  
21 you can do. But it is based on what is in that area  
22 or what could be effected with those in that area.

23 MEMBER APOSTOLAKIS: I remember when I was  
24 reading the analysis of the Browns Ferry fire a long  
25 time ago. They did have spurious actuations there did

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1 they not?

2 MR. WOLFGANG: Yes.

3 MEMBER APOSTOLAKIS: Within 20 minutes I  
4 believe they had all sorts of signals and so on. And  
5 then things started going dead. How does that  
6 experience fit into this?

7 MR. FRUMKIN: I think that experience is  
8 "the long-held staff position" that multiple  
9 simultaneous spurious actuations occur. I think when  
10 you want to point your finger to where we come up with  
11 that, it comes from 1975. It comes from the very  
12 beginning of fire protection regulation is that these  
13 spurious actuations occur.

14 And I think that -- unfortunately the  
15 statements of consideration for Appendix R are short.  
16 You know we have, you know, dozens of pages for a  
17 short NFPA-805 and there may be a dozen pages and a  
18 page maximum for 3(g)(iii) -- for 3(g) of Appendix R.  
19 So we really can't go back in time and pull out the  
20 basis for that. But we have Mark Sallies here, he  
21 might be able to shed some light on that.

22 But I believe that that is the long-held  
23 staff position is the Appendix R fire and these  
24 multiple spurious and rapid succession starting pumps  
25 giving incorrect indication, doing all sorts of

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1 unpleasant things to the plant.

2 CHAIRMAN WALLIS: The incorrect indication  
3 is a big problem. Something has happened and yet you  
4 don't know quite what has happened. That is another  
5 variable altogether from the time. I mean it is the  
6 uncertainty of knowing what is going on which might  
7 lead the operator to do the wrong thing.

8 MEMBER-AT-LARGE SIEBER: Yes, on the other  
9 hand, indications usually either go full scale or to  
10 zero.

11 MEMBER MAYNARD: A lot of times you've got  
12 multiple indications. And that is something they are  
13 trained on quite a bit is on instrument failures.  
14 That said, it is not uncommon to have an instrument  
15 failure without a fire. So they are trained on how to  
16 handle that.

17 MR. FRUMKIN: Right. One of the failure  
18 though they can also get -- and, again, there's  
19 multiple indications, but they could get an indication  
20 of a pump starting when it didn't start. Or a pump in  
21 a start and stop position and then that's going to  
22 take time for them to troubleshoot and whether it was  
23 started or stopped could it be adversely effecting  
24 overfilling the plant or not.

25 There are a number of timing issues that

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1 I'm sure they are trained on. But they can be  
2 potentially challenging.

3 MEMBER DENNING: Continue.

4 MR. WOLFGANG: The NRC letter from Sam  
5 Collins to NEI in 1997 stated that multiple spurious  
6 actuations caused by fire-induced hot shorts must be  
7 considered and evaluated. As I stated earlier, Byron  
8 and Braidwood have SCRs approving the assumption of a  
9 single spurious actuation for a fire event. So if the  
10 staff position is applied to them, it would be  
11 considered compliance backfit.

12 The generic letter --

13 MEMBER-AT-LARGE SIEBER: That's a unique  
14 case, those two plants.

15 MR. WOLFGANG: Yes, correct. The generic  
16 --

17 MEMBER APOSTOLAKIS: But what does that  
18 mean now?

19 MR. WOLFGANG: They are in compliance by  
20 definition.

21 MEMBER APOSTOLAKIS: You would say the SCR  
22 was not correct or what?

23 MR. WOLFGANG: They are in compliance by  
24 definition, right.

25 MEMBER APOSTOLAKIS: But I don't

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1 understand this compliance backfit.

2 CHAIRMAN WALLIS: Compliance by mistake is  
3 what I heard earlier.

4 MR. WOLFGANG: Well, by regulatory  
5 approval.

6 MEMBER APOSTOLAKIS: Can you explain the  
7 parenthesis? If stop position is applied to them, it  
8 would be a compliance backfit. You mean the current  
9 position?

10 MR. WOLFGANG: If they comply with their  
11 SER, the SER is approved even though it was a mistake,  
12 it would be a compliance backfit if we made them  
13 change.

14 MEMBER APOSTOLAKIS: So you would have to  
15 admit then that the SER was not correct?

16 MR. WOLFGANG: We have already admitted  
17 that.

18 MEMBER APOSTOLAKIS: Okay.

19 MEMBER MAYNARD: It is a matter of what  
20 regulatory process is used to actually do it. A lot  
21 fo people think backfit is a bad thing. I think it is  
22 a process that should be used a little bit more rather  
23 than trying to go around a lot of these things. Just  
24 say hey look, we've changed or this is a new  
25 requirement. Here's the regulatory burden. Here is

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1 the increased safety benefit. We are imposing this as  
2 the new requirement for you. It's not necessarily a  
3 bad thing. Just what regulatory burden --

4 MEMBER APOSTOLAKIS: But this doesn't  
5 happen too often, right? I mean --

6 MEMBER DENNING: What? Regulatory  
7 mistakes?

8 MEMBER APOSTOLAKIS: Yes.

9 MEMBER DENNING: Right.

10 CHAIRMAN WALLIS: Well, this last bullet,  
11 I have a lot of problem with. And they must be  
12 considered and evaluated. But it seemed to be very  
13 unclear about to what depth and by what methods these  
14 things must be considered and evaluated. That seems  
15 to be so open-ended that the licensee must be  
16 uncertain what he has to do.

17 MEMBER DENNING: RIS provides more detail  
18 than the generic letter does, right. The 2005 RIS.

19 MR. WOLFGANG: 2005-30?

20 MEMBER DENNING: Yes.

21 MR. WOLFGANG: Not on multiple spurious  
22 actuations, no.

23 MEMBER DENNING: No?

24 MR. WOLFGANG: It doesn't address that.

25 We didn't put that in there because we thought

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1 multiple spurious actuations because of this Byron and  
2 Braidwood SCR could be considered possibly a change in  
3 staff position. So that's why we didn't want to put  
4 it in a RIS.

5 CHAIRMAN WALLIS: There is no regulatory  
6 guide that says how to evaluate multiple spurious  
7 actuations?

8 MR. KLEIN: I think if I could respond to  
9 that question, I'll ask Dan also to pipe in. Is on  
10 page 7 of the generic letter where we do talk about,  
11 you know, ways that licensees can bring themselves  
12 into compliance, there is a discussion in there about  
13 the deterministic methodology or NEI-0001.

14 We do talk about the guidance in there in  
15 Chapter 3. We do say that for post-fire safe-shutdown  
16 circuits in conjunction with the guidance provided in  
17 this generic letter that NEI-0001 is one of the  
18 acceptable approaches to achieve regulatory compliance  
19 with the fire protection requirements for multiple  
20 spurious actuations.

21 So that's one example. And Dan can  
22 correct me if I've overstated this.

23 MR. WOLFGANG: And we say in conjunction  
24 with the guidance provided in this generic letter to  
25 mean consider multiple spurious actuation. I believe

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1 NEI-0001 says to consider two spurious actuations.

2 CHAIRMAN WALLIS: That doesn't mean  
3 anything to me. It could simply mean to say well I  
4 considered it and I think it is irrelevant or  
5 something. I mean what does consider mean? But what  
6 depth? By what methods?

7 MEMBER APOSTOLAKIS: To the depth required  
8 to convince the staff.

9 MEMBER BONACA: That is called open ended.  
10 We could fix it here but it seems to me that, you  
11 know, we do have a problem. And we are trying to  
12 figure out what is the best regulatory process to  
13 solve it. But the problem is there.

14 CHAIRMAN WALLIS: Well, I think we agree  
15 there is a problem. It is just whether or not there  
16 is a mature enough process in place to make something  
17 that is workable happen.

18 MEMBER BONACA: I understand.

19 MEMBER-AT-LARGE SIEBER: Well, this work  
20 has already been done once. The only thing that  
21 changed is the disqualification of certain fire  
22 barriers. All the licensees have done this. And it  
23 should be part of their licensing basis. There should  
24 be plant records as to how they did it the first time.

25 MEMBER DENNING: Really, Jack? I mean

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1 isn't there an issue here of the number of licensees  
2 who thought that they were really dealing with one  
3 spurious actuation requirement? Or one at a time?

4 MEMBER-AT-LARGE SIEBER: I can only speak  
5 to one licensee or about one licensee. And that was  
6 not the assumption.

7 MEMBER DENNING: That was not your  
8 assumption.

9 MEMBER-AT-LARGE SIEBER: No.

10 MEMBER DENNING: No. But there are  
11 licensees out there --

12 MEMBER-AT-LARGE SIEBER: Otto, was that  
13 yours? It is sort of obvious from Browns Ferry that  
14 you get more than one.

15 MEMBER MAYNARD: I'm trying to recall  
16 because the only place where we had different trains  
17 mixing was in the control room so it was primarily a  
18 control room-related issue.

19 MEMBER KRESS: But that is one purpose of  
20 the generic letter to find out the status.

21 MEMBER-AT-LARGE SIEBER: The only time the  
22 number of faults becomes an issue is when you are  
23 trying to solve the problem with operator manual  
24 actions. So now you've got too many things for too  
25 few people to do.

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1           But if you have train separation and the  
2 train separation is effective, you are going to get  
3 some spurious actuations which are going to be  
4 upsetting but not fatal. And you are still going to  
5 maintain a full set of safety equipment that  
6 functions. And that is the object of the fire  
7 protection regulation.

8           MR. KLEIN: I would strongly agree with  
9 what Dr. Sieber just indicated in that the focus here  
10 is on 3(g)(ii) compliance and that is where you've got  
11 the redundant trains in the same fire area as Dan had  
12 indicated. And Dan had indicated some of the history  
13 that, you know, led us up to this.

14           And that had to do with the resolution  
15 that some licensees used to address the thermal lag  
16 issue where they removed some of these fire barriers  
17 and in lieu of meeting the separation requirements of  
18 3(g)(ii), elected to put in place the use of operator  
19 manual actions.

20           And I think that is a very important thing  
21 to kind of keep in mind.

22           MEMBER-AT-LARGE SIEBER: But other  
23 licensees pulled no cable.

24           MR. KLEIN: That is correct. I'm not --

25           MEMBER-AT-LARGE SIEBER: They moved

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1 circuits out of the same fire area.

2 MR. KLEIN: Yes, I'm not suggesting that  
3 all licensees implemented unapproved operator manual  
4 actions in lieu of the requirements of 3(g)(ii).

5 There are other licensees who did plant modifications,  
6 did re-analysis, did re-wraps, pulled cables, what  
7 have you to bring themselves back into compliance with  
8 3(g)(ii).

9 MEMBER-AT-LARGE SIEBER: And some of them  
10 didn't use thermal lag to begin with.

11 MR. KLEIN: That is correct.

12 CHAIRMAN WALLIS: Well, I don't really  
13 have a good understanding of what kind of spurious  
14 actions we are talking about, what kind of operator  
15 actions in response we're talking about, and whether  
16 redundant trains solve the spurious action problem.

17 If I have a fire scenario and it switches  
18 on my high pressure injection, I've got a pump that  
19 runs and it is pouring water into the system, right?  
20 For one thing, I have to know -- I have to diagnose  
21 what is happening. Do I have to send somebody  
22 somewhere to shut a valve? And does that factor have  
23 some redundant train help me at all when something has  
24 been activated spuriously? I mean it is not clear to  
25 me what the range of kind of scenarios is that you are

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1 talking about here.

2 And whether redundant trains always help  
3 you or don't. Maybe they don't help you at all  
4 sometimes. And maybe the operator action sometimes is  
5 so severe that it is very difficult to take.

6 MEMBER MAYNARD: I think in most cases,  
7 there are things they can do. But there are some --  
8 and I think the power operator relief valve is one  
9 that if you have a system where you can't operate the  
10 block valve or the PRE, if it opens you basically have  
11 given yourself a small break.

12 CHAIRMAN WALLIS: That's what I think.  
13 When you think about TMR, they had a false indication  
14 because there was a light which said it was closed  
15 when it was open.

16 MEMBER MAYNARD: But most times you are  
17 still covered by -- I mean you are still analyzed for  
18 a small break LOCA or for the other events. A pump  
19 coming on, there are multiple ways to turn pumps off.  
20 And you are not going to be injecting water at such a  
21 rate that you have, you know -- I'm kind of talking  
22 more PWR than I am BWN here so I --

23 MEMBER DENNING: But it is those things  
24 though -- it is the multiplicity of those things that  
25 boggles my mind. You know rather than train

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1 separation and train protection which you talked  
2 about, it just seems like there is such a multiplicity  
3 of potential things and trying to analyze all those  
4 things seems almost open ended.

5 MEMBER-AT-LARGE SIEBER: There aren't --  
6 in sheer numbers, there aren't all that many safety  
7 circuits. And if you go underneath the control room  
8 into the faucet rafter, you'll find loads of jumpers  
9 and knife switches and things like that where you can  
10 de-energize control circuits.

11 Now one of the problems is that it  
12 actually, in a lot of circuit breakers, it takes power  
13 to trip it, you know. The trip coil requires  
14 energization so pulling a knife switch doesn't  
15 guarantee that it will run forever. And so the  
16 operator really has to understand how the control  
17 system is set up to be able to do that.

18 But there are ways to overcome these  
19 problems that don't require excursions all over the  
20 plant. And on the other hand, the plant is designed  
21 to be safe provided that you have a functional safety  
22 train. Separation criteria, if rigidly applied,  
23 provides that independent safety train.

24 MEMBER DENNING: We are going to now take  
25 our break until 20 after 10. And then we will have to

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1 move surprisingly quickly after that.

2 CHAIRMAN WALLIS: Okay. So we're going to  
3 take a break until 20 past 10.

4 (Whereupon, the foregoing matter went off  
5 the record at 10:09 a.m. and went back on the record  
6 at 10:23 a.m.)

7 CHAIRMAN WALLIS: Rich, would you resume  
8 the management of the meeting, please?

9 MEMBER DENNING: Please proceed.

10 MR. WOLFGANG: Okay. The last issue,  
11 clarifying the generic letter, the point we have here  
12 is the staff position on multiple spurious actuations  
13 presented in the generic letter is consistent with  
14 section 9.5.1 of the standard review plan.

15 Public comments. The significant public  
16 comment was that the generic letter constituted a  
17 backfit to licensees. And we addressed this comment.  
18 We obtained CRGR approval to issue this generic  
19 letter. And, as I said earlier, only for Byron and  
20 Braidwood, who have approved SERs that we know of,  
21 would this constitute a backfit.

22 Basically, this generic letter is just a  
23 request for information.

24 MEMBER MAYNARD: I would challenge that.

25 MR. WOLFGANG: Yes. I think --

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1                   MEMBER MAYNARD: That's all right. We'll  
2 comment on that.

3                   CHAIRMAN WALLIS: It isn't just a request  
4 for information. It asks them to do a lot of things.

5                   MEMBER MAYNARD: Yes. That is what I  
6 challenge, that statement. Yes. We've talked about  
7 it.

8                   CHAIRMAN WALLIS: That was what I was  
9 uncertain about.

10                  MEMBER DENNING: Why don't you go ahead  
11 and summarize, even though we're going to have a  
12 couple of other things? Why don't you go ahead and  
13 summarize? Then there are a couple of other things we  
14 would like you to -- we have more than started. We're  
15 almost done.

16                  MR. WOLFGANG: A summary. The generic  
17 letter, as I said before, is a request for information  
18 from licensees. The industry cable fire test program  
19 reaffirmed the staff interpretation of the regulatory  
20 requirements concerning multiple spurious actuations  
21 must be considered in the circuits analysis. The  
22 generic letter is necessary to ensure that all  
23 risk-significant circuit situations are identified and  
24 addressed.

25                  CHAIRMAN WALLIS: Could you go back a bit

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1 and say something about why this came about? I mean,  
2 wasn't this something to do with this thermal lag  
3 business? All of these installations, like Hemmicks  
4 and Eastern, every time we look at them --

5 MR. WOLFGANG: Yes.

6 CHAIRMAN WALLIS: Well, isn't that the  
7 solution would be to have a proper barrier around  
8 these things?

9 MR. WOLFGANG: That's one solution, yes.

10 MEMBER DENNING: I don't see that as a  
11 total solution. I don't --

12 MR. WOLFGANG: That is one solution.  
13 Another solution is a separation, 20-foot separation.

14 CHAIRMAN WALLIS: But in the past, when we  
15 believed that this thermal lag worked, there wasn't a  
16 problem. Is that right?

17 MEMBER MAYNARD: No. I think the problem  
18 was still there then. This has been bounced around  
19 since I know at least the early '80s as an issue. I  
20 think the thermal lag, it helped in some cases where  
21 you could show separation in the trains, but it  
22 doesn't necessarily take care of you if you've got  
23 cables in the same area that are --

24 MEMBER DENNING: Right. They can still  
25 give you spurious actuation, regardless.

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1 MEMBER MAYNARD: Right.

2 MEMBER DENNING: Now, it may be -- do you  
3 have any comments on that?

4 MR. FRUMKIN: Yes. If you have the  
5 separation, you can still get spurious actuations.  
6 And that's a box that we're not in with the rule. The  
7 rule does not require that those be protected. So all  
8 plants have the flexibility for the unprotected train  
9 to mitigate through feasible and reliable manual  
10 actions those types of spurious actuations.

11 Now, if you were to get a spurious  
12 actuation that were to give you all incorrect  
13 indication and was not recoverable, then that would  
14 still have to be resolved because it would be a  
15 potential safety issue. But for the minor ones that  
16 we have been talking about that would be fairly easy  
17 to resolve through a manual operator action or there  
18 are procedural controls or something of that nature,  
19 that would not be a compliance issue per se.

20 MEMBER DENNING: Help me with that because  
21 I still don't quite understand it. So if you have a  
22 protected train and you get a spurious actuation from  
23 an unprotected train, then you have to analyze all  
24 combinations of spurious actuations still, don't you,  
25 that are possible in that unprotected train?

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1 MR. FRUMKIN: Alex, do you want to?

2 MR. KLEIN: Yes, I believe you do because  
3 the over-arching requirement of appendix R is to be  
4 able to safely bring your plant to safe shutdown. And  
5 if you don't know what's occurring in your plant, then  
6 you can't meet that over-arching high-level goal of  
7 achieving and maintaining safe shutdown of your plant.

8 MR. FRUMKIN: And I will just say that  
9 once you have your protective train, your protected  
10 train, your unprotected train has a very limited set  
11 of things that could hurt you.

12 Now, we're talking we have plenty of  
13 water. We have plenty of indication. We have plenty  
14 of everything. But now we might open, we might cause  
15 a drain letdown path to open or we might cause a pump  
16 to start, but we should be getting clear indication of  
17 that in the control room. And in the normal  
18 procedure, process, you'll be getting indication of  
19 these things happening. And they should be able to  
20 mitigate them fairly effectively.

21 Now, there may be some things that would  
22 be difficult to mitigate. And, as Alex says, they  
23 have to find those and find a way to mitigate them.

24 MEMBER DENNING: So you have lots of  
25 things you have to analyze, but the mitigation of it

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1 is probably not too severe for the plant, and the  
2 plant is allowed to do manual action on it.

3 Now, there is another set here. So what  
4 is the other set? Aren't you always required to have  
5 a protected train?

6 MR. FRUMKIN: Yes. And these plants don't  
7 have that protected train. In effect, all circuit and  
8 manual action findings or potential violations are  
9 lack of protection, lack of circuit protection.

10 MEMBER DENNING: Circuit separation.

11 MR. FRUMKIN: So when --

12 MEMBER DENNING: Separation of the --

13 MR. FRUMKIN: Right. So when a finding  
14 comes in, let's say we have that hypothetical finding,  
15 which opens up and drains down the RWST. The citation  
16 is going to be against 3G2, lack of separation and  
17 lack of protection.

18 Now, we don't require one protection  
19 method over another, but they didn't put a protection  
20 method in there to protect the -- well, RWST is a bad  
21 example because it is not a necessarily one-train  
22 system.

23 But let's say you have both trains being  
24 affected by a fire. And here this is probably what is  
25 the more likely scenario. One train is just going to

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1 be damaged by the fire and not work, and then the  
2 other train is going to have the spurious actuation.

3 We don't necessarily need both trains to  
4 have spurious actuations. So that's the situation.  
5 It doesn't have to be multiple spurious on multiple  
6 trains.

7 MEMBER APOSTOLAKIS: Have we agreed that  
8 the first bullet is not quite correct? We're asking  
9 for more than just information?

10 MR. FRUMKIN: It's clear.

11 MEMBER APOSTOLAKIS: Yes.

12 MEMBER DENNING: It just takes them a lot  
13 of work to do it. I think we all recognize that it's  
14 a request for information, but in order to produce  
15 that information, you have to do a lot of work.

16 MEMBER APOSTOLAKIS: Right. It sounds to  
17 me like the priest saying, you know, "I know you're a  
18 sinner, George. Now, you go away and think of all the  
19 ways in which you could be a sinner and come back and  
20 tell me what they are." I have thought about it.

21 CHAIRMAN WALLIS: It's already been  
22 analyzed.

23 MEMBER APOSTOLAKIS: I protected myself.

24 MEMBER DENNING: Let's go on. And I would  
25 like to hear the conservative risk analysis. And so

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1 would you give us a little presentation on the  
2 conservative risk analysis?

3 MR. FRUMKIN: Are you done with all of  
4 your slides?

5 MEMBER DENNING: Yes.

6 MR. WOLFGANG: Yes. I just want to say  
7 one thing. If we don't issue a generic letter, we'll  
8 have to use the inspection process behind these  
9 problems.

10 It will take longer. We estimate three  
11 triennials, nine years. And some risk-significant  
12 items may be missed. We don't know because the burden  
13 is put on us, instead of the licensee. I just want to  
14 bring it up.

15 MEMBER DENNING: Thank you.

16 MEMBER BONACA: Is it with regard to the  
17 90 days with the responses? I mean, how did you come  
18 up with the 90 days, recognizing that you have to go  
19 to award to provide these responses? Was there an  
20 evaluation that you performed?

21 MR. WOLFGANG: No.

22 MEMBER BONACA: I mean, can it be changed?

23 MR. WOLFGANG: It can be changed. It was  
24 an arbitrary period that we thought was --

25 MEMBER APOSTOLAKIS: Or you can reduce the

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1 requirement.

2 MR. WOLFGANG: Yes, or we can --

3 MEMBER APOSTOLAKIS: So we don't have  
4 these?

5 MR. FRUMKIN: No, you don't have these  
6 slides. We will be making them available.

7 MR. KLEIN: Just as a reminder, if I can  
8 just follow up on the 90-day issue and the comments in  
9 regard to that, we do have a bullet in there that, for  
10 licensees who can't meet that 90-day requirement, that  
11 within the 30 days, they come in and request an  
12 extension.

13 MEMBER MAYNARD: Yes. And I saw that in  
14 the generic letter. If it's a situation where you  
15 know 90 percent of the industry is not going to be  
16 able to do it, you might as well be able to pick a  
17 date where everybody is not having to do it. I'll be  
18 interested in hearing from the industry as to whether  
19 they think that is a burden or not. I think I am  
20 assuming it is, but it may not be. So I don't know.

21 MR. FRUMKIN: This is a bounding risk  
22 analysis for multiple spurious actuations. It was  
23 developed for this meeting by Ray Gallucci, Dr. Ray  
24 Gallucci, who is in the Fire Protection Section. And  
25 it's been presented as a paper for the American

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1 Nuclear Society presentation. I think this winter  
2 they're having a meeting.

3 I am the third string presenter of this  
4 document. Ray is the first string. Dr. Weerakkody is  
5 the second string. And I'm presenting out of  
6 necessity.

7 MEMBER DENNING: Is Ray here to get beaten  
8 upon if he --

9 MR. FRUMKIN: No. Ray is on inspection at  
10 Browns Ferry. So we have --

11 MEMBER APOSTOLAKIS: Last time he was here  
12 he --

13 MEMBER DENNING: No wonder he's at Browns  
14 Ferry.

15 MR. KLEIN: Let me clarify. He's on a  
16 program review at Browns Ferry. He's not on an  
17 inspection.

18 MR. FRUMKIN: Okay. I'm sorry. These  
19 slides will be made available. My understanding of  
20 this analysis is using an older plant PRA that Ray was  
21 involved in, he pulled out some of the important  
22 measures for some hot shorts. And he recombined them  
23 into multiple hot shots and, using a simplification  
24 process, determined a bounding risk analysis for those  
25 based on those important measures for one plant's PSA.

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1           So this is the typical older nuclear power  
2 plant, has a fire CDF of  $3.3^{-5}$ . And they used a hot  
3 short probability of .1. They had modeled 24 of the  
4 basic events. And that contributed about 5 percent to  
5 the fire CDF or  $1.8D^{-6}$ .

6           And then there were some systematically  
7 symmetric redundant train components that were chosen  
8 because I think they had more of a larger impact on  
9 the plant risk if they were to fail together. And  
10 that was a contribution of .03 to the fire CDF, those  
11 10 items.

12           MEMBER DENNING: Let's go slowly so we --

13           MEMBER APOSTOLAKIS: Yes.

14           MEMBER DENNING: -- understand what we  
15 have here.

16           MR. FRUMKIN: Okay.

17           MEMBER APOSTOLAKIS: Twenty-four hot short  
18 basic events above truncation. What does that mean?

19           MR. FRUMKIN: That in the model, the ones  
20 that had remained as important remained having  
21 importance measures in the model, that there were only  
22 24 hot shorts that remained there.

23           MEMBER APOSTOLAKIS: The core damage  
24 frequency due to hot shorts is  $1.8 \cdot 10^{-6}$  per year, it  
25 says.

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1 MR. FRUMKIN: Correct, assuming a hot  
2 short probability of .1.

3 MEMBER APOSTOLAKIS: Which was low.

4 MR. FRUMKIN: Which is low based on  
5 current data.

6 MEMBER KRESS: Okay. So one, it would be  
7 1.8 times  $10^{-5}$ .

8 MR. FRUMKIN: If you said 1.0, correct.

9 MEMBER DENNING: Now, you said that that's  
10 low, but don't forget here that now we're talking  
11 supposedly real nuclear power plants with fires where  
12 you would take into account the fact that the fire may  
13 not damage any cables, you know.

14 MR. FRUMKIN: Right. Well, this is from  
15 an --

16 MEMBER DENNING: Oh, this is --

17 MR. FRUMKIN: -- old fire PSA. So this  
18 does consider --

19 MEMBER DENNING: Yes, it does.

20 MR. FRUMKIN: -- many of those factors.

21 MEMBER DENNING: But saying that the  
22 probability of your hot short is .1 and saying, "Well,  
23 that is low," I think because we saw those other  
24 things where people say, "Well, it could be .6 or .2  
25 or something like that," --

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1 MR. FRUMKIN: Right.

2 MEMBER DENNING: -- and, therefore, this  
3 is low, that doesn't necessarily follow.

4 MR. FRUMKIN: I think this is the  
5 conditional hot short probability based on cable  
6 damage.

7 CHAIRMAN WALLIS: How about multiple  
8 shorts come into this?

9 MR. FRUMKIN: That is what we are going to  
10 be talking about.

11 CHAIRMAN WALLIS: This doesn't address  
12 that?

13 MR. FRUMKIN: No, no. Right. This is  
14 what this analysis is. So assuming that the  
15 components within each pair -- these are those ten  
16 items that have been paired -- have similar failure  
17 characteristics and locations, including their cable  
18 runs, again, this is a conservative assumption and  
19 that these comprise the full set of candidates for  
20 multiple spurious actuations that are not specifically  
21 modeled in the traditional IPEEEs as --

22 MEMBER APOSTOLAKIS: The number you showed  
23 us earlier assumes that these happen independently?

24 MR. FRUMKIN: Yes.

25 MEMBER DENNING: You know, I still don't

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1 understand the pairing. What is going on here? Is it  
2 ten corresponding to --

3 MEMBER APOSTOLAKIS: Ten of these?

4 MEMBER DENNING: Five paired components.

5 That means that there is a --

6 MEMBER APOSTOLAKIS: Redundant elements.

7 MEMBER DENNING: They're redundant  
8 elements.

9 MEMBER APOSTOLAKIS: Yes.

10 MR. FRUMKIN: I believe what they did is  
11 of these 24, they took out 10 of them that could when  
12 combined have an issue.

13 MEMBER APOSTOLAKIS: They are still  
14 located in the --

15 MEMBER DENNING: It could lead to  
16 problems.

17 MR. FRUMKIN: On this slide, they're  
18 independent.

19 MEMBER APOSTOLAKIS: Yes.

20 MR. FRUMKIN: But I think what we're going  
21 to do is we're going to try to take out that and look  
22 at them as pairs. So this is what we're going to do,  
23 form a bounding analysis to estimate the potential  
24 maximum CDF due to multiple spurious actuations for  
25 this typical older MPP, which I think is what the

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1 target, the goal is here.

2 And now we start getting into some  
3 formulas. Per pair, one hot short corresponds to  
4 train A and the other to train B. So that's how they  
5 were paired. And they appear in symmetrically paired  
6 cut sets.

7 So one cut set, the CDF of A -- and  
8 there's the formula for that -- and the CDF of B,  
9 which is the fire initiator, and then the hot short or  
10 random failure of one of the paired components and  
11 then the summation of the B. Okay?

12 CHAIRMAN WALLIS: And where do the  
13 multiple shorts come in?

14 MR. FRUMKIN: This is the formula for --

15 CHAIRMAN WALLIS: It's between two trains,  
16 but it's not multiple shorts in the same cable.

17 MR. FRUMKIN: That's correct, not in the  
18 same cable.

19 CHAIRMAN WALLIS: It's still independent.  
20 And this formula that you have here, the cut sets, are  
21 still assuming that the --

22 MR. FRUMKIN: I think so. They're not  
23 going to be independent of the same fire and the same  
24 damage time, but they're going to be independent  
25 failures affected by the same fire.

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1 MEMBER APOSTOLAKIS: Conditional on the  
2 fire.

3 MR. FRUMKIN: Conditional on the fire.

4 MEMBER SIEBER: Which assumes the fire  
5 covers both things.

6 MR. FRUMKIN: Right, which is a  
7 conservative assumption in this analysis.

8 MEMBER SIEBER: Truly conservative.

9 MR. FRUMKIN: Yes.

10 MEMBER SIEBER: Improbable.

11 MR. FRUMKIN: Well, it depends on the  
12 design of the plant, but yes, it's --

13 MEMBER APOSTOLAKIS: So if I want to  
14 couple them, then, I will assume that Fa and Fb are  
15 just F, one fire. Is that correct? And then I will  
16 have --

17 MEMBER DENNING: A is --

18 MEMBER APOSTOLAKIS: Otherwise they are  
19 still independent. I mean, the fire initiator must be  
20 the same.

21 MR. FRUMKIN: Well, let's just hope that  
22 your answer --

23 MEMBER APOSTOLAKIS: We assume two  
24 different fires.

25 MEMBER DENNING: We'll go to the next

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1 slide. And maybe it will become clear.

2 MEMBER SIEBER: It's a lot clearer in  
3 here.

4 MR. FRUMKIN: Okay. So, again, we have --

5 MEMBER APOSTOLAKIS: This .1 comes from?

6 MR. FRUMKIN: The .1 was the  
7 state-of-the-art when they did this PSA of --

8 MEMBER APOSTOLAKIS: I'll tell you where  
9 it comes from.

10 MR. FRUMKIN: Okay.

11 MEMBER APOSTOLAKIS: That's 20 years or so  
12 ago.

13 MEMBER DENNING: You're responsible for  
14 .1?

15 MEMBER APOSTOLAKIS: I saw it, and I said,  
16 "Well, gee. How did you come up with that?"

17 So they said, "Well, call this guy"  
18 somewhere in California.

19 I called this guy. He says, "Well, you  
20 know Sandia told us that."

21 "What Sandia?"

22 "This person."

23 So I called this person in Sandia. He  
24 says, "Well, I really don't know. It's this other  
25 guy."

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1           So I called this other guy. And he says,  
2 "You told us that."

3           (Laughter.)

4           MEMBER DENNING: So we're going to accept  
5 the .1.

6           MEMBER APOSTOLAKIS: It wasn't followed up  
7 at all. I mean, that was the funniest thing.

8           MR. FRUMKIN: The IPEEE assumed this hot  
9 short probability of .1. And then I believe we're  
10 doing a simplification of these factors here. And it  
11 actually gets very simple on the next slide, but if  
12 anyone really wants me to read through this, I can  
13 try.

14           MEMBER DENNING: You know what we'll do?  
15 Let's go to the bottom line.

16           MR. FRUMKIN: The bottom line.

17           MEMBER DENNING: And we'll have copies of  
18 this.

19           MR. FRUMKIN: Okay. Yes.

20           MEMBER DENNING: And we'll --

21           MR. FRUMKIN: Okay. This is, I believe --  
22 well, let's see.

23           MEMBER APOSTOLAKIS: No. This is --

24           MR. FRUMKIN: This is the bottom line  
25 here.

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1 MEMBER APOSTOLAKIS: Go back a little bit.

2 MR. FRUMKIN: I think --

3 MEMBER APOSTOLAKIS: This Fa plus Fb I  
4 don't understand. I thought it was going to be 1.5.

5 CHAIRMAN WALLIS: That's two fires, isn't  
6 it?

7 MEMBER APOSTOLAKIS: This is one or the  
8 other, yes, one or the other.

9 MR. FRUMKIN: Yes.

10 MEMBER APOSTOLAKIS: It doesn't really --  
11 I mean, he should have assumed one fire as far as I  
12 can tell. But, again, the --

13 MEMBER DENNING: We will look at it  
14 carefully.

15 MEMBER APOSTOLAKIS: -- connection is  
16 nothing, I mean, right?

17 MEMBER DENNING: We will look at it  
18 carefully later.

19 MR. FRUMKIN: Right. That would be a  
20 small difference.

21 MEMBER DENNING: And Ray's bottom line  
22 again is?

23 MR. FRUMKIN: Okay. Well, what he does  
24 here is he's taking out the  $1.1E^{-6}$ . And he's putting  
25 in this value or coming up with this value of .011,

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1 which is his surrogate simplification for all of the  
2 fires and his X factor, which is his fire and his  
3 failure factor.

4 MEMBER APOSTOLAKIS: He's bounding the  
5 random failures, right, by assuming a  $10^{-3}$ , right?

6 MR. FRUMKIN: I believe so.

7 MEMBER APOSTOLAKIS: Yes.

8 MR. FRUMKIN: Typical, right.

9 MEMBER APOSTOLAKIS: But he doesn't know  
10 how many -- oh, this is a bound on all random failures  
11 that are required.

12 MR. FRUMKIN: Yes.

13 MEMBER DENNING: Continue. Let's see.

14 MR. FRUMKIN: Okay. And now he's talking  
15 about the dual failures. Any of the ten paired hot  
16 shorts would appear in the cut sets. And Fa is the S,  
17 which is your severity factor, which going to reduce  
18 your likelihood of more hot shorts, which is the  
19 likelihood of having a big fire that's going to cause  
20 this damage.

21 CHAIRMAN WALLIS: Which affects both  
22 trains?

23 MR. FRUMKIN: Right. And then your  
24 various factors, A hot, B hot short, and then your  
25 random factors.

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1 MEMBER APOSTOLAKIS: Why square? Why A  
2 hot times A hot? It still assumes that they're  
3 independent events, right?

4 CHAIRMAN WALLIS: Well, that is the A hot  
5 times B hot --

6 MEMBER DENNING: It is going to take us  
7 some time to really work through this. Rather than do  
8 this here, --

9 MR. FRUMKIN: Okay.

10 MEMBER DENNING: -- let's go see Ray's  
11 bottom line.

12 MR. FRUMKIN: Okay. The bottom line is  
13 here.

14 MEMBER APOSTOLAKIS: All right.

15 MR. FRUMKIN: So for his choice of fires,  
16 for severity factor, I think he used a .1 for this  
17 extreme fire, which is an S.

18 CHAIRMAN WALLIS: Why is .1 extreme? It  
19 could be .5.

20 MR. FRUMKIN: Oh, no, no, no. This is for  
21 the likelihood of a large fire.

22 CHAIRMAN WALLIS: Yes. But just asking  
23 George Apostolakis by telephone tag --

24 MR. FRUMKIN: Oh, no. This is not his .1.

25 CHAIRMAN WALLIS: I thought it was his .1.

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1 MR. FRUMKIN: It's somebody else's .1.

2 MEMBER APOSTOLAKIS: This is from one of  
3 my students.

4 MR. FRUMKIN: That's right. Right. This  
5 .1 is from very likely the fire protection STP, which  
6 says that severe fires happen or ten percent of all  
7 fires that happen are severe, which is, again, a  
8 conservative number based on the state-of-the-art,  
9 which is the 6850 analysis.

10 But that's what we're doing with -- I  
11 mean, this is no question about it. This is a  
12 bounding analysis.

13 CHAIRMAN WALLIS: The ones that cause hot  
14 shorts?

15 MR. FRUMKIN: No. Instead of using a  
16 severity factor of one, assuming that all fires will  
17 cause the damage, we're only assuming that ten percent  
18 of the fires will cause the damage to cause hot short.  
19 So there are many different ways of severity --

20 MEMBER APOSTOLAKIS: So this .011, .011,  
21 is the frequency of fire or, no, this is from the  
22 random failure?

23 MR. FRUMKIN: Right.

24 MEMBER APOSTOLAKIS: According to one is  
25 one?

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1 MR. FRUMKIN: That's the severity factor.

2 MEMBER APOSTOLAKIS: What is the frequency  
3 of fire?

4 MR. FRUMKIN: What I believe he has done  
5 is I believe he has back-calculated through his  
6 simplification that .1 that he used. And he's turned  
7 that, the whole -- all of his important measures into  
8 this .011.

9 MEMBER APOSTOLAKIS: So that includes the  
10 frequency of fire?

11 MR. FRUMKIN: I believe so.

12 MEMBER APOSTOLAKIS: That's a pretty high  
13 number.

14 MR. FRUMKIN: Yes.

15 MEMBER DENNING: We are going to look at  
16 this carefully, but his bottom line is saying, well,  
17 what this could do in this particular case is it could  
18 have increased by a factor of three the fire damage  
19 frequency.

20 MR. FRUMKIN: I think what he's trying to  
21 say here is that when he back-calculates from his  
22 importance measures and then he combines these pairs,  
23 that -- and this is the bottom line here -- he can  
24 have a maximum of  $10^{-4}$  per year due to these pairs of  
25 hot shorts.

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1 MEMBER DENNING: And without it, they had  
2 3 times  $10^{-5}$  is what this plant did.

3 MR. FRUMKIN: Yes. That's the whole fire  
4 risk for the plant, is 3 times  $10^{-5}$ . So this could be  
5 dominating.

6 MEMBER APOSTOLAKIS: But why couldn't you  
7 go to an actual PRA and fix, instead of whatever they  
8 had, and see what happens, rather than doing this  
9 undue analysis? I mean, there are detailed fire PRAs  
10 out there.

11 MR. FRUMKIN: We don't actually have one  
12 in the office. He did have this information available  
13 to him.

14 MEMBER DENNING: What I would like to do  
15 is we would definitely like copies. Don't go  
16 anywhere.

17 MR. FRUMKIN: Okay.

18 MEMBER DENNING: And I don't think you  
19 have to read that. What we would like -- I mean, you  
20 can actually --

21 MR. FRUMKIN: Well, here his last slide is  
22 at least for a typical older nuclear power plant, one  
23 cannot a priori dismiss multiple hot shorts of being  
24 of lower significance.

25 MEMBER DENNING: Okay.

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1 MEMBER APOSTOLAKIS: Well, I would like to  
2 see the paper, please. No, no. Give me a copy.

3 MEMBER DENNING: Right. Yes, if we may.  
4 What we would like to do now is we would like to hear  
5 now from NEI, if we could. Don't run away, Research.

6 MEMBER APOSTOLAKIS: Don't anybody go  
7 away.

8 MEMBER DENNING: Don't anybody leave town  
9 other than me, but I would definitely like to make  
10 sure we have plenty of time to hear from NEI.

11 MEMBER APOSTOLAKIS: That's what I call  
12 running and meeting with --

13 MEMBER DENNING: The policeman is asked to  
14 lock the doors.

15 MEMBER APOSTOLAKIS: We have a cop  
16 outside?

17 MEMBER DENNING: And, Alex, you don't have  
18 handouts, but we can make them. Is that a true  
19 statement?

20 MR. MARRION: No, I do not have handouts.  
21 I do have a couple of comments.

22 MEMBER DENNING: You have comments?

23 MR. MARRION: Yes.

24 MEMBER DENNING: But you don't have any  
25 papers?

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1 MR. MARRION: No.

2 MEMBER DENNING: Okay. Please proceed.

3 MR. MARRION: Good morning. My name is  
4 Alex Marrion. I am a Senior Director of Engineering  
5 at NEI, and I appreciate the opportunity to offer a  
6 couple of comments on our perspectives on what we  
7 heard this morning.

8 Before I begin, I want to point out that  
9 we have two utility representatives, one from Progress  
10 Energy and one from Duke Power, who represent the two  
11 pilot plants for the application of NFPA 805.

12 And if the Committee so desires, I think  
13 it may be useful for you to understand the  
14 implications of this generic letter on the NFPA 805  
15 risk-informed application process. And I'll defer to  
16 you to --

17 MEMBER DENNING: We so desire.

18 MR. MARRION: Okay. Very good. Now I'll  
19 ask them to step up when I finish my comments.

20 To get back to Dr. Apostolakis' --  
21 George's comment, --

22 (Laughter.)

23 MR. MARRION: -- the test protocol and the  
24 issue of having cables exposed in the flaming region,  
25 I don't have any direct knowledge of that discussion

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1 with the NRC staff at the time we developed the test  
2 protocol. This was the first I heard of it, but I'll  
3 look into it. And we'll try to get an answer to you  
4 at the end of the week.

5 I do want to make it clear that we believe  
6 the multiple spurious actuation is a new regulatory  
7 position that results in significant impact on utility  
8 licensees, not only on the Appendix R, the NUREG 0800  
9 plants but also on the NFPA 805 plants.

10 The impact is significant in that it  
11 changes the methodologies that the utilities have  
12 credited in their licensing basis over the last 20  
13 years. So the licensing basis has to change.

14 Now, with that, it's perfectly appropriate  
15 for the NRC to say, "There's new information that has  
16 been brought to bear on this topic. And we have a new  
17 position." That's fine. But the NRC must bear the  
18 burden of demonstrating the safety impact of that new  
19 position and do a regulatory analysis to substantiate  
20 it because of the significant implications on the  
21 utility licensee design basis.

22 That's straightforward, but one thing that  
23 this position does not take into account is the  
24 fundamental elements of defense-in-depth relative to  
25 fire protection. What I'm talking about is the

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1 actions that are taken by licensees in preventing  
2 fires from occurring and detecting a fire when it does  
3 occur, having systems and personnel to respond to the  
4 fire to mitigate the consequences of the fire,  
5 suppression and detection systems, and then ultimately  
6 recovering the plant to assure that you can get into  
7 a safe condition.

8 We understand there is value to looking at  
9 risk-informed approaches and changes and assumptions  
10 and evaluating them accordingly, but I would recommend  
11 that we not lose sight of the defense-in-depth  
12 concepts as we go through this process going forward.

13 This generic letter is another example of  
14 what is fundamentally flawed with fire protection  
15 regulations and has been a problem with fire  
16 protection regulations and the associated regulatory  
17 process over the last 25 or 35 years.

18 And by that, I mean we have a continuous  
19 evolution of NRC positions and expectations that are  
20 addressed in a somewhat informal manner. And by that,  
21 I mean use of generic communications to articulate  
22 regulatory positions is, quite frankly, inappropriate.

23 New regulatory positions should be  
24 evaluated in terms of safety impact or clearly  
25 demonstrating the compliance issue associated with

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1 that new position. Then that has to be made publicly  
2 available so that the licensees can understand what  
3 these new positions are and what the basis for the  
4 positions are.

5 Historically in fire protection, it's been  
6 a plant-specific fire protection engineer from the  
7 licensee to an NRC inspector agreement of what the  
8 understanding is relative to an interpretation. And  
9 that is the problem that we're trying to fix. That's  
10 why we are so firm in our comments going forward,  
11 because fundamentally, gentlemen, if we don't address  
12 or we don't identify resolution to the spurious  
13 actuation issue today, it will be an issue for the  
14 NFPA 805 plants.

15 Going to 805 does not provide a resolution  
16 to this issue today because there is no understood  
17 methodology that can address the staff's position. I  
18 want to make that very clear.

19 MEMBER APOSTOLAKIS: Is this the  
20 open-ended issue that we discussed earlier?

21 MR. MARRION: Yes, yes. The comments made  
22 about CRGR approval of this generic letter, as an  
23 external stakeholder, that essentially is meaningless  
24 to us, reason being we are not privy to any kind of  
25 disciplined process that is used by CRGR or anyone

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1 within the NRC that clearly demonstrates this is the  
2 basis for the safety concern or this is the basis for  
3 the compliance concern.

4 What we have seen over the years -- and  
5 this is another example -- where the preferred route  
6 appears to be, well, let's make it a compliance  
7 concern because we as a regulatory agency, the NRC,  
8 can interpret the regulations. We have the right to  
9 interpret the regulations, et cetera, which is fine,  
10 but let's put the interpretation on paper. Let's  
11 identify resolution path so we have a common  
12 understanding going forward. We don't have that today  
13 on this particular issue.

14 Lastly, I would like to say that there  
15 isn't a generic letter that is simply a request for  
16 information. It should be clear from the discussion  
17 this morning that this generic letter basically  
18 imposes a new regulatory requirement that has  
19 significant impact on the licensing basis of current  
20 plants. That is not a request for information.

21 Those are the comments that I wanted to  
22 make this morning. I don't know if you have any  
23 questions on anything I said.

24 MEMBER DENNING: Yes, we do have some.  
25 One of them has to do with the timing, the 90 days,

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1 and the timing required to do the kind of analysis  
2 that's being requested there. Do you have a feeling  
3 as to what an appropriate time would be?

4 I mean, there's a timing that says, are  
5 you in compliance with this, which, regardless of this  
6 question, whether it's a new regulation or an old,  
7 there's no question the plant can determine that  
8 fairly quickly. But doing the entire analysis and  
9 determining what affected SSCs are, do you have any  
10 indication from the plants as to how much time that  
11 might take and what an appropriate time frame would be  
12 for a response like --

13 MR. MARRION: I don't have the information  
14 to answer the question, but I would submit that the  
15 next two individuals may be able --

16 MEMBER DENNING: May be of help on it?

17 MR. MARRION: -- to give you their  
18 perspectives.

19 MEMBER DENNING: Okay. Good.

20 MEMBER MAYNARD: Could I just --

21 MEMBER DENNING: Yes?

22 MEMBER MAYNARD: Your perspective comment  
23 was made that if the generic letter is not issued,  
24 then it would just have to be dealt with in inspection  
25 space. Do you have any comment on that?

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1 MR. MARRION: It is being dealt with in  
2 inspection space. Now, what we don't have is an  
3 external stakeholder. When I mention "we," I'm  
4 speaking of NEI and the industry. What is the safety  
5 case or what is the compliance case? And we haven't  
6 seen evidence of that clearly demonstrated that NRC  
7 action in this particular area is necessary in an  
8 expedited manner.

9 VICE CHAIRMAN SHACK: Just to address your  
10 methodology question, apparently you can deal with  
11 multiple actions if they come sequentially. So you  
12 have a methodology for that. And you're arguing that  
13 there isn't a methodology.

14 So it isn't necessarily the open-endedness  
15 of it that's the problem?

16 MR. MARRION: There isn't a methodology  
17 for addressing all spurious actuations in a given  
18 fire. Utilities had --

19 VICE CHAIRMAN SHACK: You can address them  
20 one at a time.

21 MR. MARRION: You can address them one at  
22 a time. And I would ask that the two utility  
23 representatives explain their methodology for circuit  
24 analysis. I think we would find that very insightful.

25 MEMBER DENNING: Good.

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1 MR. MARRION: But it's changed. And then  
2 what I would like to do is ask Dave Miskiewicz from  
3 Progress Energy and Harry Barrett from Duke Power.

4 CHAIRMAN WALLIS: I would bring up the  
5 point before you leave --

6 MR. MARRION: Yes?

7 CHAIRMAN WALLIS: You talked about the  
8 role of a generic letter and whether it just requests  
9 information. We have another generic letter on sumps,  
10 which you may be aware of, right?

11 MR. MARRION: I am generally aware of that  
12 one.

13 CHAIRMAN WALLIS: It not only requested  
14 information. It requested analysis, and it requested  
15 plans. And, in fact, it's resulted in large changes  
16 in the plant by a result of a generic letter.

17 MR. MARRION: Yes.

18 CHAIRMAN WALLIS: So it's not as if this  
19 is a unique generic letter, which is actually asking  
20 plants to do much more than just supply information.

21 MR. MARRION: My only point is a request  
22 for information as this generic letter is  
23 characterized as a mischaracterization of what its  
24 impact is.

25 CHAIRMAN WALLIS: Well, it clearly isn't

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1 that. I mean, it says a request for information and  
2 taking additional actions. I mean, the sentence asks  
3 for more than just information.

4 MR. MARRION: Okay?

5 MEMBER DENNING: Okay. Let's have our  
6 visitors come up.

7 MR. FRUMKIN: If I could add? This is Dan  
8 Frumkin. Just one point. The inspections started  
9 again in January of 2005, but there is still currently  
10 enforcement discretion for all circuit findings. And  
11 so there may be a perception that this has not turned  
12 into an issue yet because of a lack of enforcement in  
13 this area.

14 So starting in September 2006, enforcement  
15 will proceed for plants that do not have enforcement  
16 discretion under NFPA 805. So I just want to put that  
17 out there that currently there are no enforcement  
18 actions in this area for plants that take compensatory  
19 measures and have correction action plans.

20 MEMBER DENNING: Introduce yourselves,  
21 please.

22 MR. BARRETT: Good morning. My name is  
23 Harry Barrett. I work at Duke Power. I'm the  
24 three-site lead for NFPA 805 transition for all three  
25 of these sites in Duke Power's nuclear fleets. I just

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1 wanted to say a few words about the multiple spurious  
2 issue as it affects 805.

3           Although 805 is a risk-informed,  
4 performance-based rule, it is based on your current  
5 licensing basis going forward. And if that is  
6 questionable, then your regulatory foundation that  
7 you're billing it on would be questionable in 805,  
8 which ends up leading to a lot more effort and a lot  
9 more analysis required for that.

10           So this multiple spurious issue is adding  
11 a significant amount of paperwork and analysis to 805  
12 transition. The original concept was you would take  
13 your fire protection licensing basis, map it over to  
14 the 805 requirements, and it was pretty much just a  
15 paper transition.

16           With this new multiple spurious and the  
17 complications that that adds to the fire PRA, we're  
18 looking at a significant amount of engineering effort  
19 that goes into that.

20           It's going to take us over two years to do  
21 the transition for Oconee, which is the first plant.  
22 And a lot of that, most of that, is the PRA in the  
23 multiple spurious issue.

24           MEMBER APOSTOLAKIS: Do you agree that it  
25 is an issue?

1 MR. BARRETT: I agree that it needs to be  
2 looked at. I have not seen a multiple spurious  
3 scenario that is risk-significant yet.

4 MEMBER APOSTOLAKIS: Do any of your plant  
5 have a detailed fire PRA?

6 MR. BARRETT: We have a fire PRA. We have  
7 --

8 MEMBER APOSTOLAKIS: Not IPEEE, though?

9 MR. BARRETT: We had an early '80s vintage  
10 fire PRA, but we are putting together a NUREG 6850,  
11 the new version of it.

12 MEMBER APOSTOLAKIS: Okay. So --

13 MR. BARRETT: We're doing that now.

14 MEMBER APOSTOLAKIS: It would be, then,  
15 possible for you to go back to that PRA and see what  
16 happens if you assume multiple --

17 MR. BARRETT: It assumed multiple in the  
18 original analysis. To use the core melt, we needed to  
19 use multiples for that particular analysis. So it  
20 included --

21 MEMBER APOSTOLAKIS: The number came out  
22 okay?

23 MR. BARRETT: It came out relatively high.  
24 I don't remember the exact number, but fire was a  
25 fairly significant contributor to risk in the --

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1 MEMBER APOSTOLAKIS: Not fire overall,  
2 but, I mean, this particular mode with --

3 MR. BARRETT: Spurious?

4 MEMBER APOSTOLAKIS: Yes.

5 MR. BARRETT: If I remember right, many of  
6 the combinations that we analyzed were within the  
7 bounds of the Appendix R analysis originally for  
8 control room evacuation. The main fire area that we  
9 got into trouble with the IPEEE or the fire PRA, the  
10 original one, was in our cable shaft going up to the  
11 control room, where we had just about every cable in  
12 the plant going through one area. And so --

13 MEMBER APOSTOLAKIS: It seems to me that  
14 --

15 CHAIRMAN WALLIS: Did you assume multiple  
16 spurious actuations, simultaneous, and all of this?

17 MR. BARRETT: In that particular PRA, we  
18 ended up having to go to multiple spurious actuations  
19 in order to get the core damage.

20 CHAIRMAN WALLIS: Okay. Including  
21 simultaneous actuations.

22 MEMBER APOSTOLAKIS: So it would be  
23 interesting, then, to compare your numbers and  
24 analysis with the bounding analysis that the NRC staff  
25 has done to see which one makes sense.

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1 I mean, it seems that we do have a body of  
2 knowledge there that at least I as a member of this  
3 Committee don't seem to have access to. I don't know  
4 whether the rest of the members are familiar with it,  
5 but I doubt it.

6 So, I mean, it would be nice to see that,  
7 especially since you have done it already, I mean.

8 MR. BARRETT: Yes. The original analysis  
9 was nowhere the rigor that 6850 requires now.

10 MEMBER APOSTOLAKIS: I understand that.  
11 I mean, you --

12 MEMBER SIEBER: It is just one plant. So  
13 it's not clear to me how you can extend that to some  
14 --

15 MEMBER APOSTOLAKIS: Yes. But it provides  
16 a basis for judging what Ray Gallucci did.

17 MEMBER SIEBER: It gives you an idea.

18 MEMBER APOSTOLAKIS: Yes. And also what  
19 kind of effort it takes to do it because under NFPA  
20 805, it seems to me that if you find -- as I recall.  
21 Maybe I'm wrong. As I recall, you're right. You're  
22 supposed to meet the regulations, but if you don't  
23 meet some of them, then you can argue in risk space.

24 MR. BARRETT: Right.

25 MEMBER APOSTOLAKIS: Right?

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1 MR. BARRETT: Right.

2 MEMBER SIEBER: You don't need to.

3 MEMBER APOSTOLAKIS: But you don't need to  
4 go back and comply. So, I mean, there is a way out of  
5 it depending on the quality of the risk assessment.

6 MEMBER SIEBER: That would be a basis for  
7 an exemption, but you can't just sit there and do  
8 nothing.

9 MEMBER APOSTOLAKIS: But is that  
10 consistent with a statement that it does a lot of  
11 work, paperwork? I mean, if you already have the PRA,  
12 why does it add a lot of work? But you just said  
13 that, right?

14 I'm sorry. I don't remember your name.

15 MR. BARRETT: Harry.

16 MEMBER SIEBER: The PRA is not  
17 state-of-the-art.

18 MR. BARRETT: Right. The original PRA is  
19 not state-of-the-art.

20 MEMBER SIEBER: They have to do the work.

21 MR. BARRETT: The one that they are doing  
22 now is state-of-the-art. They're using 6850 and --

23 MEMBER APOSTOLAKIS: When do you expect it  
24 to be completed?

25 MR. BARRETT: It should be complete by

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1 probably June of next year.

2 VICE CHAIRMAN SHACK: When you do your  
3 state-of-the-art PRA, you're going to consider  
4 multiple actuations, right?

5 MR. BARRETT: Yes.

6 MEMBER APOSTOLAKIS: Yes. So, I mean, is  
7 it clear to everyone? I mean --

8 MR. BARRETT: We are taking significant  
9 efforts to make sure we get our best chance at finding  
10 those multiple spurious risk --

11 VICE CHAIRMAN SHACK: But it seems to me  
12 that anybody doing a fire PRA is going to have to  
13 consider multiple --

14 MEMBER DENNING: Do they have to consider  
15 them as comprehensively as here? Because they will  
16 have screening criteria. And I guess can you tell me  
17 if you weren't -- you know, suppose you were not  
18 heading towards that.

19 If you are sitting there and you had to do  
20 this analysis, how long would it take you to do this  
21 analysis? And how difficult would it be to -- would  
22 you have to modify the plant to be able to accommodate  
23 it?

24 MR. BARRETT: I am not sure about that.  
25 What we would probably end up doing is using the

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1 guidance in NEI-0001, chapter 4, which is the risk  
2 analysis piece of that, which is, in essence, doing a  
3 mini PRA for the --

4 MEMBER DENNING: But you're not allowed to  
5 use that. I mean, by this generic letter, you're only  
6 allowed to do that if you're then going to look for  
7 exemptions.

8 MR. BARRETT: Right, yes. You're not  
9 doing 805. That's your only other --

10 MEMBER DENNING: Yes.

11 MR. BARRETT: I mean, you need to modify  
12 the plant or you --

13 MEMBER DENNING: Modify the plant. How  
14 long would it take you to do that analysis in --

15 MR. BARRETT: Guessing, I would say  
16 probably a year.

17 MEMBER DENNING: Probably a year. I mean,  
18 what is in here says 90 days.

19 MR. BARRETT: No way.

20 MEMBER DENNING: There's no way?

21 MR. BARRETT: No way.

22 MEMBER DENNING: You would think that --

23 MEMBER SIEBER: Well, you can tell in 90  
24 days roughly how long you think it's going to take you  
25 to do it.

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1 MEMBER DENNING: Absolutely.

2 MEMBER SIEBER: But that's not what  
3 they're asking.

4 MEMBER DENNING: But that's not what  
5 they're asking.

6 MR. BARRETT: I mean, your choices are to  
7 take your safe shutdown analysis and just say that  
8 everything in a given fire areas fails immediately.

9 MEMBER SIEBER: That is the way you used  
10 to do it.

11 MR. BARRETT: And you can't do it.

12 MEMBER SIEBER: No.

13 MR. BARRETT: I mean, with the acceptance  
14 criteria you have in Appendix R, having water level go  
15 out of the pressurizer, you can do that with just a  
16 couple of spurious actuations. If you do all of them,  
17 you're never going to make it. So I don't know how  
18 you do that in 90 days.

19 MR. WOLFGANG: This is Bob Wolfgang with  
20 again --

21 MEMBER DENNING: Go ahead, Bob.

22 MR. WOLFGANG: The 90 days, what we have  
23 currently in the generic letter is for functionality  
24 assessment. To submit any exemption requests,  
25 amendment requests, that's the six-month period.

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1 MEMBER DENNING: Yes, but what I am  
2 missing is to do the functionality assessment, don't  
3 you have to do basically the analysis?

4 MR. BARRETT: Yes. That is essentially an  
5 operability assessment. Are components operable? In  
6 order to know that, you have to do the analysis to  
7 know what gets damaged and when. There's no way  
8 you're going to do that in a short time, no way.

9 MEMBER DENNING: Dave, did you want to  
10 make some comments?

11 MEMBER SIEBER: Before we switch, one  
12 thing that you said that I think is important is you  
13 really can't get the core damage unless you have  
14 multiple spurious actuations.

15 MR. BARRETT: We have some singles that  
16 get us in trouble, and we're going to have to fix  
17 those. But as far as getting into the core damage,  
18 I'm not even sure --

19 MEMBER SIEBER: This would be opposing  
20 trains, too, right?

21 MR. BARRETT: Well --

22 MEMBER SIEBER: Train A, train B pairs.

23 MR. BARRETT: By the fire PRA methodology,  
24 you're really not even worrying about 3G2 or 3G3  
25 anymore. You're looking at fires anywhere and damage

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1 to all of the circuits.

2 MEMBER SIEBER: Right.

3 MR. BARRETT: So you're really looking at  
4 controlling fires and cable room fires and all of  
5 that. And, you know --

6 MEMBER SIEBER: But if you were to make  
7 the assumption that you only have one spurious  
8 actuation, you wouldn't get the core damage. And you  
9 could just say, "I don't need to do anything," right?

10 MEMBER APOSTOLAKIS: Well, it depends on  
11 what else fails.

12 MR. BARRETT: Yes. I think it depends  
13 largely on --

14 MEMBER SIEBER: It would be an on-fire --

15 MR. BARRETT: -- what other failures --

16 MEMBER SIEBER: -- a non-fire-induced  
17 failure, right?

18 MEMBER DENNING: There has to be a core  
19 damage frequency, though. I mean, when you said you  
20 wouldn't get core damage frequency with a single  
21 failure, you have to because you have other unrelated,  
22 but it's just very low.

23 MR. BARRETT: Also we are talking hot  
24 shorts here, but you also have fire-related damage,  
25 which takes the component out of service, which is not

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1 included in that spurious operation probability.

2 So it's a much more complicated things to  
3 get your arms around as far as loss of all electrical  
4 power, loss of indication, and all of that. It's more  
5 than that.

6 MEMBER DENNING: Yes?

7 MEMBER SIEBER: Thanks.

8 MEMBER DENNING: Dave?

9 MR. WOLFGANG: Excuse me.

10 MEMBER DENNING: Yes?

11 MR. WOLFGANG: This is Bob Wolfgang again.

12 So Duke's response to this generic letter  
13 would be we're addressing it. We're transition to  
14 NFPA 805. And we're going to address multiple  
15 spurious actuations in that transition.

16 MR. BARRETT: Yes, sir.

17 MR. WOLFGANG: And that is the total  
18 response we're looking for from --

19 MR. BARRETT: We will give you a schedule  
20 of when we think that will be done, yes.

21 MEMBER DENNING: Okay. If that is what  
22 you are asking for, you're going to have to change the  
23 generic letter.

24 MR. BARRETT: No.

25 MEMBER DENNING: My interpretation. Well,

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1 we'll look at that.

2 Dave, why don't you go ahead and say a few  
3 words?

4 MR. MISKIEWICZ: Okay. My name is Dave  
5 Miskiewicz. I'm from Progress Energy. I'm the lead  
6 PRA supporting the transition to 805 at all of our  
7 units.

8 MEMBER APOSTOLAKIS: PRA?

9 MR. MISKIEWICZ: I'm the lead PRA engineer  
10 supporting our transition.

11 MEMBER APOSTOLAKIS: I thought you said  
12 "elite."

13 (Laughter.)

14 MR. MISKIEWICZ: That does sound good.

15 A lot of the discussion I'm hearing, my  
16 perspective is probably a little bit different than  
17 the normal compliance.

18 MEMBER APOSTOLAKIS: That's why we want  
19 it.

20 MR. MISKIEWICZ: You know, there is  
21 uncertainty. And I am used to dealing with the  
22 uncertainty as how much probability I can assign to  
23 something, can I take credit for these actions and all  
24 the various things on there.

25 One of the things that strikes me is when

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1 I look at the bounding analysis and it seems like  
2 we're trying to get the best of both worlds. We want  
3 to address everything in totality and also assure that  
4 we don't have that risk.

5 You know, when I deal with traditional  
6 design basis, we are allowed one single failure. And  
7 we assume no off-site power. And we give an  
8 initiating event that happens, and that is a given.

9 PRA, we will look at multiple failures.  
10 And we may find things that are more vulnerable that  
11 weren't even addressed under compliance. And I see  
12 kind of a similar thing here except for instead of  
13 saying, "Address a single failure," we're looking at  
14 "You've got to find them all."

15 And that just seems like an impossible  
16 task. Even in the PRA world, we can model a lot of  
17 stuff, but we're still not going to get them all. But  
18 we try to find the significant things. We're trying  
19 to gear down to get the significant issues.

20 As far as the workload goes that I see on  
21 the generic letter, I think it would be significant.  
22 I'm not the circuit analysis person but when I start  
23 throwing in non-currently credited equipment into that  
24 list that I want circuits routed for and cables routed  
25 for, it is a big workload for the electrical guys who

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1 are going to be doing that work. And I would see that  
2 as a resource drain on the overall transition effort  
3 for me.

4 In fact, if I saw them, you know, all of  
5 a sudden, focusing on one area and not another area,  
6 I'm not even sure how they would be able to get all of  
7 them without doing the PRA perspective.

8 MEMBER APOSTOLAKIS: I am a little bit --  
9 I don't know what the right word is, but we keep  
10 talking about the workload. It seems to me we should  
11 be talking about the real issue.

12 Is there a real issue here? Is there a  
13 contributor to risk that we have not handled in the  
14 past or managed well? I mean, the workload I'm sure  
15 you will agree, too, it's a major contributor to risk.  
16 We have to do something about it.

17 MR. MISKIEWICZ: I agree.

18 MEMBER APOSTOLAKIS: And, you know, the  
19 thing that made me happy with Duke is that they are  
20 doing the PRA. They will consider the multiple hot  
21 shorts or spurious situations. Is your company doing  
22 something similar or --

23 MR. MISKIEWICZ: We are doing the PRA.  
24 And we're going to in the PRA model the hot shorts,  
25 the spurious actuations.

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1 MEMBER APOSTOLAKIS: According to the  
2 latest information we have and everything?

3 MR. MISKIEWICZ: When we say important,  
4 too, it's almost, you know --

5 MEMBER APOSTOLAKIS: You're not going to  
6 use .1? You're going to use .6, for example?

7 MR. MISKIEWICZ: We'll use whatever the  
8 methodology recommends.

9 MEMBER BONACA: You can go to Professor  
10 Apostolakis if you remember.

11 MEMBER APOSTOLAKIS: Give me a call. I'll  
12 tell you.

13 (Laughter.)

14 MR. MISKIEWICZ: It's .1. And we're  
15 working through those issues, but even doing that is  
16 going to be limited somewhat. You know, there are  
17 screening techniques and things used that we're going  
18 to work our way through as to which circuits really  
19 need to be evaluated.

20 MEMBER DENNING: Do you think the approach  
21 is clearly defined as to how you come up with a  
22 probability for these actuations?

23 MR. MISKIEWICZ: Right.

24 MEMBER DENNING: There is some randomness  
25 that one assumes in terms of which circuits can

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1 connect with which other circuits to --

2 MR. MISKIEWICZ: I think what we know now  
3 is better than what we knew ten years ago when we were  
4 dealing with this.

5 MEMBER DENNING: Yes. But it isn't  
6 obvious to me even what the best approach is to doing  
7 that within the fire PRA, let alone deterministically.

8 MEMBER APOSTOLAKIS: So the position,  
9 then, of at least you two gentlemen and maybe the  
10 industry is that this generic letter is unnecessary,  
11 that you are handling the issue of multiple spurious  
12 actuations via the PRA and as you transition to it --  
13 are you transitioning to 805?

14 MR. MISKIEWICZ: Yes, we are.

15 MEMBER APOSTOLAKIS: As you transition to  
16 805, you may have to come back to the NRC and, using  
17 risk arguments, request an exemption of some sort. Is  
18 that your position?

19 MEMBER BONACA: Well, I heard it  
20 differently.

21 MEMBER APOSTOLAKIS: What?

22 MEMBER BONACA: I heard it differently.  
23 I heard simply that the burden should be on the NRC to  
24 perform. Okay.

25 MEMBER APOSTOLAKIS: But they are handling

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1 it already.

2 MEMBER BONACA: Yes.

3 MR. BARRETT: We are handling multiple  
4 spurious in the PRA as part of the 805 transition.

5 MEMBER APOSTOLAKIS: And then what?

6 MR. BARRETT: And then we're going to  
7 follow the industry guidance and the regulatory  
8 guidance provided by the NRC. And depending upon  
9 where the thresholds fall in relation to the  
10 self-approval thresholds, if it's less than the  
11 self-approval threshold, then we'll end up  
12 self-approving an exemption in accordance with the NRC  
13 rules for 805 implementation.

14 MEMBER APOSTOLAKIS: Right, right.

15 MR. BARRETT: If it's over that threshold,  
16 then we'll end up having to --

17 MEMBER APOSTOLAKIS: Come back.

18 MR. BARRETT: -- contact the staff and  
19 work out whether we have to modify or whether we can  
20 leave the situation as is.

21 MEMBER APOSTOLAKIS: The conclusion one  
22 can draw from this is that you believe that this  
23 generic letter is unnecessary because there is already  
24 a process in place. Is that correct?

25 MR. BARRETT: For 805, for their plants.

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1 Not everyone is --

2 MEMBER APOSTOLAKIS: Why wouldn't another  
3 plant apply the same thing?

4 MEMBER SIEBER: It is an optional process.  
5 Some plants --

6 MEMBER APOSTOLAKIS: Oh, they don't --

7 MEMBER SIEBER: -- may decide not to do  
8 anything at all.

9 MEMBER APOSTOLAKIS: If they don't  
10 transition to 805, you mean?

11 MEMBER SIEBER: Yes.

12 MR. MARRION: If I may, Dr. Apostolakis,  
13 there are 40 plants that have submitted letters of  
14 intent to the NRC. The resolution of this issue for  
15 the 805 plans has yet to be determined. The approach  
16 is the use of the PRA, do the modeling -- all right?  
17 -- and then define that.

18 But that would be applicable to those 40  
19 plants. The other plants, the balance of the  
20 industry, have used any combination of the single  
21 failure to three or four failures.

22 You heard mention of NEI-001 that has the  
23 methodology, both -- two methodologies: deterministic  
24 and risk-informed. We piloted that at two plants.

25 And so we can't take credit for that

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1 anymore because of this new position with the generic  
2 letter. But I suspect that the solution will be had  
3 with the pilot exercise over the next several months  
4 to a year possibly and that that's the solution that  
5 needs to be evaluated for applicability to the non-805  
6 plants because, absent that, I don't see anyone coming  
7 up with a generic solution for the non-805 plants  
8 today. And it is going to be based upon PRA.

9 MR. MISKIEWICZ: Even in 805, though, when  
10 we do a fire PRA, there will be some iterative  
11 process. You know, we're dependent on the circuit  
12 analysis people giving us the information that we need  
13 to model. And so we're going to try to get risk to  
14 make sure we're modeling the right areas.

15 MEMBER SIEBER: Just the basic methodology  
16 of PRAs causes you to consider multiple spurious --

17 MR. MISKIEWICZ: If you model all of your  
18 singles and multiples from singles --

19 MEMBER SIEBER: That's the way it is.

20 MEMBER APOSTOLAKIS: But in the old days,  
21 in the first PRAs, I don't think we considered that.

22 MR. MISKIEWICZ: You modeled your singles.  
23 And they would combine in your results to give you  
24 multiples.

25 MEMBER SIEBER: Part of the process.

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1 MR. MISKIEWICZ: Yes. But you would still  
2 have to model the spurious event was a failure mode  
3 for that specific piece of equipment, --

4 MEMBER SIEBER: Right.

5 MR. MISKIEWICZ: -- which depends on the  
6 circuit analysis people telling you where that --

7 MEMBER SIEBER: So the philosophical  
8 discussion as to what the assumptions ought to be is  
9 sort of moot because the process of the PRA itself  
10 takes care of that if it's done thoroughly and done  
11 right.

12 MEMBER APOSTOLAKIS: One of the things  
13 that we don't do at this Committee is have  
14 presentations or briefings on the actual analysis that  
15 the industry is doing.

16 MEMBER SIEBER: Right.

17 MEMBER APOSTOLAKIS: I think that would be  
18 extremely beneficial to us if somehow we found a way  
19 to have the industry come and present a detailed PRA,  
20 fire PRA in this case. Anyway, that's a separate  
21 issue.

22 MEMBER DENNING: I think what we would  
23 like to do at this point is thank you gentlemen. And  
24 we may still ask you in the few minutes that we have  
25 left if we have some additional questions. We have

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1 the potential to hear about additional experimental  
2 work that could potentially change some perspectives,  
3 but I don't think we'll do that.

4 I think what we ought to do now is we  
5 would have some discussion while we still have the  
6 staff here and the industry here, we have some  
7 discussion? Would you agree, Graham, that we'll have  
8 some discussion here, see just kind of where we are  
9 sitting on this?

10 CHAIRMAN WALLIS: I was thinking about  
11 that. I think we certainly need discussion.

12 MEMBER SIEBER: Yes.

13 CHAIRMAN WALLIS: I think some of it needs  
14 to be in our working session, --

15 MEMBER DENNING: Yes.

16 CHAIRMAN WALLIS: -- rather than open  
17 session, but I think we can do some of it now. What  
18 little bit we can do now to clarify the situation  
19 certainly we should do now.

20 MEMBER ARMIJO: I have a question that may  
21 not be a discussion. Just in reading the staff's  
22 response to a lot of the comments received on the  
23 draft, there was reference to a lot of -- where is  
24 this thing, the screening tool, a risk screening tool,  
25 that the licensees develop a risk screening tool to be

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1 reviewed and approved by the staff.

2 This is a tool that would evaluate a  
3 variety of different multiple spurious actuations and  
4 sort them out and say, "These are the ones to worry  
5 about. And the rest we don't have to worry about."

6 What is your view? Does such a tool  
7 exist? Do you use such tools, both parties?

8 MR. MISKIEWICZ: We haven't kind of gotten  
9 to that step yet. I'm not exactly sure what the  
10 paragraph is you are referring to.

11 MEMBER ARMIJO: Yes. It's --

12 MR. MISKIEWICZ: But we can do  
13 sensitivities and say, "If I just fail the system, you  
14 know, a functional type of thing, if it's not  
15 significant, then I don't have to go down deeper and  
16 model all the individual spurious. I can screen it by  
17 saying it's not going to matter without doing the  
18 detailed modeling," you know.

19 MEMBER APOSTOLAKIS: The screening depends  
20 on a number of factors, this being one, but the other  
21 is the amount of fuel you have in your area, whether  
22 you can have a fire to begin with, the fire PRA.

23 MEMBER ARMIJO: I thought it was here is  
24 a large number of conductors that can cause spurious  
25 actuations of a large number of systems. And nobody

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1 has defined what scenarios are worrisome. It seems to  
2 me like it's a large number of mind-boggling barriers.  
3 And how do you sort those all?

4 MR. BARRETT: Let me address that.

5 MEMBER ARMIJO: Yes.

6 MR. BARRETT: One of the things that Duke  
7 has done -- and I think Progress is going to follow  
8 suit when they actually do their PRA -- is we have  
9 attempted to put our arms around the most significant  
10 multiples that we could think of by putting together  
11 an expert panel of people who know the plant, know the  
12 Appendix R design, no fire protection, and postulate  
13 these in an organized fashion, like going through  
14 PNIDs and plant design records to say, "All right.  
15 What are the real multiple spurious combinations that  
16 would really hurt me?" and capture those in scenarios  
17 so that they can be analyzed in detail in the fire PRA  
18 so that we can really look at the risk.

19 We're looking at it taking a three-pronged  
20 approach. We have the Appendix R analysis that says,  
21 "Here is all the safe shutdown stuff that I've got to  
22 have. Here are the cables and where they go in the  
23 plant. And then here is what gets damaged in each  
24 fire area."

25 And we take the expert panel. And we say,

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1 "Well, is there anything we missed? You know, is  
2 there something out there that because you end up  
3 flushing the toilet over here and you end up turning  
4 that light bulb on, the combination of things gets you  
5 something you didn't expect?" The expert panel is  
6 supposed to deal with that.

7 And then we also look at the PRA and true  
8 up all AOVs, true up all MOVs, and see if those kinds  
9 of things give us surprises that we didn't expect.  
10 Between the three of those, we think we're going to  
11 end up probably having 95 percent of the  
12 risk-significant scenarios.

13 MEMBER DENNING: For all of your plants,  
14 do you know where your cables are by tray?

15 MR. BARRETT: We didn't. We ended up  
16 having to pay to have that analysis done for us. I  
17 think it was originally determined in the '80s but was  
18 not captured in a database or anything. And we had to  
19 go back and --

20 MEMBER DENNING: But you had that for all  
21 your plants, do you?

22 MR. MISKIEWICZ: I wouldn't say all of the  
23 plants. That's a lot of work. In a lot of cases it's  
24 limited to the set of equipment that met the rule for  
25 the Appendix R compliance --

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1 MEMBER DENNING: It seems to say that --

2 MR. MISKIEWICZ: -- or our equipment that  
3 we want to credit from PRA perspective because there  
4 is risk-significant equipment in mitigation that is  
5 not within the scope of Appendix R right now. And  
6 that we'll add to the list. And some of those still  
7 need to be routed.

8 MEMBER DENNING: You do have additional  
9 cable routing that you would have to determine;  
10 whereas, you feel that you have already done the --

11 MR. BARRETT: There were some things in  
12 the PRA that we had not addressed in safe shutdown,  
13 and we're going to have to have --

14 MEMBER DENNING: Well, PRA is one thing.  
15 What about with this requirement? Does that change?  
16 Would you have to -- if this was imposed on you, do  
17 you think you have to do more cable tracing?

18 MR. BARRETT: What I'm talking about is  
19 our attempt to try to get our arms around all of the  
20 risk-significant scenarios.

21 MEMBER DENNING: Scenarios? Okay.

22 MR. BARRETT: So that's why we did the  
23 expert panel and all of that, to try to get our arms  
24 around things that we would have otherwise missed.

25 MEMBER DENNING: You keep saying

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1 "risk-significant." And we're in a space here where  
2 we're not necessarily risk-significant. It's broader  
3 than that.

4 MR. BARRETT: I think if you take all of  
5 the cables and you just fail them all and you say they  
6 all happen immediately, you're done.

7 MEMBER DENNING: You can't survive.

8 MR. BARRETT: Some of these areas you  
9 can't survive it.

10 MEMBER DENNING: Okay.

11 MEMBER SIEBER: On the other hand, from a  
12 risk standpoint, the set of cables that you have to  
13 know what the routing is becomes larger than the  
14 Appendix R set.

15 MR. BARRETT: Yes.

16 MEMBER SIEBER: But it is certainly not  
17 all of the cables. So there is going to be some  
18 physical work that has to be done if you don't have  
19 pull ticket. If you don't have the database, you  
20 can't --

21 VICE CHAIRMAN SHACK: In the NEI-001  
22 guidance, where, as I understand it, you do up to four  
23 failures, how do you select those four?

24 MR. BARRETT: A similar process with the  
25 expert panel and using Appendix R analysis, a similar

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1 process.

2 MR. FRUMKIN: This is Dan Frumkin from the  
3 staff.

4 One of the things that we have discovered  
5 about defining a failure is a lot of the analyses  
6 assume once spurious actuation, once spurious  
7 actuation, what the NEI or at least the risk, 2,403 --  
8 and I think NEI-001. They talk about multiple hot  
9 shorts.

10 Now, one pair of conductors coming  
11 together could cause numerous different spurious  
12 actuations. So I think that the staff and the --  
13 well, the staff has come out with 2,403 and has put it  
14 on the table.

15 We are looking for this hot short. That  
16 could cause whatever it could cause. We're not  
17 counting spurious actuations anymore. We're taking  
18 that hot short and saying, "Well, what could it  
19 cause?"

20 I think there was a situation where there  
21 was one cable or just a number, just a few conductors,  
22 or maybe it was even two conductors that could give an  
23 indication which could open all of 16 SRVs at one  
24 plant.

25 Now, a long time ago that might have been

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1 16 separate spurious actuations. And today we're  
2 looking at that as one pair of conductors coming  
3 together. And I think everybody is pretty much on the  
4 same page that yes, obviously if the circuits can  
5 cause all of those spurious actuations, we consider  
6 that.

7 MEMBER DENNING: Well, I guess a comment  
8 that I would have on generally what I have heard is  
9 that I think it's very clear that there are timing  
10 issues. If we go forward with the generic letter,  
11 then, at least in my interpretation of the generic  
12 letter, there are timing requirements that are not  
13 doable by the industry and that one would have to do  
14 some relaxation of that. And I don't see where just  
15 having the 30-day, where they can say, "It's going to  
16 take me longer as appropriate."

17 Now, it could be that maybe this should be  
18 more of an information-gathering generic letter,  
19 rather than one that is quite forcing the NRC's  
20 position about the need for multiple spurious  
21 actuations without a more relaxed position like NEI's.

22 I guess what I'm looking for are general  
23 comments as to people, where they are seemingly  
24 falling on this generic letter.

25 MEMBER MAYNARD: Well, I would agree with

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1 most of your comments there. First of all, I do  
2 believe that it clearly constitutes a backfit. We  
3 will get into some other things later on that, but we  
4 don't have to change regulations to be changing  
5 requirements. A change in staff position on what is  
6 acceptable for meeting a regulation, changing those  
7 position, also constitutes a backfit.

8 With that said, I would also like to say  
9 that this issue needs to be resolved. I think playing  
10 around too long about what is the right regulatory  
11 process isn't going to serve everybody's best interest  
12 either.

13 I think it is important. This issue has  
14 been around for 25 years. It needs to get resolved in  
15 an approach going forward as to what is it going to  
16 take to either make it go away as an issue or to  
17 actually fix it.

18 I think the 90 days, I think basically if  
19 it goes out the way it is, basically you're going to  
20 end up with everybody coming in with time request  
21 extensions. And so I don't think that's really the  
22 right thing to do there.

23 If it goes out the way it is, I think it  
24 needs to extend that time. I think it might be better  
25 to go out with what is truly an information request,

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1 to gather information to then be able to determine  
2 what the next steps are.

3 But, again, I don't think process should  
4 drag out for another 5 or 10 or 15, 20 years.  
5 Something needs to be done to put it on a resolution  
6 path.

7 VICE CHAIRMAN SHACK: Let me just come  
8 back to that for a second. I mean, we know what you  
9 expect from the 40 plants that are going for NFPA 805.  
10 What do you expect from the others?

11 MR. WOLFGANG: This is Bob Wolfgang again.

12 I think a number of them are going to come  
13 back and say, "We meet our licensing basis, and thank  
14 you very much. And good-bye."

15 MEMBER DENNING: Will they really say  
16 that? I mean, your --

17 MR. WOLFGANG: That is one thing.

18 VICE CHAIRMAN SHACK: Will you accept that  
19 answer?

20 MEMBER SIEBER: Send it over to  
21 enforcement.

22 MR. WOLFGANG: No. No, we won't. What we  
23 will hear from others is --

24 VICE CHAIRMAN SHACK: What would you  
25 consider an acceptable response from the others?

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1 MR. WOLFGANG: Well, "We don't address  
2 multiple spurious actuations. Here is our plan to  
3 address it to do" X, Y, Z. I don't know. "Do  
4 physical mods."

5 MEMBER DENNING: That's a six months'  
6 answer.

7 MR. WOLFGANG: Yes. That will be the  
8 six-month answer. But initially, yes, either you meet  
9 it or you don't meet it. We don't think we meet it.  
10 We think we meet it.

11 For the first round, that's all I think  
12 we're going to get.

13 MEMBER DENNING: Getting back to this  
14 backfit question, I'm not sure that ACRS is the  
15 appropriate one to answer that. Obviously it makes it  
16 easier for the regulatory staff if it's not a backfit  
17 question.

18 MEMBER BONACA: Yes. One thing that  
19 troubles me a little bit is, you know, is it a  
20 significant issue or is it not a significant issue?  
21 That's a plant-specific answer. And so we're not  
22 going to find out an answer to the question.

23 And I think that if we had to perform a  
24 generic evaluation to justify a backfit, I'm not sure  
25 that it could be done because, I mean, it's so

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1 specific to the plant, the age, to whatever the  
2 situation may be.

3 MEMBER DENNING: But this question of a  
4 specific issue, I think you can do a reduced analysis  
5 to determine. I think you can screen out stuff a  
6 priori --

7 MEMBER BONACA: I think so, too.

8 MEMBER DENNING: -- you know, so that it  
9 isn't such an onerous job to determine what's  
10 important and what's a potentially significant risk  
11 contributor here.

12 MEMBER BONACA: Clearly, I mean, something  
13 has to be done. I mean, we have new evidence in front  
14 of us. And I completely agree with you, Otto, that it  
15 can't wait. They have to be dealt with.

16 I think that, however, the industry needs  
17 more time to deal with this. They don't have a  
18 ready-made process by which they can screen this out  
19 and address it. So the issue is more the time.

20 Now, the next statement again, as reported  
21 to you, is the fact that we are not really the best  
22 charges of what is the most appropriate regulatory  
23 process to follow to go ahead with this.

24 MEMBER APOSTOLAKIS: Our job here is to  
25 judge the generic letter as presented to us.

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1 MEMBER BONACA: Yes.

2 CHAIRMAN WALLIS: I am just wondering how  
3 we add value to this. If we were a subcommittee, we  
4 might well say, "Look, we now know what the issues  
5 are. We think there must be a better way than having  
6 the agency send out this generic letter asking for  
7 things which may be impractical for some plants," but,  
8 then, there should be some way to work with the plants  
9 to figure out what is the right solution to this  
10 technical problem. I'm not sure.

11 We're also sort of a facilitator between  
12 industry and the agency, and that's not really our  
13 job, though, is it?

14 MEMBER SIEBER: Well, the other thing that  
15 is not our job is to try to figure out whether it's a  
16 backfit or not. That's a legal question.

17 CHAIRMAN WALLIS: Well, we don't even know  
18 how important it is because we don't have these proper  
19 risk analyses.

20 MEMBER DENNING: Well, having resolved  
21 these questions, I now turn it back to you, Mr.  
22 Chairman.

23 (Laughter.)

24 CHAIRMAN WALLIS: I can make a very  
25 decision, which is to take a break for lunch. We are

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1 going to be ethics-trained at 12:15. And then we go  
2 to work again at 1:30. Thank you very much for your  
3 presentations.

4 We'll take a break, and as a Committee,  
5 we're going to be back here, not on the transcripts or  
6 anything, for ethics training at 12:15. We'll start  
7 the official proceedings again at 1:30.

8 (Whereupon, a luncheon recess was taken  
9 at 11:33 a.m.)

A-F-T-E-R-N-O-O-N S-E-S-S-I-O-N

(1:33 p.m.)

CHAIRMAN WALLIS: Back into session. The next item on the agenda is another generic letter; first of all, underground cable failures that disable accident mitigation systems.

Our cognizant member is Mario Bonaca. I will hand over the meeting to him. Please go ahead, Mario.

MEMBER BONACA: Thank you, Mr. Chairman.

3) DRAFT FINAL GENERIC LETTER 2006-XX,

"INACCESSIBLE OR UNDERGROUND CABLE FAILURES THAT  
DISABLE ACCIDENT MITIGATION SYSTEMS"

3.1) REMARKS BY THE SUBCOMMITTEE CHAIRMAN

MEMBER BONACA: We have a presentation from the staff. They are proposing to issue a generic letter on inaccessible underground cable failures that disable accident mitigation systems.

We have recently become conversant with this issue through license renewal. You may remember that the GALL report requires for license renewal the existence of two programs: one, a program to detect the presence of water and the watering actions; and the other one is a program to test the cables and essentially-- so we are aware of the concern here.

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1 And the staff is now addressing this issue in the  
2 current licensing area.

3 And so, with that, I will turn to the  
4 staff. Mr. Mayfield?

5 3.2) BRIEFING BY AND DISCUSSIONS WITH  
6 REPRESENTATIVES OF THE NRC STAFF

7 MR. MAYFIELD: Good afternoon. I'm Mike  
8 Mayfield, the Director of the Division of Engineering.  
9 And my division is sponsoring this generic letter.

10 We're here this afternoon to seek ACRS  
11 endorsement to publish the generic letter. The  
12 generic letter, as Mr. Koshy will describe, provides  
13 some information to licensees on the significance of  
14 these potential failures, and seeks some information  
15 from licensees regarding the monitoring of these  
16 cables.

17 Tom Koshy from the Electrical Engineering  
18 Branch will make the presentation.

19 MR. KOSHY: Thank you, Mike.

20 As Dr. Bonaca mentioned to you, this was  
21 first brought to your attention as a problem during  
22 the license renewal hearing at the ACRS. The question  
23 was, is dewatering every ten years going to prevent  
24 the problem?

25 At that time, in light of the failures

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1 that we had noticed at the time, we thought of taking  
2 it as an operating reactor issue under Part 50. And  
3 we did some serious looking into see how big the  
4 problems are.

5 The safety concerns identified at the time  
6 were some of these underground and inaccessible cables  
7 supply power to some safety-related components. Using  
8 some examples here, the off-site power, the cable that  
9 brings the off-site power, to the safety buses.

10 The second would be the emergency diesel  
11 generator feeder. This is critical in those cases  
12 where the emergency diesel generator to building is  
13 physical apart from the main building so that the  
14 underground cables bring into power; and then the  
15 emergency service water pumps, these cases where the  
16 pump house is located again, you know, physically away  
17 from the plant so that the power supply to the service  
18 water pump has to go through underground cables.

19 And failure of one of these cables could  
20 affect multiple systems in these sense there could be  
21 a train, cooling off of safety systems, collectively  
22 influencing more than just one isolated system.

23 Most of these failures that we came across  
24 did not have any direct reference to having a  
25 qualification for this cable to withstand the moisture

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1 environment or, essentially, you know, in duct banks,  
2 if it is immersed in water, you know, can it  
3 withstand. That type of qualification had not been in  
4 existence for these cables that we came across.

5 MEMBER BONACA: Let me understand now,  
6 however. These are cables in safety-related  
7 applications?

8 MR. KOSHY: Yes.

9 MEMBER BONACA: Okay. So evidently on day  
10 one, when the plant was built, there was no  
11 expectation that the cable would be wetted?

12 MR. KOSHY: Yes. In fact, they thought it  
13 would stay relatively dry, but as duct banks develop  
14 cracks, you know, there would be traffic about it.  
15 And eventually these things crack. And depending on  
16 the water table, you know, it could be immersed for a  
17 long time or maybe a short time.

18 MEMBER BONACA: Well, in many cases, these  
19 cables are buried --

20 MR. KOSHY: Yes.

21 MEMBER BONACA: -- in the ground. So from  
22 day one, there was an expectation that they would see  
23 humidity and why we are not environmentally qualified.

24 MR. KOSHY: Either it was not specified at  
25 the time or they thought that, you know, the existing

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1 material at the time could withstand some level of  
2 moisture. For some reason, they did not specifically  
3 seek out.

4 The reason I stated that is, you know,  
5 much in the later period, now we have cables that can  
6 withstand such highly moist environment. In fact, I  
7 know of a case where they have run the cable to the  
8 river. That's for a --

9 CHAIRMAN WALLIS: But not forever.

10 MR. KOSHY: Excuse me?

11 CHAIRMAN WALLIS: Just because they are  
12 qualified doesn't mean they will survive forever in  
13 this environment.

14 MR. KOSHY: You are right, yes. Yes.  
15 They may not survive forever, but at least, you know,  
16 they have some demonstrated capability for a certain  
17 period that it can be even immersed in water and still  
18 do its function.

19 But all of that addresses, you know, the  
20 possibility that you need to know the condition of the  
21 insulation so that you have that confidence that it  
22 can do its function for the foreseeable future.

23 We went back into the history of the LERs  
24 that we have on record. We saw failure at 17 sites  
25 and cable replacements at 100 or so. And most of the

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1 faulty cables were not discovered until there was an  
2 operational failure.

3 Again, these are based on LERs, where the  
4 system has a redundant system or some reason, because  
5 of a plant trip or the failure was serious enough it  
6 prompted an LER.

7 MEMBER ARMIJO: What is your definition of  
8 a medium cable?

9 MR. KOSHY: 5 kV.

10 MEMBER ARMIJO: And above?

11 MR. KOSHY: 5 kV. Well, in the sense of  
12 when you go into 13 kV, you know, some people label it  
13 as medium also.

14 MEMBER ARMIJO: Okay.

15 CHAIRMAN WALLIS: High tension.

16 MEMBER SIEBER: Four-eighty volts to --

17 MR. KOSHY: Four-eighty will be below  
18 that. Yes. We will not call that medium, yes.

19 MEMBER SIEBER: Four-eighty is --

20 MEMBER BONACA: But you include those?

21 MR. KOSHY: Excuse me?

22 MEMBER BONACA: But you include those in  
23 the --

24 MR. KOSHY: Yes, we are including those  
25 because there are certain plants where the emergency

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1 diesel generator generates voltage at 480 and  
2 emergency service water and safety pumps are at 480  
3 volts, some small plants and early vintage.

4 MEMBER BONACA: Okay.

5 MR. KOSHY: So we wanted to include that  
6 also. That's why we went more than just medium  
7 voltage.

8 The EPRI data indicated about 65 cable  
9 failures. And later the white paper which NEI has  
10 submitted indicated about 55 failures for about 15  
11 plants.

12 Most of the cable failures have what in  
13 common? It's about 12 years of age. And the cable  
14 was subjected to some type of, you know, moisture  
15 environment, probably for a longer duration or a  
16 shorter duration. And these things were essentially  
17 common factors.

18 The cables, again, that we are focusing on  
19 is about roughly about six to eight cables, you know,  
20 depending on the design uniqueness, the cables that  
21 can have the most, let's say, significant impact on  
22 the plant.

23 MEMBER MAYNARD: The cable was about 12  
24 years old? You're saying that all of these failures  
25 were about the same age or --

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1 MR. KOSHY: No. More than that. There  
2 are some 20-plus.

3 MEMBER MAYNARD: Okay. All right.

4 MR. KOSHY: Yes.

5 CHAIRMAN WALLIS: It was at least 12 years  
6 old. At least 12 years. I was trying to figure it  
7 out. If it's every 12 years, that's pretty severe.

8 MR. KOSHY: You're right. Twelve and  
9 above. So in this generic letter, what we are  
10 focusing on is power cables that are within the scope  
11 of the maintenance rule, including cables connected to  
12 off-site power, emergency service water, and the other  
13 examples that I stated before, and those routed  
14 through underground or inaccessible locations, such as  
15 buried conduits, cable troughs, above-ground and  
16 underground. And these are the things that we are  
17 considering to be within the scope of this generic  
18 letter.

19 The benefits of this program are gaining  
20 confidence in the capability of the cable to respond  
21 to design bases events. To give you an example, at  
22 Turkey Point after the hurricane, the diesel had to  
23 run for about a week continuously. And thereafter for  
24 a month's period, the diesel had to come back on for  
25 other spurious power outages.

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1           So if you are looking into an accident  
2 where it has to be on a LOOP condition where these  
3 cables may need to be relied on for a few weeks. So  
4 we are not looking at a few hours of operation. The  
5 confidence needs to be gained for a period much higher  
6 than a few hours, which is usually the subject of our  
7 maintenance and surveillance activities.

8           MEMBER BONACA: Do you have examples of  
9 failures in service that were not exhibited during  
10 functional testing?

11           MR. KOSHY: What we have, the reported  
12 failures are a combination of both. Some in-service  
13 failures certain plants appear to have more than  
14 others. And others, when you start for surveillance,  
15 you find out that, you know, after a couple of hours,  
16 it fails.

17           So the LERs that we recorded are those  
18 cases where the plant impact was significant, so in  
19 the sense either operational. And if it is purely  
20 during a surveillance, we will not get an LER report  
21 on it.

22           So that's some of the problem that we are  
23 facing. The LERs that we received are so limited in  
24 number because, you know, it had to either bring a  
25 plant down or give an easy access situation for us to

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1 plant an LER report.

2 So that's why we are focusing on getting  
3 a handle on the extent of failures so we can engage  
4 them and see what other actions would be necessary.

5 CHAIRMAN WALLIS: Could you explain  
6 something to me?

7 MR. KOSHY: Yes.

8 CHAIRMAN WALLIS: I can understand  
9 off-site power sort of coming in on the underground  
10 cable. Why is diesel generator? Why does the diesel  
11 generator have underground cables? Is it part of the  
12 plant?

13 MR. KOSHY: Yes. For example, in some  
14 plants, the building is a separate building.

15 CHAIRMAN WALLIS: It's in a separate  
16 building. It's in a separate building.

17 MR. KOSHY: Yes. For example --

18 CHAIRMAN WALLIS: Okay.

19 MR. KOSHY: -- they have separate  
20 building.

21 CHAIRMAN WALLIS: They might be in a  
22 separate building?

23 MR. KOSHY: Yes.

24 CHAIRMAN WALLIS: That's very different  
25 from, say, something that comes from off-site power,

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1 where the cable may be a long cable from --

2 MR. KOSHY: Yes. That will be  
3 significantly longer. That will be from the  
4 switchyard. In some cases, you will have a situation  
5 closer to the plant, where you bring down to 13 kVR or  
6 so.

7 CHAIRMAN WALLIS: Okay. Thank you.

8 MR. KOSHY: The next benefit is we can  
9 prevent the unanticipated failures that cause plant  
10 transients by using the maintenance rule as the scope.  
11 We are also looking at challenges to the plant in the  
12 sense of what will give you a plant transient. So  
13 that is what is seen as the scope of this generic  
14 letter.

15 The next is you can use a convenient  
16 outage if you know the rate of degradation. Rather  
17 than taking, you know, unwarranted outages, you can  
18 schedule that cable replacement for a convenient  
19 refueling outage and do the replacement with minimum  
20 interruption.

21 CHAIRMAN WALLIS: Are these cables usually  
22 designed so they can easily be pulled through to  
23 repair them?

24 MR. KOSHY: No. It is very  
25 time-consuming, most of the --

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1 CHAIRMAN WALLIS: There's not a big duct  
2 in the cable and you just drag through a new cable?

3 MR. KOSHY: No.

4 CHAIRMAN WALLIS: No? You have to take it  
5 out? You have to dig it up?

6 MEMBER SIEBER: It's the whole thing. No.

7 MR. KOSHY: Well, pull-through is there,  
8 but the thing is it has a lot of staging. And you  
9 have energized equipment on both sides. So you need  
10 to essentially take some bus outages. So it is  
11 significantly time-consuming.

12 CHAIRMAN WALLIS: Yes, but you don't have  
13 to dig it out?

14 MR. KOSHY: Unless it is direct buried  
15 cable.

16 MEMBER BONACA: In fact, I mean, for  
17 example, yesterday during the review of Monticello,  
18 the majority of their underground cable, they're  
19 buried.

20 CHAIRMAN WALLIS: Those are usually  
21 utility duct or something, in other words.

22 VICE CHAIRMAN SHACK: This is direct  
23 buried.

24 CHAIRMAN WALLIS: Direct buried cable?

25 MR. KOSHY: Those are not exceptions.

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1 Usually you will have a duct bank with some sleeves in  
2 there so that you can pull through it.

3 MEMBER BONACA: And it depends on the age  
4 of the plant. I mean, Monticello is an older plant.  
5 They buried it, and that was it.

6 MR. KOSHY: So you have a wide variety on  
7 those?

8 MR. MORRIS: Tom, George Morris, EEEB.  
9 Some of the original cables that were pulled through  
10 duct bank, all of the original cables that were pulled  
11 through duct bank, were pulled through with the use of  
12 cable lubricant to reduce the friction. After they  
13 had been in there for a while, that lubricant has  
14 dried up.

15 MEMBER BONACA: It doesn't work.

16 MR. MORRIS: In some cases, it's almost  
17 like concrete.

18 MR. KOSHY: Okay. Moving on to some  
19 examples, Ocone is a success story where they found  
20 that two of the six cables had significant  
21 degradation. And they were able to monitor it and  
22 take the outage at a convenient time so that they can  
23 replace them.

24 Another example I am using here is Peach  
25 Bottom. When they experienced a failure, they decided

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1 to make a global replacement. You know, they didn't  
2 want to do any testing at all. And that's also a  
3 solution.

4 CHAIRMAN WALLIS: Now, is it always water  
5 that leads to degraded cables? It seems to me that  
6 you could have a cable and a duct which might just --  
7 you know, the insulation can over a period of time  
8 oxide or whatever it does. I mean, even in your house  
9 without water, you get cables that --

10 MR. KOSHY: Yes.

11 CHAIRMAN WALLIS: The insulation cracks  
12 and so on.

13 MR. KOSHY: This has some influence in the  
14 sense if it is a dry insulation and there is only  
15 cracks, chances are it will survive a little longer.

16 CHAIRMAN WALLIS: That's right, but it may  
17 --

18 MR. KOSHY: The presence of chemicals --

19 CHAIRMAN WALLIS: Makes it work.

20 MR. KOSHY: -- create default.

21 CHAIRMAN WALLIS: It's not essential that  
22 you have moisture, is it?

23 MR. KOSHY: Right. You're right. We are  
24 not trying to look at the root cause of what causes  
25 the failure. We are more interested in seeing,

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1       irrespective of the causes, let's have a program in  
2       place so that we can prevent such unanticipated  
3       failures and have a great confidence in the accident  
4       mitigation capability. So that's the focus we are  
5       trying to get because for --

6                   CHAIRMAN WALLIS: There is no routine  
7       measurement of, say, resistance of ground of a cable?  
8       There is no routine --

9                   MR. KOSHY: There is some technology  
10      developing that way, but online systems have not been  
11      doing that well. I think the industry is headed that  
12      way and there is some aggressive effort in the  
13      industry for coming up with something like that or,  
14      rather, building confidence in the systems that are  
15      now under development.

16                   Oyster Creek is an example where they  
17      replaced the cables and they had few repeated  
18      failures. This design is also unique. They  
19      essentially had this cable going about 200 feet away  
20      from the main plant as an extension of the safety bus.  
21      And this is remaining energized all the time. And  
22      that earlier had several failures.

23                   So the information that we are requesting  
24      is provide to us a history of the cable failures in  
25      the scope that I discussed just before and a

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1 description and frequency of the inspection, testing,  
2 and the monitoring programs in place. And if you do  
3 not have a monitoring program in place, explain to us  
4 why such a program is not necessary. So that is  
5 essentially what we are asking in --

6 CHAIRMAN WALLIS: So this is really  
7 information gathering. This isn't requiring an  
8 action?

9 MR. KOSHY: Right, right.

10 VICE CHAIRMAN SHACK: Now, are you  
11 distinguishing between a monitoring program and a  
12 functional testing program here?

13 MR. KOSHY: Okay. The explanation that we  
14 have given, in fact, I am addressing as a response to  
15 a public comment, what we are saying is the functional  
16 testing that you do that you energize for a short  
17 period doesn't give you any confidence that it will do  
18 it again.

19 VICE CHAIRMAN SHACK: Okay. So you're not  
20 counting that as a monitoring program?

21 MR. KOSHY: Yes. We are not.

22 MEMBER SIEBER: A surveillance test.

23 MR. KOSHY: These are the organizations  
24 that have given response to the first version that  
25 went out for public comments. And I will address the

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1 highlights of how we addressed those comments.

2 Cable failures are random. And,  
3 therefore, no NRC action is required.

4 CHAIRMAN WALLIS: It sounds like saying  
5 they're an act of God or something.

6 MR. KOSHY: Yes. We just explained the  
7 surveillance activity, which wouldn't give you  
8 confidence on its future performance. You need to in  
9 some way monitor the condition of that insulation so  
10 that we can build that confidence.

11 Again, you know, this is the small group  
12 of cable where you have this problem. Otherwise, the  
13 rest of the cable is in a dry environment. Next to  
14 selectable sealed-in concrete, you know, these cables  
15 should be the most reliable piece of equipment in a  
16 plant, you know, should not be failing for about 40  
17 years or, in fact, for 60 years, you know, if it is  
18 the environment and the conditions are right.

19 And I quickly explained before that the  
20 low-voltage cables are included because some of the  
21 early vintage plants have this 480-volt equipment for  
22 safety buses, diesel, and naturalized emergency  
23 service water, and service water equipment.

24 CHAIRMAN WALLIS: The original sentence is  
25 garbled. It doesn't matter. Essentially we have a

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1 period after impact, and that's all right. Scope is  
2 limited.

3 MR. KOSHY: Okay. Again, we just  
4 addressed this issue, why this basic surveillance  
5 tests of operating for a half an hour or two hours  
6 wouldn't be sufficient to gain that confidence for --

7 CHAIRMAN WALLIS: What you do is you put  
8 on them the voltage that they would have in operations  
9 and --

10 MR. KOSHY: No. You actually energize a  
11 --

12 CHAIRMAN WALLIS: Do you actually have to  
13 have current going? Do you have to current going  
14 through these cables to test them or does it have the  
15 voltage applied to them and see if there's a leakage?

16 MR. KOSHY: Yes. There are about eight or  
17 ten techniques in the industry.

18 CHAIRMAN WALLIS: There's a whole lot of  
19 techniques.

20 MR. KOSHY: Yes, yes. And the thing is  
21 the early technique was just apply very high voltage  
22 and make it fail. That was the most crude way of  
23 doing it.

24 MEMBER SIEBER: Meggering.

25 MR. KOSHY: Meggering is another method,

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1 but that has certain weaknesses, too.

2 MEMBER SIEBER: You have reflective  
3 techniques.

4 MR. KOSHY: Yes. Time domain reflects  
5 III, and about six or eight techniques are there. And  
6 there are still some under development. Collectively  
7 you have about two IEEE standards that go into details  
8 of the type of tests available and the level of  
9 confidence that you have based on the type of cable.

10 So depending on if you have a shield and  
11 what kind of shield and what type of rubber material  
12 is used, the level of confidence is different, you  
13 know, depending on the type of test that you do.

14 So there is some industry that two IEEE  
15 standards are available to address that and which one  
16 is better and which one is desired.

17 MEMBER SIEBER: You can get some pretty  
18 high voltages in these cables from switching  
19 transients.

20 MR. KOSHY: That's true.

21 MEMBER SIEBER: It will go well beyond the  
22 rating for a very brief period of time. And sometimes  
23 that's when the insulation fails.

24 MR. KOSHY: Yes.

25 MEMBER BONACA: By "surveillance test,"

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1 you mean surveillance of the equipment and this power  
2 by the cable?

3 MR. KOSHY: Right. You are giving normal  
4 voltage and normal function of a couple of hours, you  
5 know, like in the pump in service inspection or type  
6 of surveillance you will expect to run in for two or  
7 three hours, make sure it is for using the rate of  
8 flow and things like that. That's the type of test  
9 that will not give you a feeling of how good the  
10 insulation is. Will it last for the next two weeks of  
11 runoff?

12 The regulatory basis for our cable  
13 monitoring is we have added that what is seen in bold,  
14 that condition is something that we really did not  
15 have in the first version. And we are essentially  
16 saying that "assess the continuity of the systems and  
17 the condition of the components." So you need to know  
18 the condition of this insulation so that we can have  
19 that confidence on its performance.

20 MEMBER ARMIJO: Could you expand that?  
21 Condition based on electrical properties? Are you  
22 actually looking for physical condition? They're in  
23 accessible.

24 MR. KOSHY: These are inaccessible, but  
25 you do have state-of-the-art techniques available in

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1 electrical testing which will measure the testing of  
2 the insulation.

3 MEMBER ARMIJO: Okay.

4 MR. KOSHY: So if you can establish that  
5 the integrity of the insulation is reasonable, then  
6 you have that confidence that it will not fail in the  
7 most probable cases.

8 MEMBER ARMIJO: Thank you.

9 MR. KOSHY: The question was regarding  
10 multiple cable failures. The only example that we  
11 have collected in light of our efforts is a case where  
12 one insulation failure was in the circulating water  
13 pump, resulted in taking two other substations out  
14 with it.

15 The possibility that we are talking of is  
16 the fault itself causes a transient and sends some  
17 transient current. And if you have some near-failure  
18 equipment, that can be a cause for additional  
19 failures. You know, these are speculative problems.  
20 And this is the only example that we have on record  
21 for that.

22 Now, the modifications that we have done  
23 in light of the comments on this are editorial in  
24 nature, a good part. We revised the scope to include  
25 the above-ground and below-ground duct banks; removed

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1 the broadband spectroscopy because that's not a proven  
2 technique yet, but, again, that could be a technique  
3 available in the future; revised the requested  
4 information to include the type of service so that we  
5 will be able to know if there are repeated failures in  
6 a certain area. And we revised the data collection  
7 time to 60 hours.

8 CHAIRMAN WALLIS: So it would seem that  
9 there is still a gap between your view and the  
10 industry's view.

11 MR. KOSHY: Yes.

12 CHAIRMAN WALLIS: The industry had some  
13 pretty strong comments. And your modifications don't  
14 reflect large changes in response to their comments.

15 MEMBER SIEBER: Right.

16 CHAIRMAN WALLIS: So there would seem to  
17 be still a big gap between your view and the  
18 industry's view. Is that true?

19 MR. KOSHY: I will address that in the  
20 next slides along with the NEI white paper issues, in  
21 slides 16 and 17.

22 CHAIRMAN WALLIS: Okay.

23 MR. KOSHY: We presented this to CRGR.  
24 And CRGR asked us to do two improvements on the  
25 generic letter: to bring the focus on the power

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1 cables itself and also to add a safety-related example  
2 to show the significance of this failure on a plant.  
3 In the package that you have received, we have  
4 incorporated those changes.

5 We received the NEI white paper much after  
6 the comment period on May 1st. I have addressed the  
7 highlights in this coming couple of slides. One is a  
8 graded approach. Again, the number that you see on  
9 the top is the sections that correspond to the NEI  
10 white paper, 6.6.

11 The graded approach for monitoring and  
12 replacement of cables, the bullets are many cables do  
13 not power safety-related equipment; and the other one,  
14 graded approach to replacement and monitoring is best  
15 for safety and business reasons.

16 Our response is that we are only focusing  
17 on those that are significant. That's the very reason  
18 that we are using to bring the scope down to the  
19 maintenance rule. And we mentioned certain systems in  
20 there because to, let's say, overcome the variances  
21 and interpretations on that rule and also because  
22 those examples that we state there are the ones that  
23 have most impact on the plant in the sense affecting  
24 multiple systems.

25 Therefore, these are classified as most

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1 important because of these reasons. And, therefore,  
2 you know, it will be important to prevent the  
3 transients and also in supporting of mitigating the  
4 accident.

5 So that's how we have narrowed the scope  
6 and as to bringing down to only important cables and  
7 not all of the cables at large. And the numbers that  
8 you see in that white paper are some plants have like  
9 300-plus cables. And that won't be within the scope  
10 of maintenance rule.

11 The next one, the recommendations again in  
12 chapter 8, is provide dry environment, prepare for  
13 cable failures, and share failure resolutions.

14 Providing a dry environment -- again, you  
15 know, these are all installed cables. It's not quite  
16 practical. And pumping out would help. It will slow  
17 down the failure, but it cannot prevent the failure.  
18 It may take a little longer. And these cable failures  
19 could affect many systems. And the replacement of  
20 these cables is very time-consuming.

21 So if you have a valid accident mitigation  
22 method and at that time trying to make this cable  
23 replacement could be very difficult because the cables  
24 that run in the same duct banks could be helping the  
25 accident mitigation at that time. And your cable

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1 pulling and taking bus outages would not be desirable  
2 actions when you run into an accident environment or  
3 facing a LOOP or a station blackout.

4 And the technique is available there to  
5 have that reasonable confidence so that we can rely on  
6 these cables for continued operation.

7 That's all we have prepared for presenting  
8 to you. And if you have --

9 MEMBER BONACA: I have a question --

10 MR. KOSHY: Sure.

11 MEMBER BONACA: -- regarding in the  
12 generic letter, you talk about 23 LERs --

13 MR. KOSHY: Right.

14 MEMBER BONACA: -- and two monitor  
15 reports. Then the letter says that you believe that  
16 this is a very small fraction. That is the word used  
17 in the LER in the generic letter, a very small  
18 fraction of the actual failure to take place, which  
19 tells me that the number of failures that happen may  
20 be in the hundreds.

21 What is the projection? What does it mean  
22 that 25 in total is a very small fraction?

23 MR. KOSHY: It's very difficult to make  
24 such an estimate, but let me give a personal  
25 experience that I know of. I was at an AIT for a

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1 plant where they had such a cable failure. At that  
2 time they had six cable failures already when we had  
3 the AIT in the mid '80s. So that is repeated failures  
4 happening at one plant.

5 MEMBER BONACA: Okay.

6 MR. KOSHY: Again, I know of another  
7 Northeastern plant where they have all of these  
8 service water cable and emergency service water cables  
9 going through manholes. And they had splices in that  
10 also. And this manhole gets filled with water. And  
11 when the manhole cover knocks out, that's when you  
12 find out the splice failed. They had also quite  
13 repeated failures.

14 So certain plants may have a higher  
15 susceptibility because of groundwater and the design  
16 uniqueness. There may be some plants in absolutely  
17 dry environment, like WNP 2 in the middle of the  
18 desert. They may not have any cable problems because  
19 it's always dry. and if it all drains, it dries out  
20 so fast. So some plants may be fully exempt from this  
21 problem.

22 If the water table is a guide, those are  
23 the ones where you have high susceptibility and  
24 failures. And some plants are kind of glaringly  
25 different than others.

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1                   MEMBER BONACA: The information you are  
2 requesting is regarding all cables, right, not only  
3 those in a weather condition?

4                   MR. KOSHY: All cables and inaccessible.

5                   MEMBER BONACA: Inaccessible.

6                   MR. KOSHY: Yes.

7                   MEMBER BONACA: Exactly. Okay.

8                   MR. KOSHY: So plants where they did not  
9 have failures would not have anything to report. But  
10 if you had failures, we would like to know them --

11                   MEMBER BONACA: Yes.

12                   MR. KOSHY: -- so that we can kind of  
13 gauge, you know, are there repeated problems, what are  
14 the vulnerabilities, and based on that probably share  
15 the lessons and see if you have to take further  
16 action. Maybe it's down to a few plants. We do not  
17 know that because we lack the data to support that.

18                   And the NEI white paper data shows about  
19 15 plants having about 45 to 50 failures. That could  
20 be an indication because they focused on underground  
21 and medium voltage only.

22                   MEMBER BONACA: But your monitoring  
23 program that you're talking about doesn't deal only  
24 with cables that failed. It deals with cable aging  
25 that may be operable during functional testing that

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1 failed during demand, service.

2 So how are you going to gather information  
3 regarding these kind of cables?

4 MR. KOSHY: Okay. What we are saying is  
5 if those cables are within the scope of maintenance --

6 MEMBER BONACA: Yes.

7 MR. KOSHY: -- and they're underground and  
8 inaccessible, tell us if you have failures. And do  
9 you have a program when they have this susceptibility  
10 for failure to make sure that it wouldn't fail?

11 MEMBER BONACA: I understand.

12 MR. KOSHY: So you're not on the scope.  
13 Tell us what the failure is. And see how you monitor.

14 MEMBER BONACA: Right.

15 MEMBER ARMIJO: I have a question. How  
16 can you have a failure of above-ground inaccessible  
17 cable without water? Is it --

18 MR. KOSHY: Okay. What happens is, you  
19 know, even in some large conduit connections which go  
20 on the surface because of the variance, you get  
21 condensation built in there unless you have a way of  
22 venting it out.

23 MEMBER ARMIJO: Well, it could be a  
24 significant amount of water.

25 MR. KOSHY: You could collect all the

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1 time.

2 CHAIRMAN WALLIS: You get a humid day and  
3 a cold night.

4 MR. KOSHY: For the condensation and --

5 MEMBER SIEBER: You can get cable failures  
6 from things other than water.

7 MR. KOSHY: Yes, other chemicals and other  
8 leeching, yes.

9 MEMBER SIEBER: Chemicals, overheating.  
10 You know, that degrades insulation or defect in  
11 splices, for example, if --

12 MR. KOSHY: Yes. Splices is another  
13 vulnerable point.

14 MEMBER SIEBER: It's handmade.

15 MEMBER MAYNARD: A couple of questions.  
16 On the provided inscription of the frequency of all  
17 inspection testing, monitoring, are you talking about  
18 what is currently in place or are you asking the  
19 licensee to go back to day one for all of what testing  
20 has been done?

21 MR. KOSHY: We are asking for what you  
22 have in place now so that you can put in place such  
23 unanticipated failures.

24 MEMBER MAYNARD: Okay. And the other  
25 thing is, is the staff coordinating in any way? This

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1 is requesting this information to be within 90 days.

2 MR. KOSHY: Right.

3 MEMBER MAYNARD: And it would appear to me  
4 that if the other generic letter on the spurious  
5 actuation gets issued, a lot of the same resources  
6 could be required or needed for a lot of these  
7 activities, both dealing with electrical circuits,  
8 just --

9 MEMBER SIEBER: This one is pretty --

10 MR. KOSHY: We will work with the Generic  
11 Communications Division so that we would be sensitive  
12 to that.

13 CHAIRMAN WALLIS: So what are you going  
14 with the information when you get it?

15 MR. KOSHY: What we are hoping is that  
16 depending on, let's say, the breadth and depth of the  
17 problem as to why widespread, we may have to think of  
18 NRC action if that warrants it. We have --

19 CHAIRMAN WALLIS: You think that there  
20 might be some problem. You have this sort of you  
21 almost call it a fishing expedition, where you get all  
22 of this information. And then you look at it and say,  
23 "Aha. Now we have to do something or not." You're  
24 not quite sure what you are going to find.

25 MR. KOSHY: Okay. We know it is a

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1 significant problem in the light of what I explained  
2 to you.

3 CHAIRMAN WALLIS: There have been events,  
4 right.

5 MR. KOSHY: Yes. We have been having  
6 events, which either the plant is out or disabled  
7 safety systems. And those things kind of give you a  
8 flavor of significance.

9 CHAIRMAN WALLIS: But the result of all of  
10 this information gathering might be that you decide  
11 everything is okay as it is now.

12 MR. KOSHY: If the industry has, let's  
13 say, commitments to prevent such failures, yes. But  
14 if you are seeing failures and repeated failures, we  
15 have to rethink what we should be doing. Okay? We  
16 are not there yet. We need to --

17 MR. MAYFIELD: Professor Wallis, this is  
18 Mike Mayfield from the staff. As we assess the  
19 results we get back from this, we would have to make  
20 a decision whether generic action is warranted or is  
21 there some plant-specific action that is warranted or  
22 things are being managed appropriately as it is. And  
23 we just don't know until we get the results back. We  
24 have enough indicators to make us believe that we need  
25 to go --

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1 CHAIRMAN WALLIS: I think the industry  
2 response to the public comments was everything is  
3 fine, we're doing the right thing now. You just want  
4 the assurance that it really is so.

5 MR. MAYFIELD: That might be the outcome.  
6 And we'll have to see what actually comes in.

7 MEMBER SIEBER: The third question sort of  
8 tips your hand as to what you want. And it says if a  
9 monitoring or surveillance program is not in place,  
10 explain why such a program is not necessary.

11 In other words, here's a plant with  
12 failures. And they're not testing anything.

13 MR. MAYFIELD: We might want to chat with  
14 them a bit.

15 MEMBER SIEBER: You gave them the hint.  
16 You ought to test something.

17 MEMBER BONACA: Or you may have a plant  
18 where there have been no failures and you have no  
19 significant power equipment. Then why should you even  
20 have a test? I mean, then you have a threshold for  
21 saying, "We don't need it."

22 MEMBER MAYNARD: I've got a feeling when  
23 you get all of this, the actual number of failures if  
24 you divide it by the number of plants and the number  
25 of operating years wouldn't look that great, but when

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1 you go to group them, there may be some areas where  
2 you --

3 MR. MAYFIELD: Exactly. And that is not  
4 an uncommon outcome from getting this kind of  
5 information.

6 MR. KOSHY: One thing you find out is the  
7 data that we have at this time is based on normal run  
8 and surveillances, not an extended use of like two,  
9 three weeks. So what we are trying to see is gain  
10 confidence that these cables can continue in service  
11 for two or three weeks if there is a station blackout  
12 or some reason and we can continue to rely on these  
13 cables for that safety function.

14 MEMBER BONACA: Yes. That is a very  
15 important issue, you know, the failure to run. So the  
16 equipment starts, but then it won't run for as long as  
17 it has to. And that's trickier because, I mean, the  
18 number of failures experienced to date doesn't give  
19 you a specific insight on these cables. And that's  
20 their function.

21 MR. KOSHY: Right.

22 MEMBER BONACA: Any additional questions?

23 (No response.)

24 MEMBER BONACA: If not, I thank you for  
25 the presentation.

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1 MR. KOSHY: Thank you.

2 MEMBER BONACA: I think Mr. Marrion of NEI

3 --

4 MR. MARRION: Yes.

5 MEMBER BONACA: -- would like to make a  
6 statement. NEI, of course, produced that white paper  
7 that is quite interesting on this issue.

8 MR. MARRION: Good afternoon. I'm Alex  
9 Marrion, the Senior Director of Engineering at NEI.

10 I do have a couple of comments I want to  
11 make about basically what we heard. We haven't seen  
12 the staff disposition of the public comments that have  
13 been submitted. Nor have we seen the current version  
14 of the proposed generic letter.

15 But I have to tell you I am confused. And  
16 the reason for that confusion is that a couple of  
17 years ago, I received a letter from the Electric  
18 Systems Branch Chief articulating concern with a  
19 potential common mode of medium voltage cables. And  
20 the common mode failure mechanism was water training.  
21 This was based upon a review of 20-some odd licensee  
22 event reports.

23 We had a public meeting with the staff to  
24 understand, get a little more of an understanding of,  
25 their concerns. And we looked into the licensee event

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1 reports, and they had -- I'm trying to remember. I  
2 think there was only one or two that had a potential  
3 for being related to the water-training phenomenon  
4 that the staff was concerned with.

5 But it became clear to us that we needed  
6 to develop a document that would be an educational  
7 piece, if you will, primarily focusing for the  
8 industry, but we also felt that the NRC could possibly  
9 benefit from it. And that was the basic objective for  
10 the white paper that we developed.

11 The purpose for the educational piece was  
12 to articulate a clear understanding of the  
13 water-training phenomenon to articulate our assessment  
14 of the licensee event reports that the staff was using  
15 as a basis --

16 CHAIRMAN WALLIS: You're talking about a  
17 water-training phenomenon?

18 MR. MARRION: Water training, yes.

19 CHAIRMAN WALLIS: Training. Oh, I'm  
20 sorry.

21 MR. MARRION: Yes, water training. I'm  
22 sorry. I've got a cold, and I'm a little congested.  
23 I apologize.

24 CHAIRMAN WALLIS: That's my  
25 misunderstanding. I'm sorry.

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1 MR. MARRION: -- and also provide us a  
2 technically based understanding of the application of  
3 that phenomenon to basic cable configurations and  
4 insulation systems that exist in the power plants  
5 today or not in the power plants but exist in these  
6 applications today.

7 We concluded that you can't make a general  
8 statement that water training is of concern because  
9 it's not applicable to every cable configuration and  
10 insulation system that's in the field today.

11 It appears that the staff is attempting to  
12 require a cable-monitoring program. I'm not familiar  
13 with the details of the maintenance rule, but I know  
14 that the equipment to which these cables are  
15 terminated are monitored in the maintenance rule.

16 And since the cables aren't active  
17 components, I'm not sure whether they should be  
18 included in the maintenance rule or not. But  
19 fundamentally if the staff expectations and basis in  
20 this generic letter are not clear, you have the  
21 potential of a generic letter basically undermining a  
22 regulation.

23 I don't know if the staff has done a  
24 review with the maintenance rule folks within NRR, but  
25 I would recommend that be done before this is

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1 submitted.

2 CHAIRMAN WALLIS: You're implying this,  
3 but, in fact, they just say they're gathering  
4 information. And it's not clear that they intend to  
5 do anything which would change the regulation in any  
6 way or interfere with regulation. You don't know what  
7 they're going to do.

8 MR. MARRION: And the licensee has to  
9 document a justification of why they don't have a  
10 cable-monitoring program. That is --

11 CHAIRMAN WALLIS: But you're implying that  
12 something downstream is going to require this. That's  
13 not actually a --

14 MR. MARRION: No. I'm implying there may  
15 be a conflict between what the generic letter is  
16 asking for and what is required by the --

17 CHAIRMAN WALLIS: You're asking for  
18 information, rather.

19 MR. MARRION: Well, okay. That's one way  
20 of looking at it. It is a request for information or  
21 an attempt to require a cable-monitoring program. And  
22 I'll let you folks decide how you want to do that if  
23 they want to interpret that.

24 I think that, you know, the staff has made  
25 some comments about, you know, what their concern is.

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1 And it's not clear to me. I have to tell you I'm  
2 confused. Maybe it's because of our involvement over  
3 the past several years, but I have yet to see any kind  
4 of risk analysis or any kind of statistical analysis  
5 conducted by the NRC to articulate some level of  
6 confidence that they find unsatisfactory relative to  
7 the performance of the cable or the equipment.

8 We have attempted to do some statistical  
9 work in our white paper based upon the survey that we  
10 had conducted. I'm not happy with the fact that we  
11 didn't get 100 percent of the utilities to respond,  
12 but we got on the order of 80 percent, I think, 79.  
13 something. That has some benefit.

14 My concern at this particular point is  
15 when the generic letter is finally issued, based upon  
16 what I heard this afternoon, we're going to have to  
17 request a meeting, a public meeting, and probably  
18 document further clarification of what the NRC is  
19 really interested in this information request as they  
20 go forward because it's not clear at this particular  
21 point in time. And that's all I have to say. I would  
22 be more than happy to answer any questions you may  
23 have.

24 (No response.)

25 MR. MARRION: Okay. Thank you.

1 CHAIRMAN WALLIS: You're welcome.

2 You were suspicious that if they gather  
3 this information, then they might use it to require  
4 something which they wouldn't be able to do if they  
5 didn't have the information?

6 MR. MARRION: No. It's not clear what  
7 concern is trying to be addressed by the request for  
8 information.

9 CHAIRMAN WALLIS: Well, the concern is  
10 that these cables will fail. It's a simple concern.

11 MR. MARRION: Well, where does that  
12 concern stop? Do you stop at these cables or do you  
13 continue that concern at the equipment, et cetera,  
14 that is under continuous surveillance programs and  
15 testing? I mean, where does it end?

16 And it's a concern about having possible  
17 unanticipated failures? Well, where do you stop  
18 asking that question now that you started on medium  
19 voltage cables and the small population of medium  
20 voltage cables, I suspect?

21 So there are some real issues that have to  
22 be addressed here because the utilities are going to  
23 want to be responsive to the generic letter. My job  
24 is to make sure that we understand it adequately so  
25 the utilities will be responsive, but right now I'm

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1 not sure we have that understanding.

2 MEMBER BONACA: Well, if I understand it,  
3 I mean, the issue has to do with two things. One is  
4 inaccessible equipment that cannot be visually or  
5 other means inspected -- so it's a very narrow family  
6 -- and then equipment that is really in accepted  
7 applications.

8 And clearly equipment is seeing a water  
9 condition or wetness that -- so it's a pretty unique  
10 and narrow population, but I think at least I am  
11 interested to know what kind of equipment is being  
12 powered by this kind of cable out there. And if it is  
13 something critical, a generic letter or whatever,  
14 connection to off-site power, you know, it's a unique  
15 concern.

16 I mean, we addressed it and discussed it  
17 during license renewal because it was significant.  
18 And the industry and the NRC worked together on a goal  
19 inspection program for those cables.

20 And where does the aging start? I mean,  
21 does it start with a theatre of operation or does it  
22 start before? Clearly there is degradation taking  
23 place at some point. I realize I don't know all there  
24 is necessary to know about that.

25 MR. MARRION: If I may just offer a couple

1 of comments?

2 MEMBER BONACA: Yes?

3 MR. MARRION: The aging phenomenon begins  
4 from the time that the cable is shipped from the  
5 manufacturer's facility.

6 MEMBER BONACA: That's right.

7 MR. MARRION: And it's exacerbated by  
8 environmental conditions as well as operational  
9 conditions that wind up stressing the cable insulation  
10 system. And a submerged, wetted environment for  
11 certain insulation systems has the potential of  
12 increasing the aging or the rate of aging degradation,  
13 et cetera. That is well-known.

14 The equipment that's affected here  
15 includes diesel generators at some plants at 4,000 or  
16 4,160 volts as well as other plants at 6.9 kV. I  
17 don't know about -- I think one of the staff was --  
18 Tom made a comment about some diesel generators  
19 operating in the 480 volts. If that's indeed the  
20 case, then that's indeed the case.

21 But mean voltage cable in the industry is  
22 characterized as 2,000 to 15,000 volts. So I'm hoping  
23 that the generic letter will be very clear of  
24 articulating the 480-volt applications. And is it  
25 only for that particular piece of equipment or is it

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1 for something else? That's one of the points of  
2 clarity that's needed.

3 We tried to capture in our white paper --  
4 and I hope you've read it; we've made it available to  
5 you -- the current state of understanding of cable  
6 insulation systems at this voltage level and  
7 underground applications and which insulation systems  
8 are susceptible to water damage over time.

9 We have encouraged the utilities to  
10 prepare for such failures because if you look at the  
11 age of the fleet, we are approaching the end of  
12 service life of a lot of these cables. It's typically  
13 30, 35, 40 years based upon normal environmental  
14 conditions.

15 And our recommendation to the industry was  
16 don't wait for a failure before you have to deal with  
17 this problem because this is not the kind of cable  
18 that you typically keep large quantities in inventory  
19 at the warehouse, et cetera. And if you're not  
20 prepared, you will have an extended outage should you  
21 have such a failure.

22 I don't know if the generic letter is  
23 going to speak to that, but I also know that there is  
24 not a cable-monitoring system that is applicable and  
25 effective and available to the utilities today.

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1           There are some testing techniques that are  
2 effective for certain kinds of insulation  
3 configurations. And our white paper speaks to that.  
4 But based upon the information I have gotten from  
5 EPRI, who is pursuing research in this area, et  
6 cetera, that there isn't one technique that would be  
7 useful. So okay?

8           MEMBER BONACA: Thank you.

9           MR. MARRION: Thank you.

10          MEMBER BONACA: Yes. I think we're  
11 scheduled for some closing remarks. Is there?

12          MR. MAYFIELD: Just very briefly. We  
13 believe we have articulated why we need the generic  
14 letter. If indeed there is substantive confusion or  
15 misunderstanding once we have published the generic  
16 letter, we would, as always, be more than willing to  
17 meet with the industry and make sure that there is a  
18 common understanding of what we're asking for.

19          This generic letter has been in process  
20 for a while. And we do believe we need to move  
21 forward to get the generic letter published and allow  
22 licensees the opportunity to engage with it. We will  
23 be mindful of any conflicts with other generic  
24 communications that are going forward where we may be  
25 imposing unreasonable time constraints and resource

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1 constraints on the licensees. That's something that  
2 we will pay attention to and go back and pulse with  
3 the generic communication staff and the other  
4 technical staff to make sure we're online there.

5 With that, unless the Committee has other  
6 questions for the staff, I believe we have presented  
7 to you the information that we wanted to present. And  
8 we look forward to receiving a letter from you. Thank  
9 you.

10 MEMBER BONACA: Any other questions for  
11 Mr. Mayfield?

12 MR. FALLON: I have a question. Mike  
13 Fallon with Constellation Energy.

14 For the license renewal applicants that  
15 have submitted under the GALL report, these cables are  
16 all in the scope of license renewal, have been  
17 addressed in their applications. Are they being asked  
18 to resubmit this information again?

19 MR. KOSHY: This is Thomas Koshy.

20 This generic letter will fall under the  
21 Part 50 program, in which case we are addressing,  
22 let's say, something more than what was addressed in  
23 the renewal program. So there is a need for making  
24 separate submittal to the NRC in response to this  
25 generic letter.

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1 MR. FALLON: All of the cables that you  
2 have addressed, all of the safety-related cables, are  
3 in the scope of license renewal. And whether they're  
4 480-volt or they're medium voltage, they're addressed  
5 in those applications.

6 MR. MAYFIELD: Okay. Let me comment.  
7 This is Mike Mayfield from the staff.

8 You raise a good point. It is something  
9 we will look at and make sure we're not asking you to  
10 unnecessarily duplicate information. But that is a  
11 fair question, something that we'll make sure that --

12 MEMBER BONACA: Well, I am not aware that  
13 license renewal applications have the summary of all  
14 of the failures that have taken place. We are going  
15 to get to the information.

16 MR. MAYFIELD: We don't think we are in  
17 conflict, but it's a fair question. And we'll look to  
18 make sure we are not asking an unreasonable question.

19 CHAIRMAN WALLIS: But you will be looking  
20 at plants which doesn't necessarily have license  
21 renewal in prospect.

22 Are we through with this item now or --

23 MEMBER BONACA: Are there additional  
24 questions for the staff, for industry, for us?

25 (No response.)

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1 MEMBER BONACA: If none, I think it's  
2 over.

3 CHAIRMAN WALLIS: Thank you.

4 MEMBER BONACA: And we open it up back to  
5 you, Mr. Chairman.

6 CHAIRMAN WALLIS: Now, I really am  
7 reluctant to take a break for an hour. I wonder if we  
8 couldn't work on -- is it okay, staff who is an expert  
9 on this? Can we work on Mario's letter on this issue  
10 right now on just a preliminary basis?

11 Let's go off the record and work on his  
12 letter for half an hour or an hour.

13 MEMBER SIEBER: We have to come back.

14 CHAIRMAN WALLIS: Can we do that? You're  
15 not ready? We do have a draft letter. Will the  
16 Committee agree to work on his letter? We can discuss  
17 it now, but I think we can go off the record and  
18 discuss our reaction to this generic letter and work  
19 on our letter until about 3:00 o'clock. Is that okay  
20 with the Committee?

21 So let's do that. We'll come off the  
22 record now, and we will work on this letter until  
23 about 3:00 o'clock. We'll have some discussion now  
24 off the record.

25 (Whereupon, the foregoing matter went off

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1 the record at 2:25 p.m. and went back on  
2 the record at 3:18 p.m.)

3 CHAIRMAN WALLIS: We will come back on the  
4 record, come back into session.

5 CHAIRMAN WALLIS: The next item on the  
6 agenda is, let's see now, interim staff guidance. Is  
7 that what it is?

8 MEMBER BONACA: Yes.

9 CHAIRMAN WALLIS: And I will again call on  
10 Mario Bonaca to lead us through this one.

11 MEMBER BONACA: Okay.

12 4) INTERIM STAFF GUIDANCE AGING MANAGEMENT PROGRAM

13 FOR INACCESSIBLE AREAS OF BOILING WATER REACTOR

14 (BWR) MARK I CONTAINMENT DRYWELL SHELL

15 4.1) REMARKS BY THE SUBCOMMITTEE CHAIRMAN

16 MEMBER BONACA: We have the staff here to  
17 provide us with an overview on the proposed license  
18 renewal interim staff guidance on steel containment of  
19 BWR Mark I containments.

20 We have reviewed a number of BWRs. And  
21 we have often asked the question on the status of the  
22 steel liner. And we have seen different proposals by  
23 licensees, some of them planned inspections, only  
24 metric inspections. Some of the others don't.

25 And the staff is using a successful

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1 process that has been successful in most of the  
2 license renewal applications to date, the ISG process,  
3 as a means of proposing an approach that they expect  
4 the licensees to follow regarding this particular  
5 item.

6 And so the staff has come here to give us  
7 an overview of this process and what they are  
8 proposing to do. And I will let the staff go ahead.  
9 I don't know if Mr. Gillespie or Mayfield --

10 MR. GILLESPIE: Yes. If I could, just  
11 some opening comments to put in context what Linh and  
12 Hans are going to go through. Not only did we do a  
13 couple already, but we've got something like seven  
14 Mark I's lined up in the queue. And we have a number  
15 of very controversial ones in New Jersey,  
16 Massachusetts, and Vermont, where there is actually a  
17 lot of public interest. And we had no position on the  
18 liner itself.

19 There are some caveats or I'm going to say  
20 some wiggle room in this position I'd like to  
21 highlight to the Committee by way of how the staff is  
22 approaching this because a question at the meeting  
23 yesterday at Monticello was, why is it different plant  
24 to plant if you're trying to apply a consistent  
25 approach.

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1           This is kind of an approach for the plant  
2           that's got almost like the optimum conditions, of  
3           which Monticello with their leakage control programs  
4           and some things they were doing was.

5           Browns Ferry, an earlier one, which  
6           committed to doing some other measurements, actually  
7           had an operating history of having leaks. And so they  
8           had moisture content in there. And so we actually  
9           have -- this is a minimum condition, as we would look  
10          at it.

11          And there are also some wiggle words,  
12          quite honestly, in this. And that's where it says  
13          first you have to establish a degradation rate,  
14          basically. And then if you get moisture, this  
15          basically treats moisture in the outside of the shell  
16          the same as visible accelerated corrosion on the  
17          inside.

18          And we're using the ASME code kind of  
19          enhanced inspection, but, instead of referencing the  
20          code, we described the enhanced inspection in it in  
21          case the code changes in the future.

22          So we're bringing definition to an  
23          equivalence to inside and outside indications. And  
24          there is still a lot of room on how you establish the  
25          rate and what is the credibility of the rate.

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1           And so if you have a history as a facility  
2 of having leakage and, therefore, moisture in there,  
3 then I think the Committee should expect the staff in  
4 establishing the rate in those wiggle rooms because it  
5 says if you have moisture, reestablish your rate again  
6 -- and the only way to factually reestablish the rate  
7 is likely do a UT measurement and then connect the  
8 dots again. Literally a simplistic way of looking at  
9 it is a regression line between the now additional  
10 point.

11           And so Hans in his efforts as a reviewer  
12 still has a lot of room in what are the uncertainties  
13 in establishing the rate. And it's those  
14 uncertainties which kind of differentiate one plant  
15 from another. How do you reduce those uncertainties  
16 given different operating histories?

17           And so that's really how come Monticello  
18 is different from Browns Ferry. It's strictly  
19 operating history and the uncertainty involved with  
20 known moisture leak on multiple occasions.

21           So, with that, let me turn it over to Linh  
22 because that's just kind of the context. Linh, take  
23 it away.

24           4.2) BRIEFING BY AND DISCUSSIONS WITH  
25           REPRESENTATIVES OF THE NRC STAFF

1 MS. TRAN: Good afternoon. My name is  
2 Linh Tran. And I'm the Project Manager with the  
3 Division of License Renewal. And this is Hans Ashar.  
4 He's a senior civil engineer with the Division of  
5 Engineering.

6 We are here this afternoon to present the  
7 proposed license renewal interim staff guidance for  
8 the inaccessible area of the BWR Mark I drywell  
9 containment shell.

10 The purpose of this ISG is to provide  
11 guidance to future applicants on the information that  
12 is needed to be included in the license renewal  
13 applications for addressing the inaccessible area of  
14 the drywell shell.

15 Now, the proposed ISG here does not impose  
16 any no new technical requirement. And in previous  
17 license renewal application review by the staff, we  
18 usually can obtain the information in the applications  
19 or through the request for additional information.  
20 And usually we will get the information from the  
21 applicant.

22 The information provided by the applicant  
23 is sufficient for the staff to make its determination.  
24 However, it is not the most efficient way because of  
25 the RAI back and forth. And in an effort to reduce

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1 the number of RAIs, this proposed ISG would identify  
2 the information up front, so for the future  
3 applicants, what they should include in the LRAs, I  
4 guess, to make the staff review more efficient,  
5 information such as inspection results or analysis  
6 that would help the staff make the determination  
7 whether the containment would perform its intended  
8 function for the period of extended operation.

9 Past operating experience in the Mark I  
10 steel containments indicate that when water is  
11 discovered in the bottom outside area of the drywell  
12 shell, the most likely cause could be the water  
13 seeping through the inaccessible area.

14 And in slide 10 in your handout, I have a  
15 picture of the drywell shell. It is an inverted light  
16 bulb. That indicates where the inaccessible area  
17 would be.

18 And this area is the area for the distance  
19 between the drywell shell -- did you do slide 10?;  
20 that's a picture there; yes -- where the surrounding  
21 concrete structure is too small for successful  
22 performance of visual inspection. That's the area  
23 right there. The gap is usually two inches, three  
24 inches.

25 CHAIRMAN WALLIS: You used the term

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1 "seeping." It's really any water that gets there from  
2 any reason whatsoever.

3 MS. TRAN: Correct.

4 CHAIRMAN WALLIS: And "seeping" is used as  
5 a general term.

6 MS. TRAN: Term, correct.

7 CHAIRMAN WALLIS: It may not seep. It may  
8 actually flow or --

9 MS. TRAN: Flow through, right.

10 MR. ASHAR: The area that we are  
11 concentrating on is between the shell, between the  
12 shell and the concrete in the back, in between the  
13 insulation --

14 MEMBER BONACA: No, no, no.

15 MR. ASHAR: Oh, I'm sorry. Wrong place.

16 MS. TRAN: Right. That's --

17 MEMBER APOSTOLAKIS: It is between what  
18 and what?

19 MR. ASHAR: Between the freestanding steel  
20 containment --

21 MEMBER BONACA: Between the light bulb and  
22 the --

23 CHAIRMAN WALLIS: There's a space right  
24 there.

25 MR. ASHAR: And mostly it is filled with

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1 insulation.

2 MEMBER APOSTOLAKIS: How does the water  
3 get there?

4 MR. ASHAR: Water gets into -- I'm going  
5 to explain. There are three basic sources of water  
6 that we have seen so far in the operating history.  
7 One can be called because of the -- we don't have any  
8 picture of the actual area.

9 MS. TRAN: No. This is it.

10 MR. ASHAR: This is it. In this area,  
11 there are bellows, bellows between the driver.

12 CHAIRMAN WALLIS: We saw them this  
13 morning.

14 MR. ASHAR: Yesterday you may have seen  
15 it, yes. And those bellows can crack. And then they  
16 can give a seepage into the trough, which collects the  
17 water.

18 Now, if the drain, which is supposed to  
19 drain out all the water from there, is full or is not  
20 working properly, the water can accumulate in the  
21 trough area, which has been kept just for that  
22 purpose. And it may all flow in coming to this area  
23 here.

24 CHAIRMAN WALLIS: It's lower.

25 MR. ASHAR: Because it is not showing

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1 better this particular detail, this is not good  
2 enough. Yesterday it was a very nice picture here.

3 CHAIRMAN WALLIS: But in order to refuel,  
4 you have to flood the upper region there.

5 MR. ASHAR: That is correct.

6 CHAIRMAN WALLIS: And some of that water  
7 can get down on the outside.

8 MEMBER APOSTOLAKIS: Okay. Thank you.

9 MS. TRAN: Now, in this --

10 VICE CHAIRMAN SHACK: Now, is that the  
11 only source of the water, I mean?

12 MR. ASHAR: No, no. There are two or  
13 three we found so far. Okay? One is a cracking of  
14 bellows. Second one is there is a refueling seal  
15 between the bottom of the trough, concrete trough.  
16 And there is a systematic way of draining it out  
17 through a drainage. But drain gets clogged. And the  
18 water comes through that area. It collects in the  
19 trough again and goes into between the concrete and  
20 the drywell shed.

21 Clog one is the reactor cavity wall. You  
22 have a stainless steel liner on it. And stainless  
23 steel liner gets -- they may do for any reason. And  
24 the water goes directly from concrete into that gap in  
25 between the two.

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1                   These are three reasons we have identified  
2                   so far.

3                   CHAIRMAN WALLIS:   So what clogs this  
4                   drain?  You said the drain gets clogged?

5                   MR. ASHAR:  It is because of negligence on  
6                   the part of the various --

7                   CHAIRMAN WALLIS:  Yes.

8                   MR. ASHAR:  -- not to monitor them  
9                   correctly.  Now they have come to their senses.  And  
10                  they started telling us they are monitoring, they are  
11                  doing this, they are doing that.

12                  MEMBER BONACA:  The drains are down from  
13                  the sand cushions, right?

14                  MR. ASHAR:  They are separate.  After the  
15                  water leakage, it is the sand cushion area.  Then  
16                  there are drains to -- actually, those drains were  
17                  meant for making sure the scent does not go away.  And  
18                  if it is, then they can collect them and put them back  
19                  the same.  That was the whole idea behind it.

20                  But it has been used nowadays as a  
21                  water-collecting/catching kind of a thing.  It is an  
22                  indirect function of that particular drain, but that  
23                  shows that water is coming in.  If the drains into  
24                  that room, if it shows any kind of water in the Torus  
25                  room, then it shows that there is a water leakage from

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1            somewhere up above that is getting into that area.

2                    CHAIRMAN WALLIS:  It drains into the room  
3 around the Torus?  It just drips down the wall  
4 somehow?

5                    MEMBER SIEBER:  Yes.

6                    MR. ASHAR:  The water comes from here.

7                    CHAIRMAN WALLIS:  That is a four-inch  
8 drain pipe.  It just drains down the wall?

9                    MR. ASHAR:  This is a sand pocket here.

10                   CHAIRMAN WALLIS:  Where does it go to when  
11 it drains out of that four-inch drain pipe?

12                   MEMBER SIEBER:  Onto the floor.

13                   CHAIRMAN WALLIS:  It just drains onto the  
14 floor?

15                   MR. ASHAR:  Unless they are collectors.  
16 Some people have started collecting them into some  
17 kind of a jar.  But most of them, yes, it was going  
18 onto the floor.

19                   MS. TRAN:  It goes onto the floor, yes.

20                   MR. ASHAR:  There is where they find out.

21                   MEMBER BONACA:  Now, some licensees have  
22 the drainage and some don't.  That depends on the --

23                   MR. ASHAR:  Well, some licensees have  
24 drains of the sand pocket area here.

25                   MEMBER BONACA:  Down at the low point.

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1 MR. ASHAR: Some people have drains at  
2 this area somewhere on the top of it.

3 MEMBER SIEBER: I think all of them --

4 MR. ASHAR: And if it is on the top of it,  
5 then there has to be sealing between --

6 MEMBER SIEBER: All of them have the top.

7 MR. ASHAR: -- the concrete and the --  
8 yesterday we saw in the Monticello case, it was a  
9 seal, which was a galvanized steel shield between the  
10 sand pocket area and the above area. So it prevents  
11 the water from getting in.

12 MEMBER BONACA: The had a few ounces of  
13 water, too, at some point.

14 MR. ASHAR: Yes, yes.

15 MEMBER BONACA: So they must have come  
16 also from the top.

17 MR. ASHAR: In the case of Monticello,  
18 there were no signs like that. We did not see.

19 MEMBER BONACA: There were only a few  
20 ounces of water, they said.

21 MEMBER MAYNARD: Yes, but they speculated  
22 that that water had actually come from another source  
23 because of the two or three-inch sand pipe there.

24 MEMBER BONACA: On the sand pipe there,  
25 yes.

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1 MR. ASHAR: They could explain when you  
2 ask that question.

3 CHAIRMAN WALLIS: Well, if it drains down  
4 that four-inch drain pipe, I would assume that the  
5 sand is full of water.

6 MEMBER SIEBER: Yes.

7 MEMBER MAYNARD: Right. That is not the  
8 low point.

9 CHAIRMAN WALLIS: There is a lot of water  
10 there before it drains down the pipe. The sand  
11 pocket, the sand --

12 MR. ASHAR: The sand pocket has to be  
13 sucked up completely.

14 CHAIRMAN WALLIS: The sand cushion is  
15 saturated with water first.

16 MR. ASHAR: Right.

17 MEMBER SIEBER: A number of plants have  
18 drains at the bottom of the sand --

19 MR. ASHAR: At the bottom --

20 MEMBER SIEBER: It would make more sense  
21 to --

22 MR. ASHAR: Some people have at the bottom  
23 of the sand pocket area drains with -- again,  
24 actually, it is to retain the sand inside. So that  
25 all flowing sand can be collected, but if they can use

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1 it at the --

2 MEMBER SIEBER: What is the purpose of the  
3 sand in the first place?

4 MR. ASHAR: Okay. See, this is the --

5 MEMBER SIEBER: Got a cushion?

6 MR. ASHAR: -- concrete area -- okay? --  
7 here. And this one when the shell expands under  
8 pressure --

9 MEMBER SIEBER: It is room to --

10 MR. ASHAR: -- it gives you some room to  
11 budge in.

12 MEMBER SIEBER: Expand? Okay. But the  
13 whole bottom of the shell sits on concrete? So you  
14 don't worry about corrosion below the sand?

15 MR. ASHAR: We do in some cases. We do to  
16 some extent, yes. If --

17 MEMBER SIEBER: How do you address that?  
18 You can't get to it because the top of it is concrete,  
19 too.

20 MR. ASHAR: If there is an appreciable  
21 collection of water in the sand bucket area, there is  
22 a chance that the water might have gone between the  
23 steel shell and the concrete.

24 MEMBER SIEBER: Right.

25 MR. ASHAR: But those cases, we have not

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1 found many so far except one, one case.

2 MEMBER SIEBER: You probably don't know --

3 MR. ASHAR: Yes, sir.

4 MEMBER SIEBER: -- you've got a concrete  
5 pad, a hemispherical pad, and then concrete above  
6 that.

7 MR. ASHAR: Right.

8 MEMBER SIEBER: And so there's no way to  
9 make a measurement.

10 MR. ASHAR: We know.

11 MS. TRAN: The interior.

12 MEMBER SIEBER: You can't get to the  
13 inside unless you cut the concrete out.

14 MR. ASHAR: Unless you cut the concrete or  
15 there are some new methods that have been developed in  
16 the NRC's research program, which have guided matters,  
17 but they are not yet being calibrated and haven't been  
18 used extensively by anybody.

19 So there are potential uses for those  
20 things under these examinations, but we have not seen  
21 them use it so far. We have just put one report from  
22 Oak Ridge National Lab in e-mail items so that people  
23 can look at that report and see if it is applicable  
24 for them.

25 CHAIRMAN WALLIS: Didn't someone yesterday

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1 say they actually made holes in that concrete in order  
2 to inspect?

3 MR. ASHAR: Yes.

4 MS. TRAN: Monticello.

5 MEMBER SIEBER: Next to the pedestal.

6 MR. ASHAR: Yes. They had to do that.

7 MEMBER SIEBER: But that is about as far  
8 as you can go because --

9 MR. ASHAR: That is as far as you can go  
10 right now, right.

11 MEMBER SIEBER: It's really thick in  
12 between.

13 MR. ASHAR: Yes. You can go up to here in  
14 the sand pocket area. Anything below that, if there  
15 is a --

16 MEMBER SIEBER: Of course, the sump is in  
17 there, too.

18 VICE CHAIRMAN SHACK: But typically,  
19 though, I mean, your experience is that there is no  
20 water there or that they all collect water?

21 MR. ASHAR: Typically the water has been  
22 very little. There has been water except in one case  
23 in the case of, I think it is, Dresden III, when they  
24 had to put firewater in here to extinguish a fire in  
25 the gravel area here --

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1 VICE CHAIRMAN SHACK: Well, that would do  
2 it.

3 MR. ASHAR: -- because of a summation  
4 fire. I don't know why.

5 MEMBER SIEBER: Good place to get a fire.

6 MR. ASHAR: But there was a fire there.  
7 They put a lot of water into it. And this whole area  
8 becomes soft here in the sand --

9 CHAIRMAN WALLIS: I'm interested to see  
10 when the sand gets full of water by some mechanism how  
11 it ever gets out. How does it ever get dry?

12 MR. ASHAR: With sand you --

13 CHAIRMAN WALLIS: If you had water access,  
14 suppose the bellows fails --

15 MR. ASHAR: Except the temperature --

16 CHAIRMAN WALLIS: -- water runs down.

17 MEMBER SIEBER: Aren't there drains at the  
18 bottom of this thing pushing it, right?

19 MR. ASHAR: Some have. This one is not  
20 shown here. There is a drain right here.

21 CHAIRMAN WALLIS: There is a drain there?

22 MR. ASHAR: There is a drain.

23 MEMBER SIEBER: Okay.

24 CHAIRMAN WALLIS: So that is how you draw  
25 out the sand? You just let it soak out?

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1 MEMBER SIEBER: It drips into where the --

2 MR. ASHAR: The temperature in the drywell  
3 in general in that area is close to about 130-140  
4 degrees. So it helps a little bit drying --

5 CHAIRMAN WALLIS: It evaporates the water?

6 MR. ASHAR: To some extent, not -- I mean,  
7 I have been given those explanations by various  
8 applicants, I know, what does this, but I do not  
9 believe everything they say. But --

10 CHAIRMAN WALLIS: Okay.

11 MS. TRAN: Slide five, please.

12 MEMBER SIEBER: You say the space between  
13 the concrete and the shell and the drywell is filled  
14 with insulation.

15 MR. ASHAR: Yes, there is insulation in  
16 there.

17 MEMBER SIEBER: What is it, some kind of  
18 fiber of some sort?

19 MR. ASHAR: I think so, yes. In one case  
20 we found that insulation was bad enough that it has  
21 chloride and all those contaminants. So when the  
22 water came in, it came with contaminated water. And  
23 that started accelerating the corrosion rate.

24 MEMBER SIEBER: That would do it. The  
25 insulation holds the water all up and down.

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1 MR. ASHAR: Up and down.

2 MR. GILLESPIE: Hans, I think it is  
3 important here that we're not talking in every case  
4 about any single containment.

5 MR. ASHAR: Right.

6 MR. GILLESPIE: What you have hit on is  
7 exactly what I tried to say in the beginning. The  
8 specific designs are so variant that we have really  
9 found out in doing these reviews that a Mark I  
10 containment is not a Mark I containment when you're  
11 looking at the drain details and the drain location.  
12 It's a function of the age, the AE. And, for example,  
13 Nine Mile actually put cameras up to ten-inch drains  
14 that they have and looked up in there, and it was  
15 dust.

16 And so before we assume that this thing is  
17 always full of water on everyone, there is a great  
18 variance between each unit. The design is different.  
19 And what licensees have done in the past to verify  
20 either the presence or absence of water is very  
21 different.

22 And so it's not like there is a universal  
23 answer to each one of these. Each one really is  
24 different.

25 VICE CHAIRMAN SHACK: Now, again, just on

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1 that, are all of the ones filled with insulation or  
2 are some of them actually air gaps?

3 MEMBER ARMIJO: I thought Monticello was  
4 an air gap based on yesterday's presentation.

5 MR. ASHAR: It is called air gap. I mean,  
6 in general, the terminology used is air gap.

7 VICE CHAIRMAN SHACK: But, I mean, is it  
8 typically filled with insulation?

9 MR. ASHAR: Typically it is a concrete  
10 General Electric design. It has the insulation in  
11 most cases. There might be a plant or two that may  
12 not have it available, but there might be some plants.

13 MEMBER SIEBER: You almost need it to be  
14 the form for pouring the concrete.

15 MR. ASHAR: Right, exactly.

16 MEMBER SIEBER: You need something in  
17 there to do that. Otherwise you don't have a gap at  
18 all. And one of the ways you get water down there is  
19 you have to take that refueling seal out after you  
20 refuel in order to put the drywell back together. And  
21 the process of doing that leaves a lip of water --

22 MR. ASHAR: Right.

23 MEMBER SIEBER: -- all around where the  
24 seal --

25 MR. ASHAR: Right.

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1                   MEMBER SIEBER:  -- used to be.  It can  
2 only go down.

3                   CHAIRMAN WALLIS:  Now, we had a plant  
4 recently which had bulges in this realignment.

5                   MR. ASHAR:  I want to clarify two things.  
6 Okay?

7                   CHAIRMAN WALLIS:  It was Brunswick.

8                   MR. ASHAR:  There is a problem with the  
9 terminology.  The first thing, when we talk about the  
10 drywell shell, it is a freestanding drywell steel  
11 shell.  And when we talk about the liner, it is  
12 attached to concrete with some kind of anchorages.

13                   And that is where we use the word "liner."  
14 But I have seen people using very loosely "drywell  
15 liner" here.  It is not true.  Okay?  We are going to  
16 clarify the terminology in the next -- there is no --

17                   MEMBER SIEBER:  The one plant that has the  
18 liner, the shell, the structural member is the  
19 concrete, the subject of the code.

20                   CHAIRMAN WALLIS:  Yes, that's right.

21                   MEMBER SIEBER:  So you can tolerate some  
22 amount of corrosion as long as you --

23                   CHAIRMAN WALLIS:  So the liner just sits  
24 on the --

25                   MEMBER SIEBER:  -- maintain tightness.

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1 CHAIRMAN WALLIS: Okay. So the liner sits  
2 on the concrete, which is why it bulges.

3 MEMBER SIEBER: Just in that one plant.

4 CHAIRMAN WALLIS: This one is  
5 freestanding, this one.

6 MEMBER SIEBER: Yes.

7 MR. ASHAR: The one we are showing is a  
8 freestanding shell plus the liner.

9 MS. TRAN: Okay. Slide five. For some  
10 applications, just the information provided was  
11 included in the various sections of the LRA. And for  
12 other applications, the information was obtained to  
13 request for additional information.

14 As a result, the proposed ISG recommended  
15 that future applicants provide a plant-specific aging  
16 management program that would address the loss of  
17 material for the accessible area of the drywell shell.

18 So the recommendations that the applicant  
19 should be included in there, in the aging management  
20 program to develop a corrosion rate that is really  
21 inferred from past UT excaination or esatlibsh a  
22 corrosion rate using representative samples in similar  
23 operating conidtion.

24 CHAIRMAN WALLIS: I would think the  
25 corrosion rate was so low that it would be difficult

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1 to measure. Really, you could say that it's less than  
2 a certain amount.

3 MS. TRAN: Less than, then. No minimum  
4 design.

5 CHAIRMAN WALLIS: That's good enough. You  
6 don't actually want them to determine what it is  
7 because you might be so low that you can't measure it.  
8 But if it's less than a certain amount, that would be  
9 acceptable, wouldn't it?

10 MR. ASHAR: In general, subsection IWE of  
11 the ASME code allows close to about ten percent  
12 allowance --

13 CHAIRMAN WALLIS: I know, but --

14 MR. ASHAR: -- some localized corrosion.

15 CHAIRMAN WALLIS: But if there is no water  
16 there, the corrosion rate may be essentially zero.

17 MS. TRAN: Correct.

18 CHAIRMAN WALLIS: And so establishing a  
19 zero thing is very difficult to do.

20 MEMBER SIEBER: Really, what you are  
21 trying to do is to determine how close you are to  
22 min wall.

23 MR. ASHAR: The min wall, right, minimum  
24 wall.

25 MEMBER SIEBER: And by plotting the

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1 reduction in thickness, you can determine when you are  
2 going to hit min wall. At that point you no longer  
3 meet the code for that pressure vessel.

4 VICE CHAIRMAN SHACK: How do I do this?  
5 Do I have to have multiple UT readings from that  
6 inaccessible portion of the shell? Can I demonstrate  
7 that mine is always dry?

8 MEMBER MAYNARD: You could develop a way  
9 that you had data from the --

10 MR. ASHAR: Two in the same location.

11 MEMBER MAYNARD: If an applicant comes in  
12 and they don't have previous data, I'm not sure how  
13 they develop a rate.

14 MS. TRAN: This is what we learned in  
15 putting this together. They will have one point at  
16 the beginning, you know, the design of the fabrication  
17 point. And then as a result of generic letter 87-05,  
18 most applicants, I mean, yes, have another data point.  
19 So when using that, they could develop some kind of --

20 VICE CHAIRMAN SHACK: Again, that is very  
21 specific. How many data points did they take when  
22 they made those UT measurements? How many locations?

23 MS. TRAN: Eighty-seven? Do you know?

24 MR. ASHAR: Yes. Generally in response to  
25 87-05, a number of -- now I have to say licensees, not

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1 applicants -- licensees have taken that kind of  
2 approach that they will look at four points in four  
3 sectors --

4 VICE CHAIRMAN SHACK: Four quadrants.

5 MR. ASHAR: -- because they don't remove  
6 the sand. They just have the sand. It's not like  
7 Oyster Creek. So what they do is they chip out the  
8 concrete in certain areas and then take the  
9 measurements and in response to 87-05.

10 And the second reading they take is two  
11 years or so after. That gives them a closer rate at  
12 the same location. It isn't delicate science that,  
13 hey, something is going on. Then they do more work.

14 VICE CHAIRMAN SHACK: Now, again, from  
15 Monticello, they don't seem to have maintained those  
16 as access ports.

17 MEMBER SIEBER: No.

18 MR. ASHAR: No, they don't. I mean, they  
19 can get to it if they have to, but they don't maintain  
20 them because they --

21 MEMBER SIEBER: That becomes another  
22 pocket for corrosion --

23 MR. ASHAR: Yes, right. It becomes --

24 MEMBER SIEBER: -- because there is  
25 moisture inside the containment.

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1 MR. ASHAR: Right.

2 MEMBER SIEBER: In the sump is actually  
3 that floor there. The sump is built into the floor.  
4 And so every loose water, amount of water, ends up in  
5 that space where the drywell liner and the concrete  
6 meet.

7 So they have to fill it up. They have to  
8 do something. Otherwise you would have a pocket of  
9 water sitting there.

10 CHAIRMAN WALLIS: I am still a little  
11 puzzled. I would think that the corrosion rate is so  
12 low that it's within the uncertainty in the ultrasound  
13 measurements.

14 MR. ASHAR: If it is low, they will report  
15 as low.

16 MS. TRAN: At least we will have --

17 MEMBER SIEBER: Carbon steel water and --

18 CHAIRMAN WALLIS: There's no water there.

19 MR. GILLESPIE: As it happens with real  
20 applicants, we're looking at corrosion rates like 17,  
21 18 ml a year in some cases.

22 CHAIRMAN WALLIS: There is water there.

23 MR. GILLESPIE: Well, yes. And people are  
24 seeing some evidence of corrosion. In another case,  
25 Nine Mile case, they did these measurements. And then

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1 they have a high-corrosion area on mild carbon steel  
2 at the water line in the Torus.

3 And what they did was they took that rate  
4 as a conservative estimate, where they know water is,  
5 and applied it to their liner and say, "Okay. We've  
6 got 38 years to go here."

7 And so people actually have come up with  
8 ways given these points and other representative  
9 carbon steel areas within their area that they do  
10 measure because they're in harsher environments and  
11 applied that as a representation to this in order to  
12 show that they could make it past the renewal period  
13 or at least until the next measurement that they might  
14 commit to take.

15 And so so far each licensee that we have  
16 had an opportunity to both finish our review or  
17 interface with so far has actually been extremely  
18 consistent with this position. And so they have  
19 actually figured out how to do it.

20 And there is other carbon steel in the  
21 Torus, actually in a wet environment, which gives you  
22 a noticeable rate, as it happens, particularly where  
23 some of the liners have blistered and bubbled, which  
24 is a whole other issue, that they can apply to this.

25 It's a conservative application. You

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1 know, if it doesn't work, then they have to do  
2 something else to convince us that the rate is okay.

3 So when we talk the nebulous philosophy,  
4 it gets harder, but I think when you get to specific  
5 plant situations, pardon the pun, but it's concrete.  
6 And so they have kind of come up with ways to use the  
7 generic point, the generic letter issue points.

8 In fact, in Vermont Yankee's case, they  
9 actually had leakage and did extra measurements  
10 consistent with the ISP, which wasn't issued when they  
11 did this some years ago. And so they have preserved  
12 those extra points.

13 And so it just happens that these plants  
14 actually have this information sitting there. They  
15 just haven't used it in this application before. And  
16 this is clarifying. We expect you to use it in this  
17 application.

18 Go ahead, Linh.

19 MS. TRAN: I guess now where degradation  
20 has been identified in accessible area of the drywell,  
21 meaning in the interior area of the drywell, the  
22 applicant should provide an evaluation that would  
23 address the condition of the inaccessible area of a  
24 similar condition or find something in the interior  
25 area. They should have an evaluation for that.

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1 Now, to assure --

2 MEMBER APOSTOLAKIS: How does one do that?

3 MR. ASHAR: Let me. The actual, this is  
4 just what we have seen.

5 MEMBER APOSTOLAKIS: That's okay. You  
6 don't have to show it.

7 MR. ASHAR: Okay. This is the requirement  
8 we set in after when we endorsed IWE, IWL into  
9 50.55(a) in the rule, that if they find something in  
10 the accessible area, they ought to go and look in the  
11 surrounding inaccessible area to see if there is  
12 anything going on.

13 A lot of PWR licensees, for example, have  
14 found that at the junction of the steel liner of the  
15 concrete containment and the concrete floor, they have  
16 moisture barriers generally. And their moisture  
17 barrier gets damaged. The borated water many times go  
18 in. And it starts corroding the inside area. It  
19 shows up a little bit on the upper side.

20 So they would do examination and find out  
21 what is going on. And they find the moisture barrier  
22 could be the culprit. They have to change the  
23 culprit. They ought to go inside. They ought to take  
24 out the corrosion.

25 So that's the reason this problem has been

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1 in about the inaccessible. In accessible area you  
2 have corrosion. You would look into the joining  
3 inaccessible area to find every --

4 MEMBER APOSTOLAKIS: You will look into  
5 the inaccessible area. That helps make it accessible  
6 or not?

7 MR. ASHAR: No. If you see some rusting  
8 or something on the --

9 MEMBER APOSTOLAKIS: You can look at it.  
10 Why isn't it accessible?

11 MR. ASHAR: No, no. The whole area is  
12 that you see something in an accessible area. And  
13 they investigate as to what is going on underneath  
14 that particular area. The basic focus in the room was  
15 the PWR containments. That is where it was found in  
16 so many of them. And still we are finding it.

17 MEMBER ARMIJO: But it is possible you  
18 could have damage occurring in an inaccessible area  
19 and have nothing in the accessible.

20 MR. ASHAR: That's quite right.

21 MEMBER SIEBER: Possible.

22 MR. ASHAR: That is why this type of --

23 MEMBER ARMIJO: Very possible. I mean,  
24 it's --

25 MS. TRAN: That is why we use accessible

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1 area as the indication for the accessible area for the  
2 augmented inspection. They have to do visual in the  
3 surface. And then if the surface area is accessible  
4 only from one side and they have to protect the wall  
5 thing by using ultrasonic --

6 MEMBER ARMIJO: I don't worry about the  
7 accessible. I just worry about the inaccessible and  
8 having no way of knowing just by looking at the  
9 accessible area. It's not a good --

10 MR. ASHAR: That is where this ISG kicks  
11 in because this ISG is focused on inaccessible area.  
12 This is one of the pointers, that if there is  
13 something going on in the accessible area, which you  
14 can see right away, then there is something going on  
15 and you will look at it.

16 MEMBER ARMIJO: That is the easy part.

17 MR. ASHAR: The ISG concentration, focus  
18 of this ISG, is the inaccessible areas.

19 MEMBER APOSTOLAKIS: But how does one  
20 suspect?

21 CHAIRMAN WALLIS: Yes, that's right. How  
22 does one suspect?

23 MEMBER APOSTOLAKIS: How do you suspect?

24 MS. TRAN: You find water or leakage on  
25 your --

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1 MEMBER APOSTOLAKIS: That is getting back  
2 to what Dr. Armijo is saying. That's not our worry.  
3 What if you don't find water? You still make some  
4 problem in the inaccessible area. Is that correct?

5 MEMBER ARMIJO: Yes, you could.

6 MEMBER APOSTOLAKIS: So how does one  
7 suspect that something is going on in the inaccessible  
8 area?

9 MEMBER BONACA: No. She says water.

10 MS. TRAN: Water is one. If you find  
11 water in the drain lines, water in the drain line, in  
12 the --

13 MEMBER BONACA: For example, if the seals  
14 -- I guess you are focusing on the seals and on the  
15 bellows, right?

16 MR. ASHAR: Right.

17 MEMBER SIEBER: The only way you can get  
18 water into the inaccessible area is to have it flow  
19 through the accessible area. So if you make a  
20 measurement in the accessible area --

21 MEMBER APOSTOLAKIS: Okay. That is a  
22 different --

23 MEMBER SIEBER: -- that gives you some  
24 kind of justification to extrapolate to the area you  
25 get.

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1 MEMBER APOSTOLAKIS: But that doesn't help  
2 much because it could have run down --

3 VICE CHAIRMAN SHACK: The water runs down  
4 and collects at the --

5 MEMBER SIEBER: Right.

6 VICE CHAIRMAN SHACK: It doesn't stay on  
7 the side of the --

8 MEMBER BONACA: That is why the real focus  
9 is the last bullet. And that's what they attempted to  
10 do, you know, to put in the seals and the bellows in  
11 the scope of license renewal. And this has been kind  
12 of debated with the industry.

13 CHAIRMAN WALLIS: This is a very weak  
14 statement, "if moisture is suspected." That's a very  
15 subjective --

16 MS. TRAN: Or detected.

17 CHAIRMAN WALLIS: If you have a suspicious  
18 nature, you would suspect it all the time.

19 MR. ASHAR: Subsection IWE in its  
20 IWE-1240, there's a number of items. This is the  
21 abbreviated form. A number of places where this could  
22 occur is very vividly described in there, IWE-1240 in  
23 the ASME code. And that is what we are invoking, but  
24 we did not write everything that is written in the  
25 IWE-1240.

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1 MEMBER APOSTOLAKIS: Now, you are really  
2 including SSCs that are identified as source of  
3 moisture and scope, source of moisture?

4 MR. ASHAR: Yes. For example, cracking of  
5 bellows.

6 MEMBER SIEBER: The refueling seal.

7 MR. ASHAR: I explained to you earlier.

8 MEMBER APOSTOLAKIS: Okay. That's what --

9 MS. TRAN: The refueling seal is not.

10 MR. ASHAR: Refueling seal.

11 MS. TRAN: So they have to put that in the  
12 scope of license renewal.

13 MR. ASHAR: This is what we are --

14 MEMBER APOSTOLAKIS: Okay.

15 CHAIRMAN WALLIS: Why don't they just  
16 require that they check the bellows for cracks  
17 routinely?

18 MR. ASHAR: It is not very easy to get to  
19 it. They can do tests. That's what they do most --

20 MEMBER SIEBER: It not the only place it  
21 can leak.

22 MR. ASHAR: Yes. And I say --

23 MEMBER SIEBER: They can leak along the  
24 edge.

25 MR. ASHAR: Yes. And this is what we want

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1 to have them in the scope of license renewal, so they  
2 maintain them in a condition where it is not leaking.

3 MEMBER MAYNARD: Well, by "suspected"  
4 here, don't you really mean if there has been some  
5 previous evidence that moisture has been there? You  
6 know, I suspect. I have a hard time dealing with what  
7 I might suspect, but I can deal with whether I have  
8 had any indications or evidence.

9 MS. TRAN: Yes. This is "suspect" or  
10 "detected" through your drain lines.

11 CHAIRMAN WALLIS: Well, if moisture is  
12 detected, now, that makes sense.

13 MEMBER MAYNARD: Yes.

14 MS. TRAN: It should be "detected,"  
15 instead of "suspected."

16 VICE CHAIRMAN SHACK: So if moisture has  
17 been detected any time in the life of this plant up  
18 until license renewal included? Is that what it says?

19 MEMBER APOSTOLAKIS: It is not really  
20 detected. Go ahead. You answered my question.

21 CHAIRMAN WALLIS: Well, just take out the  
22 "if" clause and say, "include."

23 VICE CHAIRMAN SHACK: Yes. Why not just  
24 include them?

25 MEMBER APOSTOLAKIS: I think "suspected"

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1 is broader because would that include a situation  
2 where you have seen moisture or water in a similar  
3 facility and you suspect it may happen in yours, even  
4 though you hadn't seen it? "Suspected" is broader.

5 MEMBER MAYNARD: Well, yes, but I think  
6 from a regulatory standpoint and from dealing with  
7 licensees, I think you need a little bit better  
8 definition rather than it just being somebody's  
9 opinion sitting there saying, "Well, I suspect there  
10 might be something there."

11 CHAIRMAN WALLIS: Suspected by whom?  
12 Inspector or is it --

13 MEMBER MAYNARD: Well, I like the  
14 "detected" or --

15 MS. TRAN: Detected. I think --

16 MEMBER BONACA: We had a discussion  
17 yesterday at Monticello that shows how difficult the  
18 issue is. I mean, we rely very much on subjective  
19 judgments and say, "Well, we don't think we ever had  
20 water."

21 CHAIRMAN WALLIS: You could simply say  
22 that "The ACRS suspects that there may always be water  
23 there. Therefore."

24 MEMBER APOSTOLAKIS: You guys must have  
25 had a hell of a meeting yesterday.

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1 VICE CHAIRMAN SHACK: In Monticello's  
2 case, they see no evidence of corrosion in '87, which  
3 was a fairly substantial operating period for them.

4 MEMBER APOSTOLAKIS: That's right.

5 MS. TRAN: Identified.

6 MEMBER ARMIJO: If they have good records,  
7 they have a good sound --

8 VICE CHAIRMAN SHACK: One data point.

9 MR. ASHAR: We have to draw things --

10 MEMBER ARMIJO: They don't have to do it.

11 MS. TRAN: So just to get back on --

12 CHAIRMAN WALLIS: You really fixed this  
13 up.

14 VICE CHAIRMAN SHACK: Why not just put  
15 these seals in scope and be done with it?

16 MR. ASHAR: This is what we tried to do  
17 earlier. And there is so much resistance from a  
18 number of applicants. I mean, I had to go to three or  
19 four RAIs over and above a lot of teleconferences to  
20 convince them to put this in the scope of license  
21 renewal. And so many people denied.

22 CHAIRMAN WALLIS: So now you have to  
23 convince them to suspect something?

24 MR. ASHAR: No. Now, with this ISG, if  
25 they have suspected sites, areas, then --

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1 CHAIRMAN WALLIS: But they don't want to  
2 do it anyway. They'll never suspect anything.

3 MEMBER APOSTOLAKIS: No. Presumably there  
4 will be some guidance what suspicion means.

5 MR. ASHAR: There is a guidance.

6 MEMBER APOSTOLAKIS: Yes.

7 MR. ASHAR: There is.

8 CHAIRMAN WALLIS: There must be.

9 MEMBER APOSTOLAKIS: It just doesn't say  
10 it in bullets.

11 MS. TRAN: Yes.

12 MR. ASHAR: I was looking for IWE-1240  
13 here. I don't have one.

14 CHAIRMAN WALLIS: Okay.

15 MR. ASHAR: But that is where it is fully  
16 described as to -- this is what we are invoking here  
17 basically.

18 CHAIRMAN WALLIS: You want to say  
19 something, "if there are indications of moisture" or  
20 something like that.

21 MR. KUO: If I may, Part 54 rule in the  
22 rule language in the SOC discussed this, saying if a  
23 component is in an environment that could have aging  
24 effect, say in the operating experience, anywhere in  
25 the industry or your specific plant, that there is

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1 such a degradation mechanism, degradation mechanism  
2 that could cause an aging effect, then an aging  
3 management program should be provided. That's what  
4 the Part 54 rule requires.

5 In other words, if this is a possible  
6 aging effect from the operating experience, then that  
7 is suspected. You would use the word "suspect." That  
8 happened before. We should not talk about the  
9 hypothetical aging effect, but it is an aging effect  
10 that we have seen before.

11 VICE CHAIRMAN SHACK: Right. That is why  
12 I can't understand why you can't just put the seals in  
13 scope. I mean, it's not a hypothetical event.

14 MR. KUO: Like Hans said, some people  
15 don't want to include the seal in the scope.

16 CHAIRMAN WALLIS: There are often people  
17 who don't want to do things, but you can say, "Do it."

18 MEMBER BONACA: What you want and what you  
19 get are two different things.

20 MR. GILLESPIE: I think you will find as  
21 a result of this ISG, fundamentally seals are in  
22 scope. Remember, seals and the refueling stuff are  
23 not safety basically. And so what we're doing is  
24 because of the effect of non-safety components on a  
25 safety component, we're bringing them into scope. So

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1 it's a bit indirect.

2 And so it shouldn't be a surprise that  
3 utilities don't want extra requirement on things that  
4 don't have any requirements on them now.

5 MEMBER BONACA: But, you know, one thing  
6 that we are learning from this license renewal process  
7 as we converge, it seems to me that the central issues  
8 are becoming the inaccessible or buried components  
9 that you can't look at, that you cannot measure. And  
10 that's natural because, I mean, these plants are going  
11 beyond some original design in certain components of  
12 the -- and I think that it is important that we focus  
13 on these inaccessible components and ask our  
14 questions, you know, how long can this live and what  
15 is the source of the problem. And here -- anyway --

16 MS. TRAN: Hans wanted me to read the  
17 IWE-1241, the examination surfaces, "Surface area for  
18 the typical location," "Typical location of such areas  
19 of those exposed to stand-in water, repeated wetting  
20 and drying, persistent leakage, and those with  
21 geometries that permit water accumulations,  
22 condensation, and biologicals attack." I mean, it is  
23 in the -- it tells the applicant the area.

24 Now, let's say if moisture is detected as  
25 suspected or identified --

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1 (Laughter.)

2 MS. TRAN: Now, we will agree that they  
3 found water. Okay? So they should include the  
4 component, the source of it, in the scope of license  
5 renewal. In addition, we need to identify the surface  
6 area.

7 Next slide. By implementing and  
8 augmenting inspection for the period of extended  
9 operation in accordance with the ASME section 11,  
10 subsection IWE and also for the examination shall be  
11 in accordance with section 11, subsection IWE-2500.  
12 And I did go over that a little bit earlier.

13 That means that surface area accessible  
14 from both sides should be visually examined and  
15 surface area that is only accessible from one side  
16 should be examined for wall thinning and using sonic  
17 thickness measurement method.

18 Now, after all of that, after all of the  
19 augmented inspection, the applicant should demonstrate  
20 that either corrosion is not occurring by performing  
21 those examinations or analysis to do analysis on the  
22 result or that corrosion is progressing so slowly that  
23 the age-related degradation will not jeopardize the  
24 intended function of the drywell to the period of  
25 extended operation.

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1 VICE CHAIRMAN SHACK: Just how thick is  
2 this light bulb again?

3 MR. ASHAR: The light bulb? It varies.  
4 From the top, it is thinner, very thin, right around  
5 half-inch to three-quarter-inch. As you go down near  
6 the knuckle area between the sphere and the upper  
7 part, it is spherical area. It is close to about .7,  
8 .6 inches. Then it again goes down up to six inches.  
9 And then at the bottom area is about one to one and a  
10 half inches in between the sand pocket area --

11 VICE CHAIRMAN SHACK: No. But, I mean,  
12 it's 17 ml a year.

13 MR. ASHAR: Oh, yes.

14 VICE CHAIRMAN SHACK: You're going to chew  
15 that at a pretty good clip.

16 MEMBER BONACA: If you find a hole in the  
17 liner, I mean, would you suspect some moisture there?  
18 I mean, what is --

19 CHAIRMAN WALLIS: Even my chassis of my  
20 car, which is soaked in salt, doesn't corrode at 17 ml  
21 per year, does it? It's really bad conditions if  
22 you've got --

23 MR. GILLESPIE: Yes. That actually is the  
24 two worst points that a particular --

25 CHAIRMAN WALLIS: Yes, very bad --

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1 MR. GILLESPIE: -- that they reported to  
2 us. What it does do, though, is say there is  
3 operating history out there in this utility  
4 environment, that we cannot take for granted that it  
5 can't happen.

6 CHAIRMAN WALLIS: Right.

7 MR. GILLESPIE: And that's the reason for  
8 the ISG. We are not going to make the assumption  
9 because we have operating history that says it's not  
10 necessarily a valid assumption in all cases that it's  
11 going to go slow. There has been evidence of this  
12 going faster than people would have originally  
13 anticipated in the designs.

14 MEMBER BONACA: But in some cases where we  
15 have questioned the bellows, particularly the seals,  
16 if you're in seals, then the answer is always, well,  
17 we have good drainage. So you are in a quandary. I  
18 mean, what leads you --

19 MR. ASHAR: There are a number of things  
20 that tells us. The first thing, the drains are not  
21 clogged any time in the past. The second thing,  
22 visual examinations performed in the areas, it was  
23 shown there are no telltale signs of water for a  
24 number of inspections there performed. Then they had  
25 to show us at the bottom in the drain line there was

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1 no water coming out anywhere.

2 So there are so many things that they  
3 would tell us before they convince us that there is  
4 nothing going on.

5 MR. GILLESPIE: Mario, I would also say  
6 that I think this came up in Monticello's case  
7 yesterday, --

8 MR. ASHAR: Right.

9 MR. GILLESPIE: -- where they didn't take  
10 credit for it, but they actually had a primer sprayed  
11 on the outside of the inaccessible area. And other  
12 licensees have different applications of codings on it  
13 also.

14 And so it's not one thing.

15 MEMBER BONACA: Yes, I know, but --

16 MR. GILLESPIE: Aging management is  
17 accumulation of codings, time of exposure, amount of  
18 water.

19 MEMBER BONACA: And the spray on the  
20 surface was 65 or 40 years ago practically, 1965. So,  
21 you know, right. I understand.

22 MR. GILLESPIE: But the environment is not  
23 such that there is anything in there to actually cause  
24 the paint to peel off either. So there's no one issue  
25 here.

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1 MEMBER BONACA: Yes. I understand.

2 MR. GILLESPIE: It's different pieces to  
3 try to give you reasonable assurance.

4 MEMBER BONACA: In fact, yesterday at the  
5 end of the conversation, it was the lady who was  
6 performing the inspections felt confident with that.  
7 I'm sure that if you go physically and look at it and  
8 get information, you know, you can build a credible  
9 case that there is no concern with moisture. So I  
10 accepted that yesterday.

11 MEMBER ARMIJO: But a case has to be made  
12 --

13 MEMBER BONACA: Yes, it does.

14 MEMBER ARMIJO: -- with documented data,  
15 not just --

16 MEMBER BONACA: Right.

17 MEMBER MAYNARD: Is there something that  
18 is done periodically to ensure that these drains are  
19 really open, like particularly the sand point drains  
20 and stuff, that they're not plugged in some way?

21 MR. ASHAR: Now they are committing to  
22 those things. They have ensured those things, yes.

23 VICE CHAIRMAN SHACK: You'll find out when  
24 you have a leak.

25 MEMBER SIEBER: A sand pocket drain is a

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1 four-inch pipe. So they're hard to plug.

2 VICE CHAIRMAN SHACK: Yes.

3 MEMBER BONACA: I believe we have also  
4 some comments from the industry.

5 MS. TRAN: Right. Yes.

6 MEMBER BONACA: So shortly we'll get to  
7 those.

8 MS. TRAN: I am almost done. Now, if the  
9 intended function of the drywell cannot be met, the  
10 applicant can identify actions that will be taken as  
11 part of the aging management program to ensure that  
12 the integrity of the drywell would be maintained  
13 through the period of extended operation.

14 Last slide. Now, the drywell shell  
15 concern has already been addressed for the reactor's  
16 initial 40 years' licenses and relevant plants that  
17 have received a renewal license, as indicated in the  
18 left column there.

19 Now, the staff is in the process of  
20 reviewing the plants in the middle column. And the  
21 third column represented the remainder of the plants  
22 with the Mark I steel containment design.

23 Not all the plants in the third column,  
24 however, have announced their intention to renew their  
25 license, but the future review that's listed on the

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1 right side.

2 This concludes my presentation. So we can  
3 entertain any additional questions that you might  
4 have.

5 MEMBER BONACA: You don't have to request  
6 questions.

7 CHAIRMAN WALLIS: Ell, I suspect there  
8 might be some more questions.

9 (Laughter.)

10 MEMBER SIEBER: I don't know what they  
11 would be that we haven't already asked.

12 MEMBER BONACA: Any additional questions?

13 (No response.)

14 MEMBER BONACA: None. So we thank you for  
15 a very good presentation.

16 MS. TRAN: Thank you.

17 CHAIRMAN WALLIS: You have been here all  
18 day, Alex.

19 MR. MARRION: I know. Can I get one of  
20 those little name tag things? I'll just put it on.

21 (Laughter.)

22 MR. MARRION: Good afternoon. My name is  
23 Alex Marrion. I'm Senior Director of Engineering with  
24 NEI. And with me I have James Ross, who is the senior  
25 project manager with lead responsibility for license

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1 renewal. He's here to keep me out of trouble. He  
2 should have been here earlier.

3 I just want to make a couple of general  
4 comments. Based upon comments that the NRC made about  
5 the uniqueness of the specific plant designs, we feel  
6 that this is not really a generic issue, but it's  
7 appropriate to address it on a plant-specific basis in  
8 accordance with the uniqueness of the designs. And I  
9 think Frank Gillespie brought that up.

10 This is not a new issue. It's been  
11 addressed by the licensees in the past. There was a  
12 generic letter, 8705. And inspection requirements  
13 were incorporated into NRC regulations when NRC  
14 endorsed the ASME code subsection IWE as part of an  
15 update of 10 CFR 50.55(a).

16 Because that was already regulatory  
17 requirements, utilities were resisting the idea of  
18 imposing an additional regulatory requirement given  
19 that there wasn't sufficient evidence to indicate that  
20 the current requirement was not adequate if that makes  
21 sense.

22 The particular interim staff guidance is  
23 out for comment. Right now comments are due the 8th  
24 of June. We intend to submit comments on behalf of  
25 the industry.

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1           Most of the comments will be of a  
2 clarifying nature to make sure we understand the  
3 language, et cetera, which brings me to a more generic  
4 communication process issue. You know how I feel  
5 about generic communications based upon comments I  
6 made earlier.

7           The one thing that is not clear to us as  
8 an industry is why there is a need for an ISG process  
9 to begin with given that the NRC already has a  
10 well-established generic communication process that  
11 could be used as a vehicle for communicating staff  
12 guidance going forward.

13           So now we have generic communications.  
14 And we also have interim staff guidance, two separate  
15 processes that basically overlap. So we're going to  
16 continue making that point with every opportunity we  
17 have.

18           Lastly, I understand some question has  
19 been raised about the idea of continuing or the idea  
20 of imposing ultrasonic testing requirements. I want  
21 to make it clear that the current requirements that we  
22 currently have are for a graded approach to a visual  
23 examination.

24           And depending upon what you find, you do  
25 a more comprehensive examination, but the first step

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1 is a visual. And that's basic --

2 CHAIRMAN WALLIS: How do you visually  
3 inspect these inaccessible areas?

4 MR. MARRION: Well, as you heard from the  
5 staff, you do an examination of the inaccessible areas  
6 based upon what you find of the accessible areas if I  
7 have characterized it properly in what the staff was  
8 proposing.

9 And for the Mark I's, we intend to  
10 continue that process going forward. And we will be  
11 commenting accordingly on the ISG comments.

12 CHAIRMAN WALLIS: You have to be able to  
13 access some place which is relatively typical of the  
14 inaccessible places in order to do that.

15 MR. MARRION: Yes. I'm not familiar with  
16 the details of what that is, yes.

17 That's all I have, sir.

18 MEMBER ARMIJO: I just think that is  
19 fundamentally unsound because you have, really, a  
20 crevice condition in that sand pocket area. It's not  
21 at all represented by the accessible area.

22 And so looking at a safe location to make  
23 a judgment of a susceptible location seems to me a  
24 waste of time. I mean, if the accessible area is  
25 highly corroded, you can be sure that the inaccessible

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1 is in bad shape.

2 MR. MARRION: Right.

3 MEMBER ARMIJO: But the converse isn't  
4 true.

5 MEMBER APOSTOLAKIS: But didn't Jack say  
6 that for the water to get to the inaccessible area, it  
7 has to go through the accessible areas?

8 MEMBER ARMIJO: Yes, but it doesn't stay  
9 there.

10 VICE CHAIRMAN SHACK: It doesn't stay  
11 there.

12 MEMBER ARMIJO: It flows.

13 VICE CHAIRMAN SHACK: You have got a drain  
14 right at that thing. I mean, there is no way for  
15 water to really accumulate --

16 MEMBER APOSTOLAKIS: It is not  
17 accumulating.

18 VICE CHAIRMAN SHACK: -- in that  
19 accessible area.

20 CHAIRMAN WALLIS: But it gets to the sound  
21 --

22 MEMBER APOSTOLAKIS: But you are going to  
23 see some moisture or something.

24 MEMBER ARMIJO: You can make a case that  
25 if it's always been dry, that's your best case. You

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1 have good data.

2 MEMBER MAYNARD: I thought part of that,  
3 it would depend on what you include as a visual area  
4 for what you base -- if you're including the drains  
5 and if there is any moisture coming out of the sand  
6 drains or anything like that, well, that might be  
7 appropriate. But if you're saying that all you have  
8 to do is just visually look at the inside of the  
9 container there, that you don't have to do anything  
10 else.

11 But if you include as part of what you  
12 find visually results of drains and other things --

13 MR. MARRION: That is a comprehensive  
14 examination requirement that's in 50.55(a) right now.

15 Thank you. And I appreciate the time I  
16 spent with this illustrious body today.

17 (Laughter.)

18 MEMBER KRESS: We are honored to have you.

19 MEMBER BONACA: If there are no further  
20 questions, first of all, I want to thank the staff for  
21 their presentations and for the information. And then  
22 I'll turn the meeting back to you, Chairman.

23 CHAIRMAN WALLIS: Thank you very much.

24 We are finished with our formal  
25 presentations for the day.

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1 MEMBER KRESS: We don't have a letter on  
2 this particular issue?

3 MEMBER BONACA: No.

4 MEMBER KRESS: This was just a briefing?

5 CHAIRMAN WALLIS: Just a briefing. It was  
6 just a briefing.

7 MEMBER BONACA: There is no impact  
8 because, I mean, it was helpful because, again,  
9 yesterday we had a --

10 CHAIRMAN WALLIS: We don't need that --

11 MEMBER KRESS: Are we going to give some  
12 feedback now or anything on what we've heard or do you  
13 think the questions are sufficient?

14 VICE CHAIRMAN SHACK: The questions were  
15 sufficient.

16 CHAIRMAN WALLIS: Unless you have another  
17 point you want to make. Do you want to make some  
18 point?

19 MEMBER KRESS: Well, my point was that I  
20 just don't like this round-about way of doing things  
21 in the sense that I think there's a fatal flaw in  
22 trying to use the accessible areas to determine  
23 whether or not there is a problem in the inaccessible  
24 areas.

25 I would do what Bill Shack just said. Why

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1 not just include those sources of moisture within the  
2 scope?

3 VICE CHAIRMAN SHACK: Well, I think --

4 MEMBER KRESS: I know it has been resisted  
5 by the industry, but it doesn't seem like that big of  
6 a burden to me. I think that's the real solution.  
7 And that's what they're after, but they're trying to  
8 do it in a round-about way.

9 VICE CHAIRMAN SHACK: I also think a  
10 techie could come up with a way to measure those  
11 thicknesses.

12 MEMBER KRESS: Show me that way, and that  
13 may be okay. That's possible.

14 MEMBER SIEBER: Well, when you put the  
15 refueling seal in the scope, all you're doing is  
16 establishing an aging management program for that.  
17 That doesn't prevent leakage necessarily because there  
18 may be something other than the aging that causes the  
19 leaking.

20 MEMBER KRESS: Okay. Maybe. Maybe I am  
21 flawed.

22 MEMBER SIEBER: You could twist it, and  
23 now it leaks.

24 CHAIRMAN WALLIS: You should probably  
25 inspect a more susceptible area, which is a sand

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1 pocket.

2 MEMBER SIEBER: I think you have to deal  
3 with the --

4 MEMBER BONACA: In the past we left it to  
5 the --

6 MEMBER SIEBER: -- rather than deal with  
7 something that is removed from it.

8 MEMBER BONACA: In the past we left it to  
9 a licensee to have a choice. For example, in Browns  
10 Ferry, the staff was asking for inspection of the  
11 seals. They fought that. We left them open, either  
12 that or UT the liner in the vulnerable locations. And  
13 they chose to UT the liners.

14 The burden is inaccessibility because  
15 there is going to be that every ten years. And when  
16 they do the ISR, they are in containment. And they  
17 physically can then perform most of the utilities in  
18 those locations. So we left open those possibilities.

19 I take your point, and I think the  
20 Committee should decide. Should we have a comment on  
21 this or -- the intent wasn't one of providing a  
22 letter. This was an informational presentation, but  
23 --

24 CHAIRMAN WALLIS: I think the staff has  
25 heard our comments. It was a preliminary sort of

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1 thing. And that is probably good enough for now.

2 MR. GILLESPIE: We appreciate the comments  
3 because, as Mario said, underground cabling, piping,  
4 and this kind of large passive component are really  
5 becoming kind of the end point. Everything else we  
6 know how to deal with for the most part.

7 But I will say in this case -- and let me  
8 take Browns Ferry. You might say, well, why did  
9 Browns Ferry choose UT versus the seals. Browns Ferry  
10 actually had unidentified sources of leakage. And he  
11 said versus trying to identify every source of leakage  
12 because they didn't know where it was that their  
13 cheapest way out was actually to do the UT.

14 But they got the idea that we wanted to  
15 wait. And you had to assure us this thing was going  
16 to be okay relative to thickness.

17 VICE CHAIRMAN SHACK: That sand pocket is  
18 pretty big. I mean, you can have a fair amount of  
19 moisture in there that you're never going to see  
20 coming out of those drains. And, yet, you could have  
21 attack over a reasonable fraction of that.

22 MEMBER SIEBER: There are oodles of  
23 surface in there for the moisture to collect on.

24 MR. GILLESPIE: But, again, the locations  
25 of the drains are plant-specific. Some plants have

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1 seals, as Monticello had over it. Some places have a  
2 liner or coding on the other side of the surface.

3 VICE CHAIRMAN SHACK: Well, a bottom drain  
4 would give me a whole lot more comfort than that top  
5 drain would.

6 MR. GILLESPIE: Yes. The other thing is  
7 the sand is very compacted.

8 MEMBER KRESS: Have you ever tried to  
9 drain moisture out of the sand from the bottom? It  
10 doesn't come out.

11 MR. GILLESPIE: I don't want to pooh-pooh  
12 it, but the idea that this is a 130-degree area also  
13 --

14 VICE CHAIRMAN SHACK: You drive it out  
15 with --

16 MR. GILLESPIE: And so you're going to  
17 drive it out. And so you've actually got the occasion  
18 to get water in there about 20 days every 18 months or  
19 24 months depending on the fuel cycle someone is on  
20 and how long it's flooded. And that's why we've  
21 started to key into visual. You might say, visual  
22 leakage from someplace kicks you into needing to do a  
23 UT.

24 Now, what this inter-staff guidance  
25 position does do is says the identification of

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1 moisture, basically leakage, is equivalent to the  
2 visual recognition of accelerated corrosion on the  
3 inside. And that's an important distinction, which  
4 never existed before.

5 So for the inaccessible areas, we're using  
6 the indirect indication of seeing water as kind of an  
7 assumption that you have to do the same thing as if  
8 you saw accelerated corrosion on the inside. That  
9 gets us a measurement on an event basis.

10 And so someone who is sworn to keeping  
11 this thing dry, if they have an event during a  
12 refueling where they get leakage in there, now they're  
13 obligated to do something which is a bit more onerous  
14 and reestablish their rate.

15 It's not perfect. By the way, there are  
16 two inaccessible areas. We should be clear on that.  
17 There is the inaccessible area in the air gap. And  
18 then there's this inaccessible area that's layered on  
19 the bottom between the two concrete layers, which is  
20 really probably the most difficult area, but it was  
21 designed to last 40 years. It is totally lined with  
22 concrete. And then you've got this temperature  
23 gradient.

24 CHAIRMAN WALLIS: Is 40 years good enough  
25 with license renewal, though?

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1 MR. GILLESPIE: Now, it was originally  
2 designed for 40 years, but that was kind of an  
3 assignment. But now if you have no evidence of in  
4 leakage or water in there, I mean, again, it's  
5 indirect stuff. It's almost like a circumstantial  
6 case we're acting --

7 CHAIRMAN WALLIS: Concrete is not dry all  
8 the time.

9 MR. GILLESPIE: Concrete is porous  
10 material, and it is not dry all the time. And so then  
11 you could ask questions. A fair question in the aging  
12 management program is, what are you doing about  
13 groundwater? And do we have any evidence of  
14 groundwater?

15 We asked that from Nine Mile. And I think  
16 we're coming. I signed up the draft SE this morning.  
17 So I think next month we're probably coming on Nine  
18 Mile. They have actually got alarms on their drains  
19 if moisture is detected.

20 So every plant is doing some unique  
21 things.

22 CHAIRMAN WALLIS: Moisture can come out of  
23 the concrete. There is a lot of concrete. There is  
24 a late curing of the concrete which goes on for a long  
25 time. Then it can be damp. It doesn't have to be

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1 very damp --

2 MR. GILLESPIE: Right.

3 CHAIRMAN WALLIS: -- to produce some  
4 chemical reaction.

5 MR. GILLESPIE: What is the impact? This  
6 is what I don't know, is what is the impact of this  
7 temperature gradient.

8 CHAIRMAN WALLIS: You don't have oxygen.  
9 So that is probably what protects you.

10 MR. GILLESPIE: And so there is a number  
11 of things that -- we're doing our best, appreciate the  
12 Committee's comments, and more than happy. If anyone  
13 else has any better ideas, we would love to have them,  
14 but this ISG was an effort to send a benchmark for  
15 basically the best-performing plant on liners.

16 It has no moisture. What if you get  
17 moisture? How do you establish your rate? This is  
18 kind of putting out, in essence, that they now know we  
19 do expect a rate to even be established. We didn't  
20 have that in writing before.

21 CHAIRMAN WALLIS: We won't comment on it,  
22 and we hope it works out.

23 MR. GILLESPIE: Well, feel free to comment  
24 on it. We're happy to have comments. NEI is going to  
25 feel free to comment on it.

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1 CHAIRMAN WALLIS: We won't.

2 MEMBER BONACA: Certainly we will comment  
3 on individual applications.

4 MR. GILLESPIE: Yes. I do think this is  
5 middle ground we are wrestling with here because I do  
6 agree with Alex that the individual designs that we're  
7 applying this concept to are significantly different.  
8 In critical questions, like locations of drains, some  
9 are going to be more susceptible than others.

10 As I said, Browns Ferry said we have  
11 unidentified leakage. We know we have leakage. It's  
12 not a lot. UT is our answer. It's the only way that  
13 could give us positive confirmation.

14 CHAIRMAN WALLIS: Have they been having  
15 leakage on their reactor which has been shut down for  
16 all that period of time, unidentified leakage?

17 MR. GILLESPIE: Well, remember, we license  
18 units I, II, and III. The floor wasn't flooded on 1.  
19 So they haven't had any leakage on I for a long time.

20 CHAIRMAN WALLIS: They think they haven't.  
21 They could have an unidentified leakage.

22 MR. GILLESPIE: They had some unidentified  
23 leakage from refuelings in the other units, and they  
24 chose UT.

25 MEMBER SIEBER: They have them for fuel

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1 for --

2 MR. GILLESPIE: By the way, this is a very  
3 high-dose area, too. And so the question here isn't  
4 money.

5 MEMBER BONACA: Not only they. I mean --

6 MR. GILLESPIE: It's going to be dose.

7 MEMBER BONACA: Where the seals are, it's  
8 a very high red area.

9 MR. GILLESPIE: Yes.

10 MEMBER BONACA: Not down in the sand  
11 pocket.

12 MR. GILLESPIE: It depends on where you're  
13 at. You're directly under the vessel.

14 CHAIRMAN WALLIS: No one is going to go  
15 down there.

16 MR. GILLESPIE: My understanding from the  
17 licensees is from a radiological perspective, this is  
18 not an area you want to take lightly doing extra  
19 measurements over and above what you really need to  
20 confirm your --

21 CHAIRMAN WALLIS: BSBWR has hatches that  
22 you go in into the reactor pedestal area.

23 MEMBER BONACA: We were told by TVA that  
24 it is not a high red area because it is well below the  
25 --

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1                   MEMBER KRESS:  Graham, I was wondering if  
2                   the staff is considering a user need letter to  
3                   Research to try to develop a way to do this more  
4                   definitively, maybe strong on ultrasonics or  
5                   something.  Is there such a user need letter or any --

6                   VICE CHAIRMAN SHACK:  Well, there is  
7                   something from Oak Ridge now.

8                   MR. GILLESPIE:  Actually, there is a  
9                   letter report that just recently got put in ADAM from  
10                  Oak Ridge, from a project that Research sponsored, but  
11                  it is not commercially available yet.  And, as best I  
12                  understand it, it is a technique to calibrate for this  
13                  concrete steel concrete sandwich.

14                  I think, as I understand it, there are  
15                  three different alternative approaches to doing it.  
16                  And so the information is starting to be developed and  
17                  published.  But we're probably years away from actual  
18                  commercial application to go from the research bench  
19                  to the --

20                  MEMBER KRESS:  Yes, but you have got years  
21                  to go to do it in.  I mean, the corrosion rate is low  
22                  enough that --

23                  MR. GILLESPIE:  I am not disagreeing.  If  
24                  the Committee would like to -- we think we're actually  
25                  pretty close right now on a plant-by-plant basis.  But

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1 if the Committee would like to write a letter  
2 recommending a research project, it's okay. I don't  
3 mind. It's your Committee.

4 MEMBER SIEBER: The question is what do  
5 you want to cut out to pay for it.

6 MEMBER MAYNARD: I would like to just add  
7 on to Tom's previous comment just a little bit. It  
8 doesn't surprise me. And I would expect the industry  
9 to resist new requirements, new changes to things. I  
10 think it better to get the fight over, have it once,  
11 rather than a lot of times.

12 So, rather than dealing with a lot of  
13 things through staff guidance, generic letters, a lot  
14 of times it would be better if this is going to be a  
15 new expectation, new requirement, let's follow the  
16 process and make that -- you know, get the fight over  
17 with once, make it happen, rather than continually  
18 trying to go around these systems just generically.

19 MEMBER SIEBER: The requirement has always  
20 been there. And it stems from the code requirement.  
21 The question is, what do you do and how do you do it  
22 to give yourself a reasonable assurance that you're  
23 okay.

24 MR. GILLESPIE: The new aspect now is  
25 people having to articulate in an aging management

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1 program what they're going to do to ensure that their  
2 monitoring and measurement process for this liner will  
3 detect its approach to minimum wall thickness prior to  
4 it getting there.

5 I mean, that's really what plant license  
6 renewal is, to ensure that you have the additional  
7 monitoring programs in place that you will detect and  
8 correct prior to exceeding that minimum wall  
9 thickness.

10 The discussion of this ISG between us and  
11 the industry is evoked. I think it has now gotten us  
12 to a point where we have some actual cases under our  
13 belt that have now, you might say, set the standard  
14 for the next ones to come in.

15 And now we've got each plant evaluating  
16 itself against the plants we have already looked at  
17 and saying, "Am I like them? Am I different? If I'm  
18 different, then is it a positive difference or  
19 negative difference?"

20 And now we're starting to get those kind  
21 of aging management considerations into this piece of  
22 equipment, which we did not have, quite honestly,  
23 going in until we hit Browns Ferry.

24 The Committee wants -- Mario will remember  
25 this. I forget which BWR they were in. It was on the

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1 steam dryers. And I used the Committee. I quoted the  
2 Committee to the staff on the liner. And it was on  
3 the dryers.

4 And, Mario, I forget. You might have been  
5 the one who said it. You said it's large, it's  
6 passive, and you just wrote a generic letter saying  
7 it's safety. It wasn't in scope before that statement  
8 was made. It's now in scope. And, you know, the  
9 staff said it's large, it's passive, it has corrosion,  
10 and it's safety. And so now we're trying to take it  
11 on head on. I think with some success, you're seeing  
12 the applications getting it addressed at some level of  
13 credibility now.

14 MR. THADANI: Graham, I have one quick  
15 question.

16 Frank, you noted this is a high-dose area.  
17 This issue is one important in many ways, has I think  
18 rather minimal risk to public. How is that sort of  
19 balanced in terms of the actions called for and its  
20 relative importance?

21 MR. GILLESPIE: I think how we are trying  
22 to deal with that -- and we have got a meeting with  
23 one applicant day after tomorrow, Oyster Creek, on  
24 this, on our residual concerns after their RAIs. And,  
25 really, what we started talking about was the

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1       uncertainties involved in the decision.

2                   And so the question really is, how much  
3       should you pay for certainty in a decision? Because  
4       the significant measurement uncertainty and doing  
5       these UT exams, they're actually fairly coarse.

6                   There is uncertainty in primers and  
7       liners, which have exceeded, basically, the  
8       manufacturer-recommended lives of 10 to 15 years.  
9       Yet, they're still there. And they're still being  
10      inspected doing what they're doing.

11                  There is uncertainty in have you picked  
12      enough selected locations because we are looking for  
13      a general area degradation. We're not looking for  
14      just pitting.

15                  The Committee didn't mention it, but there  
16      are really two concerns. One is pressure retention  
17      and accident. And the other is buckling, the sheer  
18      collapsing of this thing under its own weight. And so  
19      you've got two reasons to inspect two different areas.

20                  And so I would suggest that in this ISG  
21      and what we're seeing from these utilities, we're  
22      actually accepting, you might say, a fair level of  
23      uncertainty in it to keep it rational.

24                  And so the safety consideration is in how  
25      much do we want to press people to make it more and

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1 more certain. And so that's really how we're  
2 factoring in the safety significance of it.

3 When I talk about dose and how many  
4 measurements need to be taken, we need reasonable  
5 assurance. And in many cases, there's not positive  
6 evidence on either side because this is a large  
7 passive thing that was put in there. It's expected to  
8 last forever fundamentally from the designer's point  
9 of view. We're confirming that assertion.

10 CHAIRMAN WALLIS: It probably will in most  
11 plants last.

12 MR. GILLESPIE: In most plants, I think it  
13 will. And so it's a confirmation. And so we're not  
14 designing the plant, which is very vigorous. We're  
15 confirming that the expected performance will be  
16 sustained. And we probably can be slightly less  
17 rigorous in the uncertainty we accept on that.

18 CHAIRMAN WALLIS: That is all the agency  
19 ever does. It doesn't design plants.

20 MR. GILLESPIE: Right.

21 CHAIRMAN WALLIS: It confirms performance.

22 MR. GILLESPIE: But you learn how much,  
23 what you're going to do in that confirmation.

24 MEMBER BONACA: Yes.

25 CHAIRMAN WALLIS: I think we may have gone

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1 over. We have gone over 15 minutes. I think it's  
2 about time we --

3 MEMBER BONACA: One last comment I had was  
4 that, you know, so many of the -- however the  
5 inspection processes we still depend on, for example,  
6 the visual inspection of this, we are still at the  
7 pace that really was conceived at the moment these  
8 plants are put in renewal. Okay? So every ten years  
9 they go in and look at it. Okay?

10 To me, you know, as these plants get older  
11 and older, these inaccessible areas, et cetera, you  
12 know, then maybe the frequency with which we're  
13 looking at it becomes more questionable because, you  
14 know, every ten years, a lot of things can happen.

15 CHAIRMAN WALLIS: Especially when you  
16 start to find things.

17 MR. GILLESPIE: We have occasions in  
18 several licensees where because they were sticking to  
19 a more extended inspection period, even when they had  
20 evidence of water, they did not consider evidence of  
21 water equivalent to accelerated corrosion visually.

22 So this ISG actually tries to take the  
23 principle you just espoused and says, "You can no  
24 longer in our expectation, staff's expectation, you  
25 can no longer ignore the presence of water. You have

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1 to now give us positive confirmation that the rate of  
2 degradation is still being minimized.

3 CHAIRMAN WALLIS: It is not boric acid.

4 MR. GILLESPIE: Yes, yes. At least we're  
5 dealing with a general moisture.

6 CHAIRMAN WALLIS: Right.

7 MR. GILLESPIE: And so this actually does  
8 go for that extended period to some incidents in which  
9 we actually have evidence from various licensees.  
10 They had evidence of water and basically did an  
11 engineering evaluation and did not obtain positive  
12 information if the thickness was okay.

13 MEMBER BONACA: What are you going to do  
14 when one of the already approved license renewals is  
15 going to come in for another license renewal?

16 MR. GILLESPIE: They have talked to us  
17 about that.

18 MEMBER BONACA: Well.

19 MR. GILLESPIE: I'm hoping to be retired  
20 by that point.

21 MEMBER BONACA: Anyway, I think we will  
22 see how this works.

23 MR. GILLESPIE: I started with the draft  
24 of the renewal rule in 1989 and have been doing this  
25 now for the last five years. At some point, someone

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1 else should do it.

2 MEMBER BONACA: All right.

3 MR. GILLESPIE: Thank you.

4 MEMBER BONACA: I give you back the  
5 meeting, Mr. Chairman.

6 CHAIRMAN WALLIS: We are ready to come off  
7 the record. Thank you very much for recording the  
8 meeting today, and we will take a break until a  
9 quarter to 5:00.

10 And when we come back, we will finish  
11 Mario's letter, which seems to be fairly  
12 straightforward. And then we will know where we are  
13 going with the other letter, hopefully know well  
14 enough that we can see our way to the end of it  
15 tomorrow.

16 (Whereupon, the foregoing matter was  
17 concluded at 4:34 p.m.)

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