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UNITED STATES NUCLEAR REGULATORY COMMISSION'S
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

December 8, 2005

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This transcript has not been reviewed, corrected and edited and it may contain inaccuracies.

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

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528TH MEETING

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THURSDAY,

DECEMBER 8, 2005

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The Committee met in Room T-2B3 of the U.S. Nuclear Regulatory Commission, Two White Flint North, 11545 Rockville Pike, Rockville, Maryland, at 8:30 a.m., Graham B. Wallis, Chairman, presiding.

PRESENT:

- GRAHAM B. WALLIS, ACRS Chairman
- WILLIAM J. SHACK, ACRS Vice Chairman
- JOHN E. SIEBER, ACRS Member-at-Large
- GEORGE E. APOSTOLAKIS, ACRS Member
- MARIO V. BONACA, ACRS Member
- RICHARD S. DENNING, ACRS Member
- THOMAS S. KRESS, ACRS Member
- DANA A. POWERS, ACRS Member
- VICTOR H. RANSOM, ACRS Member

I-N-D-E-X

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

8:32 a.m.

1
2
3 CHAIRMAN WALLIS: Good morning. The
4 meeting will now come to order. This is the second
5 day of the 528th meeting of Advisory Committee on
6 Reactor Safeguards. During today's meeting, the
7 Committee will consider the following: Early Site
8 Permit Application for the Grand Gulf Nuclear Station
9 and the Associated Final Safety Evaluation Report;
10 Draft Final Generic Letter, "Impact of Potentially
11 Degraded Hemyc/MT Fire Barrier Materials on Compliance
12 with Fire Protection Regulation;" Proposed Program
13 Plan and Advanced Notice of Proposed Rulemaking for
14 Risk-Informing 10 CFR Part 50; and the Preparation of
15 ACRS Reports. In addition, we will meet with the NRC
16 Commissioners between 1:00 p.m. and 3:00 p.m. in the
17 Commissioners' Conference Room, One White Flint North,
18 to discuss items of mutual interest.

19 This meeting is being conducted in
20 accordance with the provisions of the Federal Advisory
21 Committee Act. Mr. Sam Duraiswamy is the Designated
22 Federal Official for the initial portion of the
23 meeting. We have received no written comments nor
24 requests for time to make oral statements from members
25 of the public regarding today's sessions. A

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1 transcript of a portion of the meeting is being kept
2 and it is requested that the speakers use one of the
3 microphones, identify themselves and speak with
4 sufficient clarity and volume so that they can be
5 readily heard.

6 I would now like to proceed with our
7 business and the first item on our agenda is being
8 introduced first by my colleague, Dana Powers. Dana,
9 please continue.

10 MEMBER POWERS: Okay. We're going to
11 discuss the Early Site Permit of Grand Gulf. This is
12 that we're trying to finalize this review of the early
13 site permit and the Staff's SER on this early site
14 permit. We have written an interim letter.

15 You will recall in that interim letter we
16 discussed a variety of items but three we raised
17 questions about. We raised questions about a more
18 explicit discussion of hazardous material transport on
19 the Mississippi River and any threat that might pose
20 to the proposed new site.

21 We discussed the issue of the
22 applicability of past weather data to prognosticate
23 the future. Since that time, we have had some weather
24 events in the general Mississippi area that would be
25 of interest to know how they impacted things.

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1 Also since that time, we have been able to
2 do some of our own research on whether cycles in the
3 Gulf of Mexico and what I can report to you is indeed
4 there are cycles; that we do see cycles in hurricane
5 frequency in the area. The issue then becomes whether
6 you get cycles of very intense hurricanes or not in
7 the area. If hurricane activity goes up, you also get
8 increased frequency of very intense hurricanes and
9 what I can tell you is the historical record does not
10 provide enough information to resolve that issue.
11 There are two theories on the subject. So on average,
12 it's about as postulated in the early site permit.

13 The third area that we had questions about
14 was the treatment of maximum winter precipitation and
15 its relationship to the maximum snow load and whether
16 that was a rational burden to transfer to the COL as
17 a site characteristic or not.

18 Those are the questions that we had posed
19 in the past and we'll turn to the speakers now to
20 remind us of the nature of the proposed Grand Gulf
21 site and the resolution of the issues that were
22 outstanding at the time of our interim meeting. I
23 think we're going to be led off with a presentation by
24 George Zinke.

25 MR. ZINKE: Yes.

1 MEMBER POWERS: It's all yours, George.

2 MR. ZINKE: I'm going to let Kenneth
3 Hughey start with some introductions.

4 MR. HUGHEY: Good morning. My name is
5 Kenneth Hughey. I'm the Senior Manager for Business
6 Development in Entergy Nuclear. Randy Hutchinson, our
7 Vice President, was hoping to be here today to kick
8 this off but other things came up and he wasn't able
9 to attend.

10 So before I get started, I would like to
11 just introduce the team members that we brought today.
12 George Zinke is our Licensing Manager for early site
13 permit. He primarily will lead the discussion today.
14 To his right is Guy Cesare with Enercon Services, one
15 of the principal investigators for the early site
16 permit. Al Schneider with Enercon Services in the
17 back. We have Bill Lettis with William Lettis and
18 Associates is our seismic expert in this area. Garry
19 Young, a recent addition to our team members. The
20 reason for Garry Young is he will be following up as
21 our project manager for our COL project that we've
22 announced at our Riverbend site. Kathryn Sutton with
23 Morgan Lewis who also has assisted us in early site
24 permit. Then in the back, Mike Bourgeois who is also
25 a member from Entergy on our early site permit.

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1 Let me say that we're happy to be here
2 today. We think this is a very important milestone in
3 early site permit. We very much look forward to the
4 discussions today, hopefully addressing your
5 questions. We would like to compliment the Staff on
6 their work today to get us to this point and we very
7 much look forward to working ourselves through this
8 process efficiently and effectively and hopefully very
9 soon having an early site permit that Entergy looks
10 forward to using at Grand Gulf with our plans for COL
11 coming in the future. With that unless there are any
12 questions for me, I'll turn it over to George and
13 we'll get right into it.

14 MR. ZINKE: Okay. The presentation today,
15 we'll just real briefly go over some general
16 information that you've seen before and at the last
17 time we were SER was in draft and there were some open
18 items and since we last met there have been changes to
19 that status. So we'll briefly go over that and then
20 we'll move into the three subject areas that you just
21 talked about.

22 The next slides are just as a background
23 where the Grand Gulf site as you know is in
24 Mississippi and some of the characteristics are listed
25 on slide four. I didn't plan on discussing this since

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1 this is again a repeat but just to bring it together.
2 The map on page five again shows the location of Grand
3 Gulf site on the Mississippi River in Mississippi.

4 Slide six is the early site permit
5 application, some of the details. We do have a single
6 unit on the site currently and that the permit was to
7 evaluate the characteristics of the site for
8 additional units. The current operator of the current
9 unit is Entergy Operations. Entergy is a company that
10 has multiple subsidiaries and that's why we have a
11 number of the subsidiaries.

12 MEMBER POWERS: We've noticed.

13 MR. ZINKE: Right. So unless there are
14 any questions on the background, let's move into slide
15 seven. The DSER as issued in April of 2005. In that
16 there were some open items. Our primary response was
17 in June and then we provided some supplemental
18 information later in June through September. The
19 final SER was issued in October.

20 On slide eight, depending upon how you
21 want to count the action items, you have a handout
22 that looks like this that outlines the individual
23 items and depending on how you want to count them. We
24 count them with items and sub-items to be 31. You get
25 different counts because on some of the items there

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1 were ABCs. So we just counted them. In general, most
2 of the items we provided some additional information
3 to the Staff and they were either closed or some of
4 the issues were left to become either permit
5 conditions or action items.

6 Raj in the NRC presentation will go over
7 with you the difference in the criteria for what's the
8 difference between permit conditions and action items.
9 In basic, the action items capture things about the
10 site that we and the Staff agree are issues are better
11 resolved in the context of a COL application where you
12 marry the site with the design rather than resolving
13 it with just the information solely about the site in
14 looking at a plant envelope without more specifics of
15 the design that would be put on that site.

16 In the area, the items that were
17 associated with emergency preparedness or a
18 characterization of the open items was a little bit
19 different. Going into the process, we had
20 expectations and ideas on what major features were and
21 what they would accomplish in the early review in the
22 new Part 52 licensing process and we had lots of
23 lessons learned in that process. But basically at the
24 end with the open items, we determined that the open
25 issues were going to have to be addressed again with

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1 the COL application due to their nature and that it
2 was more beneficial to us to not continue to provide
3 more information and resolve the details of emergency
4 planning in the context of a COL application rather
5 than in this thing called "Major Features for the
6 Early Site Permit."

7 Ultimately, the Staff looked at the
8 information that we had and within their process, they
9 granted most of the major features that we had
10 requested and that one of the major features given the
11 level of information that we had provided, they did
12 not grant one of the major features. But either way,
13 the way we viewed it is that the full and integrated
14 emergence plan that gets provided that we would
15 provide in the COL application is the mechanism for
16 really resolving those.

17 MEMBER POWERS: I think the way you've
18 properly characterized it is that this term "Major
19 Features" is a major lesson learned that we need to
20 refine that a little bit and say exactly what we mean
21 there just to facilitate the process for future
22 people. Sorry you suffered but it's a good lesson
23 learned and we'll look for your insights on how to
24 make that better in the future. But I think you put
25 your finger on the pulse there.

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1 MR. ZINKE: Okay.

2 MEMBER POWERS: It just needs some
3 specificity and I think everybody agrees to that.

4 MR. ZINKE: And it was very valuable for
5 us to go through because we learned a lot that will be
6 very beneficial as we prepare the COL application.

7 MEMBER POWERS: Good.

8 MR. ZINKE: At this point, I just want to
9 ask if you have any questions on specific open items
10 other than there's a few that cross over into the
11 areas of your questions on the flooding and the
12 hazards that we'll get to in a little bit. But other
13 than those, I didn't know you had any specific
14 questions on anything.

15 MEMBER POWERS: No, I don't have any
16 specific ones on the items other than the three areas
17 that I mentioned.

18 MR. ZINKE: Okay.

19 MEMBER POWERS: I don't know if any other
20 members have questions in other areas. Why don't you
21 just go ahead, George? I have never seen the
22 Committee shy about asking questions out of context.

23 MR. ZINKE: That would be fine. We can
24 come back if you think of things.

25 MEMBER POWERS: Good.

1 MR. ZINKE: The next area we want to spend
2 some time on was that as you noted in our last ACRS
3 there was a lot of discussion about weather and global
4 warming and the predictability of weather patterns and
5 since we last met and obviously since we submitted the
6 early site permit application, there's been weather
7 experience in the States of Mississippi and Louisiana.

8 MEMBER POWERS: Gosh, has there.

9 MR. ZINKE: And so we wanted to talk a
10 little bit about the process first before we actually
11 talk with you about what that experience has shown us.
12 The early site permit application was submitted in
13 October of 2003. Since that time, we've had
14 discussions with the staff about the finality of
15 various information that gets put into a permit and in
16 the context of what happens with an early site permit
17 once you use it in the context of COL application.

18 One of the letters the Staff put out dealt
19 only with environmental finality and provided the
20 industry some guidance on dealing with new significant
21 information and the kind of processes an applicant
22 would have in evaluating to see if changes affect what
23 was previously said. In the safety area, although
24 this letter does not cover the safety, some of the
25 concepts are similar in the sense that if new

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1 information happens the applicant has to deal with it
2 and make some judgments and needs to have some
3 processes that would reasonably determine if there's
4 new information and the significance.

5 However, in the safety area, there
6 certainly are different thresholds. With the early
7 site permit, it establishes some site characteristics.
8 So if we ever became aware through new information
9 that those site characteristics were no longer valid,
10 then we would have to deal with that. Likewise, when
11 we use the early site permit in the context of a COL
12 application, we would be making judgments on all of
13 those sites characteristics and any new information
14 that we're aware of at that time that has happened
15 since we submitted and then putting them in the
16 context of a selected design and looking at margins.
17 Some of the requirements for that really come out of
18 52.79 and some of it is just logical that you have to
19 do that in order to prepare an application.

20 So since that time, we've had the
21 hurricane experience. What I'm going to be presenting
22 to you has not been submitted to the staff and does
23 not form part of the basis for the early site permit.
24 And I make that emphasis because some of the ways
25 we've looked at the data at this point would be

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1 different than the analysis that we would do in the
2 context of a licensing application. For example, I'm
3 going to show you some data, then some comparisons,
4 that we looked at versus in an application we're going
5 to follow the methods and the standards that are
6 provided for how you determine site characteristics.

7 On slide ten, we've looked at relative to
8 weather experience what are the kinds of
9 characteristics and parameters that become important
10 with regard to hurricanes and it's things like the
11 maximum wind gusts in miles per hour, the maximum
12 precipitation rates and PMP site flooding which end up
13 being site characteristics in the context of the early
14 site permit. But it also then becomes important as to
15 what is the structural design of the facility you
16 would be selecting and the parameters so you can
17 determine what your margins are in order to figure out
18 whether this new information is significant or not.

19 CHAIRMAN WALLIS: What does very heavy
20 rain do to the slope down to the river? Does it
21 produce an erosion or land movement?

22 MR. ZINKE: As we talked a few months ago
23 for Grand Gulf because we're on flat ground, a lot of
24 rain can flood the immediate area around the plant
25 pretty quickly and that's why the current Grand Gulf

1 has a flood plan, ditches, drainage paths. So the
2 amount of rainfall and the prediction of that and the
3 margins we'd have becomes important.

4 CHAIRMAN WALLIS: But if it did overload
5 your drains and flood over the bank, then presumably
6 you might produce a new canyon or something down
7 below.

8 MR. ZINKE: Yes. That's why for the
9 existing Grand Gulf we have things like flood
10 protection on the doors. So it's something your
11 design just has to consider.

12 On slide 11, in our general ESP
13 methodology, we collected the regional data based upon
14 the industry standards. What that means is that the
15 site characteristics are not directly where you just
16 take direct readings from what was at the site. Here
17 in fact are industry standards that gather information
18 in the region over time and go through statistical
19 analysis and out of that pops out numbers that then
20 become part of your basis.

21 Some of those standards have changed since
22 we submitted the application and we expect they will
23 continue to change as data is gathered. That's why we
24 would again use the early site permit and the COL. We
25 need to relook at those and see from a standards have

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1 things changed that would change what the site
2 characteristic is and likewise the calculation methods
3 are established in standards.

4 For the early site permit that we
5 submitted, what we submitted was the max three second
6 wind gust for Grand Gulf was established at 96 miles
7 per hour and max one hour precipitation 19.2 inches.
8 Those become important as we go through our experience
9 so you have at least some idea of what kind of numbers
10 did we see relative to what our site characteristic
11 is. And then how do those numbers compare to the kind
12 of thing that you see in design and structure
13 analysis, the number that the designs are actually
14 designed to.

15 On slide 12, one of the things we looked
16 at for this presentation which is beyond what the
17 standards would have us do is trying to judge the
18 hurricanes did not come through Grand Gulf. They came
19 through other parts of Mississippi and Louisiana. So
20 we looked at what kinds of things can we learn from
21 that given it really didn't come over Grand Gulf. So
22 we looked at least for the wind and looked along the
23 same latitude and tried to gather data that is
24 available to give us some idea of that hurricane.

25 MEMBER POWERS: This is good because in

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1 your application, you did a similar thing for Camille
2 but it hinges very much on Camille. So to the extent
3 that you can add to that database, I think you enforce
4 that. That was one of the things that was really
5 bothersome about the application is that it hinged
6 very much on what Camille did. Now you have some
7 extra data.

8 MR. ZINKE: Right.

9 MEMBER APOSTOLAKIS: Let me just ask
10 something of you. Is there any physical reason why
11 these hurricanes missed the site or is it a pure real
12 random event? In other words, the next one might
13 actually hit the site.

14 MR. ZINKE: The steering forces on the
15 hurricane are independent. Generally, it's
16 meteorological conditions in the Gulf of Mexico. If
17 you look at the historical record and plot all of
18 them, they're all over the street.

19 MEMBER APOSTOLAKIS: So what you're saying
20 is that it's really a random event. It could hit the
21 site.

22 MR. ZINKE: Yes.

23 MR. CESARE: Totally. Just like it could
24 hit anything on the coast and then inland from that
25 point on.

1 MEMBER APOSTOLAKIS: Okay. So if it hits
2 the site and you have as you say there 160 miles per
3 hour, what happens?

4 MR. CESARE: The wind gust was at
5 landfall. So that's -

6 MEMBER POWERS: This is the contention
7 that's made in the application is that if the
8 hurricanes slowed down as they go over the land and
9 the question they're asking is suppose that this
10 hurricane did come right over the site. What kind of
11 attenuation do I get having traveled that distance
12 over land?

13 MR. ZINKE: Exactly.

14 MEMBER POWERS: And in the application
15 itself, they drew that information out of Camille and
16 now we're going to look and say what additional
17 information do we get out of Rita and Katrina. For
18 that question in the past, you didn't have a lot of
19 data points. Now you suddenly have two more data
20 points and they seem to be supporting the general
21 contention that you had in Camille which adds potency
22 to the argument here it seems to me.

23 MR. CESARE: If I might add, Dr. Powers,
24 to what you're saying, Hurricane Camille was described
25 in the application prior to these events and it was

1 described in the body of historical weather
2 information. However, the site characteristics are
3 developed on industry standards.

4 MEMBER POWERS: Yes, I understand.

5 MR. CESARE: And ASCE studies and then
6 incorporates that with all other weather information
7 for max wind gusts and then comes up with a family of
8 curves.

9 MEMBER POWERS: Yes. You did a
10 responsible job in putting together the information
11 and because if you'd not written about Camille, I
12 would have said what about Camille.

13 MR. CESARE: Right.

14 MR. ZINKE: And course, Camille even forms
15 part of the license basis for the current unit. But
16 with regard to your question about the randomness,
17 there are some aspects of the hurricane that would be
18 random. There are still physical features but as far
19 as where they will hit landfall. But once they hit
20 landfall, then there are some physical things that are
21 predictable about no longer is there a water source
22 for them to pick up water. Now you can predict they
23 are going to become less in strength.

24 MR. CESARE: And energy from the water.

25 MR. ZINKE: And energy. And then again,

1 there is some randomness in the difference in the
2 hurricanes. Camille was an extremely strong hurricane
3 but compact. So when you look at the damage and how
4 it actuated, that's different than the Katrina which
5 was less strong but bigger, broader. And then you
6 look at the hurricanes, there are certain aspects of
7 the hurricane like the strength of the wind that's
8 close to the eye.

9 But then there's the aspect of the
10 hurricane that deals with the water which is now going
11 to be more on the edges and associated with where it's
12 picking up the water. So that's why at least for this
13 presentation we looked at different aspects of that
14 just to draw some comparisons. If we look at wind
15 speed and the water, we figured some of that, we
16 wanted to at least look at what happens along the same
17 latitude relative to the strength, the decrease of the
18 hurricane. There are at least some conclusions that
19 you might draw.

20 CHAIRMAN WALLIS: This is very good but
21 then you have three data points and there has to be
22 some logic which says now we're going to assess what's
23 the probability of the wind being more than so much.
24 I'm not quite sure how you do that.

25 MEMBER POWERS: That's where they go to

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1 the end of these three standards. I mean that's hard.

2 CHAIRMAN WALLIS: That's right. Industry
3 standard helps you with that. That's right.

4 MEMBER POWERS: The heart of their
5 application is really the industry standards on this.
6 This is more anecdotal information that substantiates
7 the contention and the problem in the past was that
8 they had one data point and now we have more.

9 CHAIRMAN WALLIS: As long as it
10 substantiates it, it's good.

11 MEMBER POWERS: Right.

12 MR. ZINKE: And that's why I made the
13 point at the beginning. Relative to a licensing
14 application, I'm going to stick with the standards.
15 But for what I'm presenting here isn't from that
16 source. It's more of this is kind of the information.
17 That's why when we get to COL application and we
18 actually have our documented counts and things, it
19 will be based in a different way than what we're
20 presenting here.

21 MEMBER POWERS: This is information that's
22 going to be absolutely crucial for your public meeting
23 on this.

24 MR. ZINKE: Yes.

25 MEMBER POWERS: You know you're going to

1 have public interest in this particular question.
2 Many are interested. Please continue.

3 MR. ZINKE: Okay.

4 MEMBER BONACA: Just a question of
5 clarity. The previous slide that you didn't show but
6 seems to show a lesser attenuation for Katrina than
7 for Camille. Is there a relationship between the
8 width of the hurricanes? You were saying that Camille
9 was a narrower with a strong punch. Is there a
10 relationship between attenuation and the radius of the
11 storm?

12 MR. ZINKE: There ends up to be a lot of
13 things that can affect how the strength decreases. So
14 it's not any one or two or three things.

15 MEMBER BONACA: You don't have the
16 specifics.

17 MR. ZINKE: Right. And at least, I'm not
18 aware of any modeling that you can factor in all of
19 those things.

20 MEMBER BONACA: Okay. I was just curious.

21 MR. ZINKE: So in comparing the three
22 hurricanes, Katrina was in August of 2005. At
23 landfall, the gusts were 160 compared to Rita at
24 landfall 150. Camille in '69 was 170 which just says
25 that the wind at landfall were similar but Camille was

1 stronger. Katrina passed about 90 miles, this is the
2 eye, east of the site and at the same latitude where
3 Grand Gulf or close to that same latitude, the gusts
4 were around less than 92 miles per hour. For that
5 hurricane, the max Grand Gulf wind was 21 miles per
6 hour. You can see that's because the hurricane was
7 east of Grand Gulf.

8 MR. CESARE: That is not an instantaneous
9 gust though.

10 MR. ZINKE: That's right.

11 MR. CESARE: Our data, that's the peak
12 hourly average at 4:00 p.m. that afternoon.

13 MR. ZINKE: So some of that's a little bit
14 apples to oranges.

15 CHAIRMAN WALLIS: The instantaneous gusts
16 are a little bit bigger.

17 MR. CESARE: Just to give you a framework.

18 MR. ZINKE: For Rita, the wind gust
19 landfall 150. It passed 160 miles west of Grand Gulf.
20 Gusts at that same latitude around 63 miles per hour.
21 Again, in loose comparison for that, the hourly
22 average was 14 miles per hour at the Grand Gulf site
23 which would expected just because of where the
24 hurricane was.

25 In comparison with Camille, it came much

1 closer to Grand Gulf. It was ten miles east of
2 Jackson. From your map, Jackson is slightly north
3 east the track of Grand Gulf.

4 MR. CESARE: But 60 to 70 miles east of
5 Grand Gulf slightly but Grand Gulf didn't exist then,
6 that site.

7 MR. ZINKE: Of course, Camille was a
8 stronger hurricane but more compact and as it passed
9 ten miles east of Jackson, it saw gusts in that area
10 of 67 miles per hour at the airport.

11 VICE CHAIRMAN SHACK: Is there any
12 significance to the one that's less than 92 and the
13 others that are approximately 63?

14 MR. CESARE: We're being faithful to the
15 National Hurricane Center reports that they issue and
16 in one case, for Katrina one month earlier, they
17 characterized it as less than and in this case, they
18 said approximately. So we had to stay true to it.

19 MR. ZINKE: And again, that's part of the
20 reason when we would actually do official kinds of
21 calcs in source of the data we had to be real careful
22 of that. But for this in trying to get a general
23 characterization, we're just trying to be faithful to
24 sources of data.

25 CHAIRMAN WALLIS: There are probably

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1 categories that are less than 92 and less than 80 and
2 less than so on. Isn't there or something? So it's
3 between that category and the next one.

4 MR. ZINKE: Yes. But these are actual
5 numbers not categories.

6 MR. CESARE: But these are actual numbers
7 not categories in the stations that have measured and
8 this is how they reported it. I think it's actually
9 wind measured over five seconds.

10 MR. ZINKE: Figure 13 shows the general
11 path of what Katrina did and then Figure 14 shows the
12 general path of Rita.

13 MR. CESARE: What didn't mean to infer any
14 difference between the two in the representation.
15 This is the best available graphic of the paths. They
16 go for color coded to wind velocities.

17 MR. ZINKE: And then in looking in -- Guy,
18 I'm going to let you go do the summary comparison on
19 15.

20 MR. CESARE: Very good. What we then
21 wanted to do is trying to say had these two storms
22 passed exactly over the plant how would their max
23 velocity wind gusts compare with site characteristics
24 that have been established in the application and
25 reviewed and accepted by the staff. For structural

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1 design, maximum wind gusts, that value based on the
2 industry standard that's 100 year return wind is 96
3 miles an hour. That equivalent, you've seen the
4 numbers before. Now it's just tabulated. Compares
5 close to Katrina, four miles an hour difference
6 greater than Rita.

7 The maximum one hour precipitation
8 likewise is based on an industry standard, an HMR
9 standard, which we may talk about in more detail later
10 to the degree we talk about local intense flooding.
11 But that establishes the maximum precipitation for one
12 hour 19.2 inches.

13 Now rainfall is a little bit difficult to
14 characterize. We certainly measure it but whether or
15 not the rainfall is greater or lesser at 32, two
16 issues. One is generally speaking on the eastern side
17 of the hurricane counter clockwise, it drops more of
18 its rain early rather than on the west side. So what
19 side you measure it on is important.

20 The other thing is what's happening in
21 upper atmospheres farther up in the northerly track.
22 I believe Camille, Katrina had a lot more rain over an
23 eight hour period in Virginia I believe because of the
24 mountains and the way it accumulates.

25 However at 32° north latitude, we did get

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1 some data just to show you a frame of reference to the
2 site characteristic. Newton, Mississippi is on
3 Interstate 20 which is roughly that latitude. That's
4 the National Weather Service and so we show for
5 Katrina at Newton which is to the east of the site 1.4
6 inches as the maximum rainfall.

7 For Rita, we actually had data at Grand
8 Gulf. Since Rita was to the west of the site, we used
9 Grand Gulf data as being the maximum number. It was
10 2.15.

11 I think at the site for Katrina we had 0.3
12 inches. Again, you can't take comfort in that because
13 it could drop more rain north of that.

14 Overall, we would conclude that maximum
15 wind gusts for these two data points are less than ESP
16 characteristics and the measured hourly precipitation
17 at that latitude was less than PMP, well below it.

18 MEMBER BONACA: But Katrina came quite
19 close.

20 MR. CESARE: Katrina came, it gets to what
21 you were initially talking about cycles and there is
22 some information in the literature saying that the
23 cyclone experience is a 60 year cycle and we are in
24 that phase where it would be more maximum. So you
25 will see storms that are close to the 100 year return

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1 maxs. So it's not inconsistent to have that high a
2 number for this region at this time.

3 MEMBER BONACA: Although I mean it's very
4 important somewhat the point that Dr. Powers has made
5 several times that things are changing and --

6 MEMBER POWERS: The situation, it seems
7 that the cyclical nature hurricanes is pretty well
8 established. If we were dealing on the Atlantic
9 coast, we could probably say things about how the
10 intensity varies within those cycles. The problem is
11 the historical record for Gulf of Mexico storms which
12 do seem to be different than Atlantic storms just
13 doesn't sustain enough information. So you rely on
14 modeling.

15 The modeling in this area is like the
16 modeling in most weather areas. If I find a model
17 that predicts one thing, I guarantee you there's some
18 professor someplace with a model that predicts exactly
19 the orthogonal thing. So what they've done is
20 probably the only thing you can do which is you take
21 these industry standard things and you say this is
22 what I'm going to go with because I'm not expert in
23 weather modeling and I don't intend to become one.
24 What we're looking for is some context to put this in
25 and you're giving us exactly what we're looking for.

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1 MR. CESARE: Then what is the process that
2 applies apart from the science of the modeling? What
3 is process that we would use and that's what we have
4 intended to briefly discuss here. The process is we
5 would at COL look at significant changes in events
6 information that might influence our site
7 characteristics.

8 We would look at industry standards if we
9 have based it on that industry standard and that
10 standard has been updated. That is to say a site
11 characteristic was based on the industry standard that
12 is specifically charged with looking at storm history
13 whether it's named hurricanes or other changes in
14 other event information. That standard would be
15 established and we would look at that.

16 We would evaluate them as required. If we
17 felt like it was appropriate, we would discuss those
18 changes in our application, the COLA's FSER. The
19 fundamental step then would be compare the site
20 characteristic with the parameter values that have
21 been established or assumed for analyses in the
22 selected reactor vendors at DCD and we would confirm
23 that the DCD is bounding and we would evaluate the
24 margins if they were close. That's a typical process
25 that we expect to follow at COL.

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1 In summary, the way we see this is we
2 establish the site values based on industry standards.
3 The recent hurricane experience looking specifically
4 at wind gusts and precipitation appear to be bounded
5 at this point by our established site values, we
6 believe there's a sound process at COL that would lead
7 us to evaluate new and significant information and
8 then we would consider the reactor design and margins
9 for the selected design for this site.

10 MR. ZINKE: And in fact for the Grand Gulf
11 site, we are now in that process of having picked up
12 the technology that we're looking at.

13 MEMBER POWERS: What did you pick?

14 MR. ZINKE: I'm sorry.

15 MEMBER POWERS: What did you pick?

16 MR. ZINKE: The GE ESBWR and at this point
17 decided that have not finished looking at what the
18 margins might be and obviously then that comes back
19 into your question of if the margins are real small
20 and then you get into the how sure are we that it
21 might not change over the future. Then we would deal
22 with that. If the margins are real large, that
23 conceivably that our design margin rather big, then it
24 becomes not as significant of an issue. But even then
25 if it's something that we've looked at, the standards

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1 that are developed where you would pick the site
2 characteristics, they are updated routinely. I think
3 there's been at least one update since we've
4 submitted. ASCE is now '05. I think it's within the
5 last month or two and we haven't evaluated it. We
6 would prefer not to compare it with current ESBWR
7 three second wind gust because that DCD is under
8 current review and we haven't really studied it to
9 understand what those numbers mean. It looks like
10 there's a great deal of margin but we can't say that
11 in truth.

12 MEMBER POWERS: Sure. And wouldn't expect
13 you to. To my mind, what you've provided here is
14 exactly what I was looking for, just some context to
15 put the numbers and the anecdotal information to
16 supplement what you had there in there and they are
17 important to me. It stood out to be honest with you
18 in the application that we really only had the Camille
19 thing. Now you have the Katrina and the Rita. I
20 think that satisfied what I was looking for exactly.

21 MR. CESARE: Okay.

22 MEMBER POWERS: Do other members have
23 questions? I'd like to just ask for a little
24 clarification on one aspect of the transportation up
25 the Mississippi. As I understood, you considered a

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1 bounding explosive event involving 5,000 tons of TNT.

2 MR. CESARE: Yes. That's established in
3 Reg Guide 191.

4 MEMBER POWERS: And this produces a blast
5 wave where you took some attenuation from the bluff.

6 MR. CESARE: The process was we began with
7 the Grand Gulf Unit 1 FSER which basically established
8 separation distance and other topography aspects that
9 would give sufficient protection. The Unit 1 is 1.3
10 miles. The proposed site is 1.1. So we basically
11 said there is sufficient margin in there already that
12 the slight close proximity of the ESP site would
13 still, the separation distance and the topography, the
14 bluff itself provides adequate protection. The staff
15 did additional evaluations and probably should refer
16 to them for their calculations.

17 MEMBER POWERS: We will.

18 MR. CESARE: We did, in response to
19 discussions with the Staff in RAIs, look at a delay
20 detonation where we actually did calculations on the
21 liquefied natural gas barge accident which is in the
22 application.

23 MEMBER POWERS: And you concluded that
24 that was bounded by the 5,000 ton.

25 MR. CESARE: That's a different source

1 term but we concluded its probability was very low and
2 that it should not be considered as a design basis
3 event.

4 MEMBER RANSOM: Along that line, does
5 ammonium nitrate shipped up and down the Mississippi?

6 MR. CESARE: I would assume it is.

7 MEMBER POWERS: You can count on it.

8 MEMBER RANSOM: There have been some
9 catastrophic experience with that in Houston years
10 ago.

11 MR. CESARE: You're talking about one turn
12 of the century, early 1900s.

13 MEMBER RANSOM: The World War II timeframe
14 back in there. They had a ship that blew up in the
15 harbor.

16 MEMBER POWERS: The 5,000 ton TNT was an
17 attempt to bound that.

18 MEMBER RANSOM: It would?

19 MEMBER POWERS: Oh, yes. 5,000 tons of
20 TNT is a small nuclear warhead.

21 CHAIRMAN WALLIS: Five kilotons.

22 MEMBER KRESS: For the reactor you have on
23 the site now, do you have a PRA for it?

24 MR. ZINKE: Yes.

25 MEMBER KRESS: Had you ever exercised it

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1 at a level three mode for that site?

2 MR. HUGHEY: Level three meaning
3 consequence to the public?

4 MEMBER KRESS: Yes.

5 MR. HUGHEY: Yes, we have. For certain
6 events, we do have Level three events, consequences to
7 the public. Yes.

8 MEMBER POWERS: Grand Gulf is a NUREG 1150
9 site.

10 MR. HUGHEY: It's a NUREG 1150.

11 MEMBER KRESS: I know that. It doesn't
12 use their PRA though.

13 MR. HUGHEY: No, we took NUREG 1150 as a
14 starting basis when we developed our PRA and refined
15 and modified it over the years to improve it. But,
16 yes, we started with NUREG 1150.

17 MEMBER POWERS: Grand Gulf was extremely
18 cooperative with NUREG 1150 and generous in sharing
19 their site information and developing that PR.

20 MEMBER APOSTOLAKIS: And it does meet the
21 quantitative health objectives I think as I remember.

22 MEMBER KRESS: That was my follow-up
23 question.

24 MEMBER POWERS: It does not. There is no
25 calculation done in 1150 that's comparable to the

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1 requirements for the quantitative health objectives.
2 Quantitative health objectives refer to all accidents
3 and all initiators and all modes of operation and that
4 hasn't been evaluated.

5 MEMBER KRESS: That's why I asked if they
6 exercised their own PRA because that would be the way
7 you would doodle it rather than looking at NUREG 1150
8 results. I was just curious as to how close you meet
9 these QHOs although they're not a requirement or
10 anything. They are some sort of a gauge on site
11 suitability in my mind. But you haven't done this I
12 gather.

13 MR. HUGHEY: I'm not sure exactly what
14 you're asking for.

15 MEMBER POWERS: He's fishing. He's
16 fishing for another debate.

17 MEMBER KRESS: They know me too well.

18 MEMBER-AT-LARGE SIEBER: He's actually
19 working on another part of this.

20 MEMBER APOSTOLAKIS: The question though
21 does make sense. I don't understand why it was
22 dismissed.

23 MEMBER KRESS: The question is relevant.

24 MEMBER APOSTOLAKIS: It's very relevant.

25 MEMBER KRESS: To early site permits. And

1 I'm just curious why we don't do a Level three and
2 compare the results to the QHOs and then if you're
3 going to put another plant on there --

4 (Several speaking at once.)

5 MEMBER POWERS: We do not currently have
6 the technology to do a calculation that's comparable
7 to the QHOs.

8 MEMBER KRESS: If you properly evaluate
9 the uncertainties, you might be able to.

10 MEMBER APOSTOLAKIS: I don't think that's
11 the reason, Dana. I think the reason is that the
12 regulations do not require it.

13 MEMBER POWERS: Of course not. He's
14 asking why we don't do the calculation.

15 MEMBER APOSTOLAKIS: The Grand Gulf PRA as
16 I remember includes internal events up-power plus
17 external events up-power. What it does not have is a
18 shutdown mode, right, unless you did it after?

19 MR. HUGHEY: We did it after. We did have
20 the ability through special models and a PRA to do
21 shutdown mode.

22 MEMBER APOSTOLAKIS: Okay.

23 MR. HUGHEY: Because we were a follow-up
24 to NUREG 1150 and we were one of the first plants to
25 do a full shutdown mode PRA.

1 MEMBER APOSTOLAKIS: So if you take all of
2 these results and put them together, do you remember
3 if you meet the goals, the 10 to the minus whatever?

4 MR. HUGHEY: Yes, we meet all the current
5 safety goals. We've always met those. I can't say
6 though that again it would be what type of events.
7 For example, we don't have seismic in our PRA.

8 MEMBER APOSTOLAKIS: You don't?

9 MEMBER DENNING: What about fire?

10 MEMBER APOSTOLAKIS: Fire, they do.

11 MR. HUGHEY: We do.

12 MEMBER DENNING: You have a fire PRA?

13 MR. HUGHEY: I think on fire we did
14 screenings.

15 MEMBER DENNING: You did screenings.

16 MR. HUGHEY: I think we did screenings on
17 them. It's been many years since I've looked at our
18 PRA because I'm not in the operations division any
19 longer. So I guess I would probably have to say that
20 I can't answer every question directly on that.

21 MEMBER DENNING: If you look at the
22 internal events analysis, that shows significant
23 margin to the QHOs but I think Tom's question and
24 Dana's question relate to the question that's not a
25 complete characterization of all of the contributors.

1 So until you have done a fire PRA and a seismic PRA
2 and include a shutdown PRA, then you haven't really
3 totally addressed whether you meet the QHO.

4 MEMBER KRESS: I would settle for an
5 internal events comparison if you really want to know.

6 MEMBER DENNING: Well, that you can --

7 MEMBER POWERS: I'd still like to stick to
8 early site permit. Do we have any early site permit
9 questions for the speakers?

10 MEMBER KRESS: How far is it to New
11 Orleans and Memphis?

12 MR. HUGHEY: From Grand Gulf?

13 MEMBER KRESS: Yes.

14 MR. HUGHEY: Two hundred miles.

15 MEMBER KRESS: A good distance.

16 MR. HUGHEY: Yes. Memphis is probably 225
17 or so and New Orleans is right at 200.

18 MEMBER KRESS: St. Louis?

19 MR. HUGHEY: St. Louis.

20 MEMBER AT LARGE SIEBER: That would be a
21 bit further.

22 MEMBER POWERS: Gentlemen, thank you very
23 much. Turn to the staff. Laura, did you want to
24 introduce?

25 MS. DUDS: Sure. In the interest of

1 efficiency and effectiveness as we turn towards fiscal
2 year 2008 and we're going to be looking at eight to
3 ten of these reviews, we'll do the intro while the
4 Staff is setting up. My name is Laura Duds. I'm the
5 Branch Chief for the New Reactor Licensing Branch.

6 Before I start, I did want to take a
7 moment to express our gratitude and our appreciation
8 for Med. Yesterday Jerry Wilson was expressing to me
9 that Med has been with New Reactors group through
10 three, four design certification projects and we
11 really wanted to say thank you and wish you all the
12 best.

13 In addition, this is going to get sad
14 actually after awhile when we continue to say goodbye
15 to these people. Sitting behind me, Kaz Campe has
16 provided the site hazards analysis for the ESPs as one
17 of several thousand activities and safety conclusions
18 that he's done for the Staff. So we wanted to thank
19 him for his help and we appreciate working and
20 learning from both of you.

21 PARTICIPANT (MED): Thank you, Laura.

22 MS. DUDS: You're welcome, Med. With
23 that, we're here today to present our final safety
24 evaluation for the Grand Gulf ESP application. The
25 Staff has completed our review for this application in

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1 accordance with the existing regulations and the
2 current guidance that the Staff is working to. I do
3 want to make the point that due to some late changes
4 in the Dominion North Anna early site permit
5 application Grand Gulf is now our lead early site
6 permit plant which means they will be the first plant
7 to go through the mandatory hearing. With respect to
8 the changes in North Anna, we expect to see the extent
9 of those changes in early January and we will work
10 with your staff to see if additional interactions are
11 needed.

12 With that, I'm going to introduce Raj
13 Anand who is the Project Manager for the Grand Gulf
14 early site permit. Also Nitin Patel sitting beside
15 him is new to our Staff working on early site permits
16 and I seem to have to introduce new people every time
17 we're here.

18 MEMBER POWERS: If you wouldn't drive them
19 away, you're going to have to bring in new people.

20 MS. DUDS: I know. And here I got
21 honorable mention in trying to hire Med yesterday but
22 our staff is continuing to grow and we're turning
23 forward. So with that, Raj.

24 MR. ANAND: Thank you, Laura. Good
25 morning. My name is Raj Anand and I'm the Safety

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1 Project Manager for the Grand Gulf early site permit
2 application. I have with me Nitin Patel. Nitin will
3 help me in flipping the slides. So let me get started
4 on slide no. two please.

5 The purpose of today's meeting is to
6 provide the ACRS committee members an overview of the
7 conclusions reached by the Staff in Grand Gulf early
8 site permit safety review and discuss the permit
9 conditions recommended by the Staff and the COL action
10 item listed in the final safety evaluation report.

11 This is today's agenda for my
12 presentation. My presentation will be less than 25
13 minutes.

14 MEMBER POWERS: If I don't interrupt.

15 MR. ANAND: You can ask the question.
16 Thank you. The final safety evaluation report
17 documents the Staff's technical review of the site
18 safety analysis report and the emergency planning
19 information submitted by the Applicant for the Grand
20 Gulf early site permit site.

21 The Applicant, the SERI, requested that
22 their ESP site be approved for a total nuclear
23 generating capacity of up to 8,600 megawatts thermal
24 with a maximum 4,300 megawatts thermal per unit. The
25 Applicant declined to submit a specific design at this

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1 stage but the Applicant has submitted plan design
2 parameters that are representative and the intent to
3 be the bounding for those reactor designs such as
4 advanced boiling water reactor, Westinghouse AB-1000,
5 GE Economic Simplified Boiling Water Reactor, IRIS
6 Pebble Bed Modular Reactor.

7 The Staff has reviewed the Applicant's
8 plan parameters from the standpoint of whether they
9 are reasonable. It is then Applicant's burden to make
10 sure that they pick up parameters such that when they
11 come in for the combined license application with the
12 actual design that it fits within those parameters.

13 I just wanted to mention that NRC Staff
14 was benefitted from a number of experts' input to the
15 safety evaluation report. In hydrology, we have had
16 the support from Pacific Northwest Lab. In some
17 cases, the lab did the independent evaluation of
18 Applicant's evaluation and conclusions. PNL also
19 supported the site hazard review. In the geology and
20 seismic area, the Staff was benefitted from the
21 support from the United States Geological Survey and
22 Brookhaven National Lab. In emergency planning, the
23 Staff consulted extensively with the Federal Emergency
24 Management Agency (FEMA). So we had a large team
25 involved in reviewing the Grand Gulf ESP application.

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1 The review conducted by the Staff
2 confirmed that SERI application complies with the
3 requirement of Subpart A of 10 CFR Part 52 which
4 governs the early site permit and the Part 52
5 references the Subpart B of 10 CFR Part 100 which
6 contains the citing criteria. The Staff determined
7 that the Applicant's exclusion area is acceptable and
8 meets the requirement of Part 100 subject to the
9 limitation and conditions identified in the final
10 safety evaluation report.

11 Permit Condition 1 which I will discuss
12 later in my presentation provides a reasonable
13 assurance that the ESP provides for the control of the
14 exclusion area. The Staff independently verified the
15 adequacy of Applicant's dose consequences calculation
16 from normal operations and concluded that the proposed
17 site is acceptable for constructing a plant falling
18 within the planned parameters with respect of the
19 radiological effluent dose release consequences from
20 normal operation.

21 The Staff reviewed the Applicant's
22 aircraft analysis and independently verified the
23 assessment of the aircraft hazards at the site. The
24 Staff concluded with respect to the aircraft hazards
25 that the proposed site is acceptable for constructing

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1 the plant that fall within the PPE.

2 MEMBER-AT-LARGE SIEBER: What would make
3 the site unacceptable from the aircraft hazard
4 standpoint?

5 MR. ANAND: We have contacted FAA and we
6 have also discussed with them if there is any big
7 airport coming near to the site later on and also we
8 looked at the topography for any local airports near
9 to the site as well as the major international airport
10 which is Jackson, Mississippi which is located is 65
11 miles northeast. We also looked at the frequencies of
12 the aircrafts that travel in and around the Grand Gulf
13 site.

14 MEMBER-AT-LARGE SIEBER: Okay.

15 MR. SCOTT: Jack, could I add a comment?
16 Mike Scott, ACRS Staff. The infallible Early Site
17 Permit Review Standard also contains acceptance
18 criteria for when you need to do further work in that
19 area when the flight densities are too great or the
20 airports are too close or whatever.

21 MEMBER-AT-LARGE SIEBER: But there are
22 current plants that are within the control zones of
23 major airports already existing and do they meet the
24 regulations?

25 MR. SCOTT: The Early Site Permit Review

1 Standard of course is not a regulation. It's
2 guidance.

3 MEMBER-AT-LARGE SIEBER: Right. But the
4 mere fact that the site may be within the control zone
5 of an airport probably would not exclude that site
6 from consideration for an ESP. Is that true or not
7 true?

8 MR. SCOTT: I believe we can get Kaz Campe
9 to speak to that since that's his area.

10 MR. CAMPE: Kaz Campe, NLR. The question
11 of what it would take in terms of aircraft hazards in
12 order for it to be not acceptable if I understand the
13 question, first of all, the aircraft hazards when
14 they're evaluated are evaluated in a cumulative
15 fashion without picking out particular features such
16 as airports or airways, training routes, what have
17 you. All of those things are looked at and in the
18 end, all of them are aggregated into a single overall
19 likelihood or probability of an aircraft crash on site.

20 And the determination is then whether or
21 not it is within the acceptance criteria as spelled
22 out in the standard review plan. So if the air
23 frequency of an aircraft crash on site exceeds that
24 criterion, then you do not have an acceptance at that
25 point and then you have to go back and have another

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1 look.

2 That other look can take several different
3 forms. You can refine the analyses looking at the
4 conservativisms. Ultimately this is all done with the
5 assumption that there's no protection. So ultimately
6 you can go into taking into account the structures and
7 their physical features doing structural analysis and
8 so on, consequence analysis. So those are the things
9 that can be examined. But the main criterion is one
10 of whether or not it meets the frequency that's
11 considered an acceptance level.

12 MEMBER-AT-LARGE SIEBER: Okay. Thank you.

13 MR. ANAND: With their evacuation time
14 estimates, the Applicant has shown that no physical
15 character stakes unique to the proposed ESP site would
16 propose a significant impediment to the development of
17 the emergency plans. The Staff concluded that the
18 Applicant's proposed major features of the emergency
19 plans are acceptable and meets the NRC requirements.

20 The Staff had not approved the Major
21 Feature H which deals with the emergency facilities
22 and related equipment. The Applicant has not provided
23 the sufficient information concerning emergency
24 facilities and equipment at this time. Therefore, the
25 Major Feature H is not approved in the final safety

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1 evaluation report.

2 The Staff has concluded that the Applicant
3 provided an acceptable description of the current and
4 projected population densities in and around the site
5 and properly specified the low population zone and
6 population center distance.

7 With respect to the Committee's comments
8 on the potential accidents associated with the nearby
9 river transportation, the Staff has updated the
10 discussion of the assessments of the explosions, fire
11 and toxic chemical released in the final safety
12 evaluation report.

13 With respect to the release of the toxic
14 gases from the chemical such as anhydrous ammonia and
15 chlorine in a potential river barge accident, the
16 Staff has analyzed the accident for the Grand Gulf
17 operating reactors and have estimated that the
18 toxicity level in the control room is acceptably low.
19 Since the design of the new reactor, the control room
20 is not known at this time. The Staff will evaluate
21 such accidents at the COL application stage.

22 The Staff has identified this as a COL
23 action item in the final safety evaluation report. So
24 based on its review, the Staff has concluded that the
25 potential hazard associated by the nearby

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1 transportation routes, industrial and military
2 facilities, pose no undue risk to the proposed ESP
3 site.

4 MEMBER POWERS: Your analyses of the
5 transportation accident include examinations of a
6 5,000 ton blast.

7 MR. ANAND: Right.

8 MEMBER POWERS: In that analyses, you
9 conclude that a separation of 2.1 miles would be
10 needed. But then you argue that there is an
11 attenuation of that shock wave due to the bluff and
12 you appeal to a preceding citation that I
13 unfortunately have not been able to retrieve and
14 examine. Can you explain to us why that particular
15 citation is deemed authoritative?

16 MR. ANAND: May I request?

17 MR. CAMPE: Kaz Campe. If you could
18 possibly just repeat the last part. I didn't quite
19 catch the last part of your question.

20 MEMBER POWERS: In essence, I want to
21 understand why that blast attenuates a shock wave so
22 that the separation that goes from two miles down to
23 it says 1.3. I think it's actually 1.1 and the basis
24 for what appears to be a proceedings citation for
25 blast dynamic analyses. The title of it is something

1 like "Why We Should Use Blast Dynamics In Safety
2 Assessments." I have not been able to retrieve or
3 examine that citation. But for some reason, it's
4 deemed authoritative and that does not smack of an
5 authoritative document to me. So I'm trying to
6 understand why is that authoritative. Why can that be
7 the basis for a substantial reduction in the required
8 separation?

9 MR. CAMPE: I'm not sure if I was
10 emphasizing the authoritative aspects of it. I was
11 citing a reference of an Arthur D. Little study that
12 was made. That is not to say that that is the only
13 thing I've looked at. That is one of the more
14 complete coverages of the topic and so I thought it
15 would be appropriate to list it.

16 In my studying this aspect, I have looked
17 at several sources that all seem to have a general
18 indication of the types of reduction factors that one
19 can get from obstacles that are in the way of an
20 incident over pressure wave that said to me that we
21 may not have it precisely perhaps but it's certainly
22 factors of the type that I found in this study by
23 Arthur D. Little and that's what was used as a basis
24 for concluding that it's a reasonable thing to expect.

25 I have found other calculations in

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1 reference to architectural studies with intentional
2 threats being the focus where deliberate obstacles
3 were being introduced as part of an architectural
4 design in order to reduce the magnitude of an incident
5 blast that seemed to be also in agreement with what
6 this study did.

7 So in essence what I'm saying is I wasn't
8 focusing or picking out a singular reference and
9 hanging it all on that but actually looked across the
10 board and saw general agreement and just simply picked
11 this one as a representative one. I'd be happy to
12 supply the copies of this if that would help.

13 MEMBER POWERS: I'm struggling with trying
14 to understand the configuration that was analyzed. If
15 I look at the line of sight between the center of the
16 transportation corridor, actually the bank of the
17 transportation corridor, at the bluff, do I see the
18 top of the facility? I think I do. So now do I get
19 the attenuation from the bluff over the entire height
20 of the facility?

21 MR. CAMPE: At the very least, the direct
22 line of sight would only be applicable to the incident
23 over pressure wave front when in fact conservatively
24 one includes the reflective wave which is additive and
25 that would be traveling along the topographical

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1 surface and that would be subject to this attenuation
2 by the existence of the bluff. The incident wave is
3 one-half of the total over pressure that one sees on
4 the floor surface facility.

5 MEMBER POWERS: If my facility is exposed
6 to the incident, it's going to get the reflective.
7 It's going to reflect off the building. You're going
8 to get the impulse from both of them if there's a line
9 of sight. What I'm concerned about is I think the
10 sighting study looked at barriers to completely
11 obscure the facility and it's not clear to me that
12 this facility is completely obscured by the bluff.
13 Maybe I'm wrong. I just don't understand what you're
14 analyzed.

15 MR. CAMPE: I at the same time am not
16 clear how a direct line of sight without taking into
17 account existence of bluff would necessarily still
18 involve a reflective over pressure wave. I'm hearing
19 what you're saying and I don't quite see it that way.
20 But I would have to look at that.

21 MEMBER POWERS: I think it can be safe to
22 say I don't understand this analysis.

23 MR. CAMPE: All I can say is I can try to
24 provide further clarification on this particular
25 aspect.

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1 MEMBER POWERS: Good. Please continue.

2 MR. ANAND: Thank you. The Applicant has
3 discussed with you the climate and methodology used to
4 determine the severity of the weather phenomena. The
5 Staff has also concluded that Applicant's proposed
6 site characteristics related to climatology and the
7 methodology used to determine the severity of the
8 weather phenomena reflected in the site
9 characteristics are acceptable and contends sufficient
10 margin for the limited accuracy, quantity and the
11 period of time in which the data has been accumulated
12 in accordance with GDC-2 of Appendix A to 10 CFR Part
13 50.

14 The Staff also acknowledges that the long-
15 term climate change resulting from human or natural
16 causes may introduce changes into the most serious
17 natural phenomena reported for the site. However, no
18 conclusive evidence or consensus of opinion is
19 available on the repetitiveness or natural such changes.

20 If in the future the ESP site is no longer in
21 compliance with the terms and conditions of the ESP,
22 for example, if new information shows that the climate
23 has changed and the climate and site characteristics
24 no longer represents the same weather conditions, the
25 Staff may seek to modify the ESP or impose

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1 requirements from the site in accordance with the
2 provisions of 10 CFR 5239 "Finality of Early Site
3 Permit Determination" if necessary to bring the site
4 into compliance with the Commission's requirements to
5 assure adequate protection of the public health and
6 safety.

7 The Staff also concluded that the
8 Applicant's proposed site characteristics related to
9 the hydrology are acceptable with the noted permit
10 condition and COL action items which are discussed
11 later in my presentation. In addition, the Staff
12 independently verified that the flood in the
13 Mississippi River is not a threat to the ESP site.
14 The Staff also consulted with the Corps of Engineers
15 and the Staff independently verified that the ESP site
16 is safe from flooding. The Staff concluded that the
17 proposed ESP site is acceptable from the geology and
18 seismic standpoint and meets the requirement of 10 CFR
19 Part 100.23, "The Geologic and Seismic Criteria."

20 As we all know, the proposed Grand Gulf
21 ESP site is located in a relatively low seismic
22 region. The Applicant has identified no active
23 seismic faults within the 90 mile radius from the
24 location of the ESP site and no earthquake recorded
25 within a 25 mile radius since 1777.

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1 The Grand Gulf site is a deep soil site.
2 The Applicant has used the regulatory guide 1.165 for
3 identification and characterization of seismic sources
4 and determination of safe shutdown earthquake ground
5 motion. The Regulatory Guide 1.165 describes method
6 acceptable to NRC Staff for the determination of SSE.
7 Therefore, the Staff concludes that the ESP site meets
8 the requirement of Part 100. Finally, the Staff
9 concluded that the Applicant provided appropriate
10 quality assurance measures equal to those required by
11 the 10 CFR Part 50, Appendix B.

12 The Staff review included all the
13 different area lists in the Slides 8 and 9. The
14 bolded text referred to in the two slides refers to
15 the area that contains open items in the draft safety
16 evaluation report. There were a total of 23 open
17 items in the draft safety evaluation report as
18 indicated on Slides 8 and 9. All those open items
19 have been resolved in the final safety evaluation
20 report. The Applicant has addressed in a matrix form
21 the key open items in their presentation. So I will
22 not go more into details on these open items.

23 During the North Anna early site permit
24 review, the Staff with the assistance from the Office
25 of General Counsel developed criteria for proper

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1 characterization of permit conditions and site
2 characteristics and COL action items in the final
3 safety evaluation report. We applied the same
4 criteria to develop permit conditions and COL action
5 items in the Grand Gulf final safety evaluation
6 report.

7 The Staff has proposed three permit
8 conditions in the final safety evaluation report.
9 There were ten permit conditions in the draft safety
10 evaluation report. In addition, the Staff has
11 identified 26 COL action items in the final safety
12 evaluation report which includes the remaining seven
13 permit conditions identified in the DSER. I will
14 discuss the COL action items later in my presentation.

15 Here are the three proposed permit
16 conditions in the Grand Gulf final safety evaluation
17 report. The Staff proposes to include a condition in
18 the early site permit that might be issued in
19 connection with the application to go under exclusion
20 area control before construction begins under a
21 construction permit or COL referencing the ESP. The
22 Applicant must obtain and execute an agreement
23 providing for shared control of the Grand Gulf ESP
24 exclusion area including Staff's approval.

25 Permit Condition 2 requires the new unit

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1 radwaste system to be designed with a feature to
2 preclude any and all accidental releases of
3 radionuclides into the potential liquid pathway. The
4 reason we propose this permit condition is that the
5 Applicant has not made the decision as to what a
6 specific design might ultimately be built at the ESP
7 site. Therefore, the exact location of the radwaste
8 storage facilities and the accidental release points
9 of liquid effluent in the ground and surface water is
10 not known at this time.

11 Since the soil properties such as the
12 absorption and retention coefficient cannot be
13 determined from the location of the potential
14 radionuclides release on the ground, the Staff
15 concluded that the issue could be best resolved if
16 there is no release of radionuclides for the ground
17 water. Accordingly, the Staff proposed this permit
18 condition and the Applicant is okay with this permit
19 condition.

20 The Permit Condition No. 3 states that the
21 early site permit holder or an applicant referencing
22 the ESP must perform a geologic mapping of the future
23 excavation for safety-related facilities.

24 I discussed earlier that there are 26 COL
25 action items identified in the final safety evaluation

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1 report. The purpose of the COL action items are to
2 ensure that the Applicant issues and tracks and
3 considers these issues in the COL phase. COL action
4 item identify and highlight what is needed at the COL
5 stage. This is similar to the established concept in
6 the design certification. The list of the COL action
7 items in the SER is by no means all inclusive. They
8 are all listed in Appendix A to the final safety
9 evaluation report.

10 The following are the major milestones for
11 the project. I would like to highlight the following.
12 The Staff received the Grand Gulf application in
13 October 2003 and the Staff issued the final safety
14 evaluation report on October 21, 2005. The future or
15 the remaining milestones are that the Staff requests
16 that the Committee provides a letter to the EDO by
17 December 22, 2005 giving their recommendations.

18 The Staff will then issue a NUREG by
19 January 28, 2006 which will include the ACRS letter
20 concerning the Grand Gulf early site permit
21 application and the Associate's and the Staff's final
22 safety evaluation report.

23 There are mandatory hearings for the early
24 site permit applications. These mandatory hearings
25 will begin in 2006. There are not contentions

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1 admitted in the SSE application. The uncontested
2 hearing will begin upon the completion of the Staff's
3 final involvement of impact statement which is due to
4 be published on April 14, 2006. The ESLP decision is
5 due in December 2006. Commission decision for the
6 Grand Gulf early site permit is expected in January
7 2007.

8 In summary, the Staff issued the Grand
9 Gulf early site permit final safety evaluation report
10 on the schedule. The Grand Gulf early site
11 characteristics with the limitation and condition
12 proposed by the Staff comply with the Part 100
13 requirements.

14 Reactors having characteristics that fall
15 within the parameters identified in the ESP and which
16 meets the terms and conditions proposed in the final
17 safety evaluation report can be constructed and
18 operated without undue risk to the health and safety
19 of the public.

20 Staff review concludes that the issuance
21 of the Grand Gulf ESP will not be harmful to the
22 common defense and security or to the health and
23 safety of the public. We believe that the Staff has
24 done an outstanding job in preparing this final safety
25 evaluation report and we appreciate the Committee's

1 efforts for the issuance of a letter so that we can
2 issue the NUREG by January 28, 2006. This concludes
3 my presentation. I'll be happy to address any
4 questions if you have. Thank you.

5 MEMBER POWERS: Members have any questions
6 for the speaker? Thank you very much. Mr. Chairman.

7 CHAIRMAN WALLIS: Ms. Duds has a statement
8 to make.

9 MS. DUDS: No, I don't want to be a
10 glutton for punishment on this bluff issue regarding
11 the erosion but I just wanted to clarify and see if
12 the Applicant had anything to add regarding the
13 Staff's looking at the topography and identifying a
14 certain attenuation and accepting some credit for that
15 bluff. I wasn't sure that we could provide more
16 information at this time.

17 MR. ZINKE: We really can't because this
18 was an issue or a subject we took different approaches
19 on and that's why I really can't add anything to that.

20 MS. DUDS: Okay. Thank you, George.

21 CHAIRMAN WALLIS: So we now are finished.
22 Anyone wish to anything more on this matter? I think
23 we're really to take a break and we can not start
24 again until our next item on the agenda which is at
25 10:30 a.m. So we are lucky because of the great job

1 done by the presenters that we're ahead of time and
2 we'll take a break until 10:30 a.m. Thank you. Off
3 the record.

4 (Whereupon, the foregoing matter went off
5 the record at 10:02 a.m. and went back on the record
6 at 10:33 a.m.)

7 CHAIRMAN WALLIS: On the record. Please
8 come back into session. The next topic on the agenda
9 concerns potentially degraded fire barrier materials.
10 I'll turn to my colleague, Rich Denning, to lead us
11 through this one. Rich, go ahead.

12 MEMBER DENNING: Okay. Thank you. In
13 March and April of this year as you're all aware, the
14 NRC undertook some preliminary testing and
15 demonstrated the hazards of conformity research and
16 that is that you might find out that things aren't the
17 way that you thought they were. So what we're going
18 to hear about today is a little explanation of what
19 actually was observed in these tests on the Hemyc/MT
20 fire barriers and then what we're really here for is
21 to consider the generic letter to be issued to the
22 industry to understand exactly where these materials
23 are being used and to identify plans for how we're
24 going to do corrective actions to the extent that
25 those are required. Sunil Weerakkody will make the

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1 introductory statements.

2 MR. WEERAKKODY: I'm Sunil Weerakkody.
3 I'm the Chief of Fire Protection Branch in the
4 Division of Risk Assessment. The reason we are here
5 today in front of the ACRS is to personally draft a
6 generic letter that we have put together entitled
7 "Impact of Potentially Degraded Hemyc/MT Fire Barrier
8 Materials on Compliance with Fire Protection Program."
9 The objective of today's presentation is to obtain the
10 ACRS endorsement on the proposed generic letter.

11 I do want to before I go to the two
12 bullets there introduce the three people who will be
13 in front of you making presentations and answering
14 your questions. First, Mark Salley who is the Team
15 Leader for Fire Research from the Office of Research.
16 Mark led the effort to run the Hemyc testing and gave
17 us the results that we used to engage the industry and
18 ask them to take the appropriate actions.

19 And Angie Lavretta joined the Fire
20 Protection section about a year ago. In fact, our
21 work load increased because of the Hemyc issues and
22 she's been the lead for the generic letter on Hemyc
23 and she'll be making the presentation on the
24 regulatory actions on the generic letter. She will
25 follow Mark who will provide the presentation on the

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1 research test results.

2 Then Dan Frumkin used to be a Fire
3 Protection engineer. He's been with NRR for the last
4 ten years. So he's cognizant of all regulatory and
5 risk kind of aspects of Hemyc and other fire barriers
6 for NRR.

7 Getting back to these slides, as I said
8 the generic letter that we plan to issue for which we
9 are going to ask your endorsement is going to request
10 that each of the licensees who receive the generic
11 letter identify whether they rely on Hemyc and MT and
12 other material for the separation of fire barriers at
13 their plants to comply with the regulations. Then the
14 same letter is going to request the effected licensees
15 to provide a description of the installation, discuss
16 whether the installation is in compliance in light of
17 the new information that we will be disseminating with
18 the generic letter and tell us what kind of
19 compensatory actions they have taken and also tell us
20 if they conclude that they're not in compliance how
21 they plan to establish compliance with the
22 regulations.

23 CHAIRMAN WALLIS: I guess we'll get into
24 this when we go into the details but I had a lot of
25 trouble understanding how your tests helped the

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1 licenses understand how their particular
2 configurations would be in compliance or not. Maybe
3 we'll get into that in the details.

4 MR. WEERAKKODY: We would towards the
5 end.

6 CHAIRMAN WALLIS: You should have done
7 some limited tests and there ask a sweeping review of
8 everything they have to see if it's in compliance. I
9 wasn't sure you were giving them enough information to
10 figure that out. Perhaps we'll get into that.

11 MR. WEERAKKODY: I could answer that now
12 or I could wait until the end of the presentation.

13 CHAIRMAN WALLIS: Well, if you have a
14 quick answer.

15 MR. WEERAKKODY: Okay. I have a quick
16 answer. We gave enough information to question
17 whether they are in compliance and some licensees like
18 for example Vermont Yankee, they concluded that it was
19 sufficient for them to go out and renew and replace
20 their material. Then you have other licensees who
21 basically said to us and in fact are performing
22 additional testing to see whether this applies to
23 them.

24 CHAIRMAN WALLIS: So they have to do
25 additional testing.

1 MR. WEERAKKODY: Some licensees are doing
2 additional testing. Dan, did you want to say
3 something?

4 MR. FRUMKIN: Yes. This is Dan Frumkin of
5 the Staff. Just one more thing, the configurations
6 that we developed for our testing were developed based
7 on input from the industry. They reviewed our test
8 report. We incorporated many of their comments. So
9 with the amount of resources we had to do the tests,
10 this was as representative as possible of the
11 licensee's testing or installations.

12 MR. WEERAKKODY: Unless you have
13 questions, I would like Mark to provide the RES
14 presentation.

15 MR. SALLEY: I'm Mark Salley from the NRC
16 Office of Research. I have Roy Woods with me in the
17 audience. Roy was the Program Manager for this. So
18 we should be able to cover everything for you. This
19 presentation is pared down. We could talk all morning
20 about the testing and we have ten minutes to do that.
21 So that's about right. But I would like to give you
22 the quick, verbal presentation and then we have some
23 photos at the end that we'll show that hopefully what
24 I talk about will draw it all together.

25 Hemyc is a fire barrier material. This

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1 goes back to 1980 timeframe with protecting the same
2 trains within the same fire area, the same problem
3 that the Thermo-Lag was used for. You all remember
4 back from '92 era the Thermo-Lag. This is another
5 material that was used to do that.

6 It's a very simple fire barrier and I'll
7 pass a piece around for you all to look at here. What
8 it basically is is a high temperature fabric. You'll
9 hear this referred as sag "welding cloth" or you'll
10 hear the brand names, Refrasil or Siltemp is a very
11 common one back in the '80s. Siltemp was probably the
12 biggest manufacturer of it and you basically take the
13 Kaowool which we've looked at before, a ceramic fiber
14 material and you sew it into blankets or pillows or
15 mats. You then go and install this around the raceway
16 and that is the fire barrier system.

17 While I have this in front of me and I'll
18 pass it around, you'll notice a difference which we'll
19 discuss and that's the color. This is brand new
20 Refrasil material. You'll see that it's a tan color.
21 This is an actual color that was wrapped around where
22 two joints came together. If you picture it, this was
23 wrapped around. It's an actual color that came out of
24 the fire test. You know the color has changed and
25 that will be important later. But the cloth reacts

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1 thermally to the flux from the furnace and it does
2 some interesting things. So it's a very simple fire
3 barrier system. I'll pass it around. George.

4 Hemyc, it's interesting too when you work
5 these problems. What does Hemyc mean? We've thrown
6 the word around for years. It's interesting that back
7 in the 1980s when Appendix R was first put into play
8 people were wondering how do we solve the problem and
9 a Spanish insulation firm by the name of Hemyc came up
10 with one solution. This is the company that developed
11 it if you will in Spain. Their company name is Hemyc
12 and that's what this barrier system has been referred
13 to.

14 There's nothing proprietary or anything
15 special about it. Like I said, it's commercial grade
16 Kaowool, two inches of Kaowool, wrapped with a
17 commercial grade, high temperature welding cloth. So
18 it's not like the Thermo-Lag where you had this secret
19 proprietary mix type kind of thing. You could make
20 these up in your garage and Jack could be installing
21 them in Beaver Valley if we were 40 years ago. So
22 it's nothing special, but that's where the name Hemyc
23 comes from. It's the name of the company.

24 There's also another variety. Hemyc is
25 what we refer to as the one hour barrier. There was

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1 also a three hour version and the three hour version
2 of the material was called MT. It's very similar to
3 the Hemyc. As a matter of fact, when you look at the
4 installation procedures, the first layers that go on
5 are basically the one hour Hemyc configuration. They
6 then put a second layer on where they put some packets
7 of some material in there to absorb the energy. So
8 the two designs are similar both one and three hour.
9 One hour is predominant. I think there's only one or
10 two plants that use the three hour.

11 VICE CHAIRMAN SHACK: Do these packets
12 absorb energy by a phase transition or something?

13 MR. SALLEY: I'm trying to remember. Roy,
14 do you remember what the chemical was in the packets?
15 It was noncombustible.

16 MR. FRUMKIN: Yes. It was hydrate. It's
17 a saturated salt substance with water and as it heats,
18 the water boils off.

19 MR. SALLEY: Theoretically when the packet
20 is broke, it looked like sand running out. But that
21 was the design.

22 Testing, it was straight up testing, full
23 scale testing. It was done to NFPA 251 which is the
24 same as ASTM E 119 as far as standard time/temperature
25 curve. As far as the amount of instrumentation, how

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1 the configurations were done, we used Generic Letter
2 8610 Supplement 1. So the testing was standardized.
3 It's the same standardized testing we've done since
4 the mid '90s.

5 Just to review quickly, we had some
6 options in here. Graham, you would alluding to how we
7 tested to represent industry. Let me answer that now
8 or at least take a stab at it. When we did the
9 installations, we followed the vendor manual pretty
10 much to the letter and we had the original vendor
11 Promatec. So we used their people.

12 We had continuity as the craftsmen who did
13 the original work. We had as close to that as we
14 could get. We followed the vendor manual to the
15 letter. Where they said a minimum six inch collar, we
16 had them cut a minimum six inch collar and that's how
17 we set the testing up.

18 The standard says to test empty which will
19 give us our worst case configuration. We did that.
20 We also had room inside the test deck because the
21 lessons we had learned from Thermo-Lag was that if you
22 have a heavier thermal mass you have more thermal
23 inertia. It takes longer to heat up. The
24 temperatures tend to run cooler.

25 Based on that experience in the spare

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1 areas in the deck, we put the same configurations but
2 we fully loaded the conduits. And before we lit the
3 furnace, what we fully expected to see if we did see
4 failures was that the empty ones being lighter would
5 fail first and we'd see progressively as the heavy
6 conduits would last longer in the furnace. That's
7 what we were looking for when we started the testing.

8 Again, the criteria, it's the average
9 temperature rise of the raceway being less than 250°
10 for acceptance with no single point exceeding 325°
11 Fahrenheit above the ambient start of the test. There
12 would also be a hose stream test. Again we were using
13 the same hose stream we used in Thermo-Lag and it's
14 often used for pen seals and that's the fog nozzle
15 test.

16 The first test was conducted in March of
17 2005. In here we put an array of conduits. We had
18 two one inch, two inch and a half and two four inch,
19 one being empty, the other being fully loaded. Again
20 we were trying to look for the difference that the
21 cable mass gives us. We also had one, if you will,
22 typical sized junction box in the assembly and one
23 thing we noticed about the vendor manual, again
24 lessons learned from Thermo-Lag, was they only
25 required the structural steel to be protected three

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1 inches away from the barrier.

2 Now other vendors have used as much as 18
3 inches and the physics being the same, if you heat up
4 the tube steel or the Unistrut you know it's going to
5 conduct heat energy into the barrier system. We
6 thought three was awful short and we didn't want to
7 biased the tests just because of this thermal short we
8 would lose the data on the raceways. So we separated
9 the supports from the raceways. The raceways hung
10 supported outside the test assembly and we had
11 separate instrumented supports so that we could gather
12 the data to see the heat transfer back through the
13 material.

14 What we saw when we did the testing was
15 that the raceways from the one to the four inch that
16 failures occurred between 33 and 43 minutes. The
17 other thing was that it was random in the failures.
18 We didn't see the empty one inch fail first and the
19 loaded four inch fail last as we had expected.

20 CHAIRMAN WALLIS: What does failure mean
21 in a test like this?

22 MR. SALLEY: Failure means that you
23 exceeded the delta T max so that 325° single point --

24 CHAIRMAN WALLIS: Which doesn't mean they
25 all fell apart or something?

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1 MR. SALLEY: No. It means thermally you
2 did not keep the interior of the conduit cool enough
3 to insure the functionality of the cable. Again, our
4 results were mixed. We didn't see them failing in the
5 order we expected them and when we looked at the
6 assembly what we had discovered really for the first
7 time was a phenomena of thermal shrinkage.

8 If you see the piece of Hemyc that's being
9 passed around, you'll notice that the color has
10 changed. It's changed from a tan to a white. What
11 happens here is when the material is going through
12 this change it actually shrinks and during the
13 shrinking process what we now saw was breaches in the
14 barrier. So at the point where it shrunk inside the
15 testing, we now had a breach which exposed the conduit
16 to the furnace which you could see the thermal couples
17 peg right up. And that failure was random throughout
18 the assembly.

19 CHAIRMAN WALLIS: Someone is going to ask
20 this sometime I'm sure. Now we had Thermo-Lag and it
21 failed tests and we had Kaowool which failed and this
22 stuff which has been installed for some time is now
23 failing. One would think that all these tests would
24 have been done ahead of time so that you don't put
25 stuff out there and then have to take it off again and

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1 find something better. It seems to have happened
2 three times now. What's going on here?

3 MR. SALLEY: There's a number of reasons
4 for that, Graham. I'll answer part of that and I'll
5 let Dan answer the regulatory part. If you go back to
6 Brown's Ferry '75.

7 CHAIRMAN WALLIS: A long time ago.

8 MR. SALLEY: I remember, but I guess I'm
9 getting old. There was no test for penetration seals
10 before Brown's Ferry and after that, all of a sudden
11 we need this test method for penetration seals. This
12 is important. Then ASTM and UL and all the factory
13 and everybody developed test standards. When this was
14 installed in the '80s, again follow E-119. E-119 is
15 for building materials and follow the section on
16 partition walls.

17 Well, that criteria is very subjective and
18 open. The NRC solved that problem by issuing Generic
19 Letter 8610 Supplement 1 in the mid '90s as part of
20 the outfall of Thermo-Lag and it's interesting that
21 the testing bodies, the people who do this for a
22 living, ASTM, in '95, they issued their first
23 standard. So I think what you're seeing on this is
24 when you standardize the test method and then you go
25 back and look at these things, then you start to

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1 really see what happens.

2 Testing was performed on Hemyc in Spain.
3 There were some small scale tests. Dan knows a lot
4 about them. He can add to it. But that's what the
5 original approvals were based on. Anything you want
6 to add, Dan?

7 MR. FRUMKIN: Yes. Just that the testing
8 in Spain was similar, large furnace, 10 feet by six
9 feet kind of scale of furnace with the standard
10 temperature in a typical configuration. But we were
11 unaware or at least probably the analysts or the
12 reviewers in the early '80s weren't considering
13 thermal mass. They weren't considering different
14 kinds of configurations and so forth in their
15 analysis. So their review and this was reviewed in
16 the early '80s by the NRC Staff didn't take into
17 consideration a lot of the different factors that we
18 learned from Thermo-Lag.

19 CHAIRMAN WALLIS: It was a shrinkage
20 phenomena or something that you think would be
21 discovered in these earlier tests.

22 MR. FRUMKIN: It was a smaller scale test.
23 So the shrinkage is per foot. But one of the points
24 on the smaller scale test is like on building
25 materials if they have a ten feet of this conduit we

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1 put thermal couples every six inches. They put
2 thermal couples at one location on the ten feet. So
3 if the shrinkage did not occur if they didn't put it
4 at a seam, they might not have noticed a temperature
5 rise. We got smarter. But the -- Okay.

6 MR. SALLEY: Dan is absolutely right.
7 Standard E-119 test, you would use as few as ten
8 thermal couples. When you look at the tests we run
9 here, we use hundreds of thermal couples because we're
10 measuring so far along.

11 The structural steel, again to touch on
12 your question, Graham. The vendor manual had two
13 methods of installing the material. You could either
14 put the two sections together and put a collar over
15 it. That piece you see passing around, this is an
16 actual collar, a six inch collar. Or you could do an
17 overlap joint if you picture a bell and spigot in old
18 case iron plumbing. So when we say we tested what
19 industry did if they followed the vendor manual, here
20 are the two joints. We tested both types of joints.

21 The third thing you could do that we saw
22 from a lot of the installations in the field was
23 people had stitched it together, if you picture a
24 baseball stitched together. So we did the junction
25 box in that manner where we stitched the junction box

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1 tight like a baseball and that one gave us some real
2 problems in the first testing because --

3 CHAIRMAN WALLIS: They should supply them
4 with zips or something.

5 MR. SALLEY: Yes, zippers would have been
6 good. They hand-stitched it with a noncombustible
7 thread. The shrinkage really caught us off guard with
8 the junction box because when the shrinkage occurred,
9 now we had the seams open and when the seam is open,
10 the thread broke. When the thread broke, the fire
11 barrier fell off. So that was clearly the weakest
12 link was the stitched design.

13 Structural steel. It's good that we
14 tested it separate. Again, if the physics hold up
15 here, we can see the Unistrut. It conducted heat in
16 at the three inch point at 22 to 32 minutes on average
17 and the larger tube steel again, you have a larger
18 cross section to heat up. So it conducts heat better.
19 It failed as early as 13 minutes.

20 So this shrinkage was something new to us.
21 We did not expect to see this. It messed up our nice
22 test program that we had everything all laid out on
23 quite truthfully. So we had Sandia do a little extra
24 testing on that for us which we'll touch on here in a
25 minute. But there really is a phenomena where the

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1 material shrinks.

2 The first test was conduits and junction
3 box. The second test, we had three tests in total,
4 was on cable trays. So here we had two cable trays,
5 a 12 inch and a 36. We tested these empty because
6 just of the economy of it, the space inside to test
7 that. We also put in some air gaps.

8 The junction box bothered us from the
9 first test. So we had a little bit of room left in
10 this test that we installed a junction box. We
11 installed it the same way but this time we added the
12 stainless steel bands that we had also seen in
13 industry to try to keep it together.

14 What we saw was in the cable trays that we
15 had failures between 18 and 35 minutes again here on
16 temperature. The junction box with the banding, the
17 banding did help keep the barrier system on the box
18 this time. It did not fall off but we still exceeded
19 the temperature at 31 minutes and the air drop lasted
20 approximately 32 minutes.

21 Again, when you introduce this joint
22 failure, it's a random failure in the test. So what
23 you think is going to happen and what you want to say
24 was going to happen if that joint opens up because of
25 the different design that's skews your results.

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1 CHAIRMAN WALLIS: So it failed in about
2 half the time. It was supposed to last an hour. It
3 lasted a half an hour.

4 MR. SALLEY: Yes. If you just had to
5 throw a number up here.

6 CHAIRMAN WALLIS: It sounds like a big
7 change. It's a big loss of properties for that to
8 happen.

9 MEMBER DENNING: When you say loss of
10 properties, you're going to see what's going to happen
11 is it just separates.

12 CHAIRMAN WALLIS: It just opens up. So
13 the effect of conductivity or whatever it is really
14 drops or it's lost completely.

15 MEMBER DENNING: Right. The conductivity
16 of the Kaowool is well known. There's no problem with
17 that.

18 MR. SALLEY: Richard is exactly right.
19 There's a slide in the back you can look at and you
20 want to say from engineering background this is just
21 Fourier's Law.

22 CHAIRMAN WALLIS: So it's a heat leak
23 really. He's created a heat leak.

24 MR. SALLEY: Right. And we can solve this
25 in the uniform properties and do the calculation and

1 this should all be good. But when you get that joint
2 movement and opening here that's what gets you. Again
3 we saw the same thing as we saw in the first test.

4 The third test was conducted in April.
5 This was for the three hour assembly. Again we
6 followed the same format. We're looking at an array
7 of conduits, one inch, two and a half and four inch.
8 We have them empty and loaded again. We're trying to
9 follow that standardized format, junction box and an
10 air drop. As I understand it, there's not much or any
11 really of three hour barriers on cable trays in the
12 industry. So our test here was strictly on the
13 conduits. Again we had the two steel.

14 You can that again we're looking for three
15 hours here and our failures are occurring on the
16 conduits between 87 and 113 minutes. So again we're
17 hitting that halfway, Graham, like you were saying.
18 The junction box is 122. The cable air drops 159
19 minutes. Structural steel was roughly good for an
20 hour the way it was protected here. It was protected
21 a little further out.

22 Again we saw the same seal shrinkage. I
23 guess we could test this 100 times and 100 times we
24 would see the shrinkage. So we're pretty confident
25 with that. We saw that in every test. This test had

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1 18 inches for the structural steel support versus the
2 three and the one hour design and you could see that
3 that comes up a little bit short also.

4 CHAIRMAN WALLIS: Now does it shrinks
5 because of temperature?

6 MR. SALLEY: Yes.

7 CHAIRMAN WALLIS: You would think that the
8 inside would shrink almost immediately because it's
9 hot and the outside would shrink later.

10 MR. SALLEY: The outside of it is close to
11 the flux from the furnace. So that would be the first
12 thing heated up.

13 CHAIRMAN WALLIS: That's the outside
14 that's hot.

15 MEMBER DENNING: It's the fabric that's
16 shrinking.

17 CHAIRMAN WALLIS: That would shrink almost
18 immediately, wouldn't it, because it's the hottest
19 part? It's the outside.

20 MEMBER-AT-LARGE SIEBER: The outside.
21 Right.

22 MR. SALLEY: Right.

23 MEMBER DENNING: But you understand it's
24 fabric.

25 CHAIRMAN WALLIS: It's the fabric that's

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1 shrinks but the fabric is on the outside. You presume
2 the outside is the hottest. So I would expect it to
3 happen almost immediately on the outside and then
4 later on progress to the rest of it.

5 MR. SALLEY: The inside. Yes.

6 CHAIRMAN WALLIS: But something would
7 happen almost immediately, wouldn't it?

8 MEMBER-AT-LARGE SIEBER: On the outside.

9 MR. SALLEY: Immediately is a little too
10 quick is what the Sandia test will tell us.

11 CHAIRMAN WALLIS: Yes. It is on the
12 outside that's the hottest part.

13 MR. SALLEY: Yes. Again we saw the same
14 shrinkage. Let's flip to that Sandia slide next, Dan.
15 Sandia had done some small scale test and we saw this
16 in the first test. We wanted to understand more about
17 this welding cloth. And they had done some small
18 scale radiant flux tests.

19 A couple of interesting points here. Kind
20 of the history of it. You will hear the term sill
21 temp used a lot and we use the term Siltemp if you
22 read how we started this out. Like I said, Siltemp
23 was if you think of Kleenex. You don't say give me a
24 paper tissue. I want a Kleenex. It's a brand name.
25 Siltemp was the big brand that was used.

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1 When we did the testing we wanted to make
2 the assemblies as representative as possible. So
3 let's use all of the same things that industry did and
4 the vendor had actually allowed a couple different
5 manufacturers. So we went out in search of Siltemp.
6 Lo and behold, Siltemp is manufactured I believe in
7 Delaware and the company that manufactured Siltemp two
8 years ago when the hurricane came up this way actually
9 hit that company and took them out of business.

10 So the Siltemp manufacturer, we could not
11 buy Siltemp brand welding cloth. So we used another
12 brand that was Refroseal (PH) and we thought wait a
13 minute. Maybe we got a bad material here or this
14 different material made a change. So we had gotten
15 some New Old Stock Siltemp from the '80s from one of
16 the licensees and we had the material that we used in
17 the test. These were sent off to Sandia, put in an
18 radiant panel test and what we were looking for was is
19 the shrinkage measurable.

20 So given the two samples side by side with
21 the radiant flux on it, how did they react?
22 Basically, what Sandia told us is around 800°
23 Fahrenheit is when this phenomena wants to start
24 taking place and for all intent and purposes how they
25 measured it, the shrinkage was uniform. We were

1 comfortable that our tests were representative of what
2 was actually installed.

3 Shrinkage again was on the order of five
4 to ten percent. They did a nice simple test where
5 they cut scale pieces, laid them side by side, had
6 them scaled up, photographed it as it ran.

7 CHAIRMAN WALLIS: I presume it shrinks in
8 both directions.

9 MR. SALLEY: Yes. There's a whole science
10 of fabric which I know very little about and you can
11 get into whether they're cross-weaved and that.

12 CHAIRMAN WALLIS: So it depends on how the
13 weave is related to the way it's cut and everything.

14 MR. SALLEY: Right. The shrinkage was
15 fairly uniform. For our purposes, we felt comfortable
16 here and we were done.

17 Industry. Again, we put these results
18 out. We had a meeting in April where we shared all
19 this information and we shared all our test reports
20 with all our stakeholders mainly. They needed to
21 confirm that what research did is the facts of the
22 matter and that's good. So they ran a second test or
23 actually took one of ours that was left over and put
24 their barriers on.

25 This was run in August of this past year.

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1 It was basically a user group from industry. They had
2 some of the original materials from 1980s. So they
3 could back in their power storage warehouse, procure
4 the material out and run the test. They also had done
5 some minimal upgrades that some of the plants had done
6 in their site-specific installations which they
7 included in the test. We thought it would come down
8 to instead of using a six inch collar like the vendor
9 manual some utilities used an eight inch collar. Some
10 use as much as a 12 inch collar.

11 The minimum overlap for the bell and
12 spigot joint was two inches. Some plants in their
13 site-specific may have gone three or four. So they
14 were trying to test some of those upgrades. We used
15 half inch stainless steel banding. Some plants used
16 a larger banding. So a lot of this was included to
17 get the feel for this in their testing. Again, they
18 ran their testing and the results basically were
19 similar. You saw the shrinkage. All the barriers
20 failed before their minimum one hour rating and the
21 problem is there.

22 So in summary, we've completed our three
23 tests. The reports have been publicly available since
24 April. We've handed it over to NRR. We're continuing
25 to support. If there's any more testing from the

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1 industry, we'll be happy to witness it. That's I
2 guess in summary why we test, the importance of
3 actually doing the testing is what we found here.

4 I would like to go and show you quickly
5 before I run out of time a couple photos here that
6 hopefully will bring this all together. This first
7 photo is what the Hemyc looks like before the testing.

8 CHAIRMAN WALLIS: If you have a big enough
9 collar, then the shrinkage wouldn't matter. I mean it
10 would shrink but it wouldn't open up a gap.

11 MEMBER-AT-LARGE SIEBER: But layers on it.

12 CHAIRMAN WALLIS: If you have a big enough
13 collar, it shrinks. The other one shrinks but there's
14 still integrity.

15 MR. SALLEY: Right. You know an
16 interesting thing about this, Graham. It's funny like
17 I said. The more you work on it the more you learn.
18 But this material if you had done welding cloth for a
19 living is when you talk to the people who do this for
20 a living in their mind, this is old knowledge. We
21 make a preshrunk version. That was news to me. All
22 the welding cloth I've ever used over the years has
23 always been the tan material. I didn't realize you
24 could get a preshrunk and the way they preshrink it is
25 they heat it. We said "Wow. That's kind of like a

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1 eureka here." But when we talked with the vendors and
2 said why didn't you use the preshrunk version, the
3 answer was it's a lot harder to work because in the
4 heating of it apparently it stiffens it and it makes
5 it much harder to sew, much harder to do and that's
6 why we went with the other material.

7 MEMBER-AT-LARGE SIEBER: Pretty good stuff
8 if there isn't a fire.

9 MR. SALLEY: Yes, it's noncombustible. I
10 can say that in its favor. There's an actual piece
11 that came out of the test that it's clearly
12 noncombustible. Take a look at this photo real quick
13 and I'm going to turn around and point a couple of
14 things out to you. You can see a collar installed
15 there. Of course, the two pieces butt up and the six
16 inch collars is three inches on either side. The
17 junction box is in the background there.

18 You'll notice between the collar and the
19 junction box you can see one of the bell and spigot
20 joints there with the two inch overlap. Again notice
21 the color. It's tan. The furnace, we're looking
22 through the door of the furnace before it's buttoned
23 up for the test.

24 This one is the assembly just completely
25 one hour, our first test, just completely one hour.

1 It's now being craned off of the top of the furnace.
2 It's getting ready to be trolleyed over for the hose
3 stream test. Probably the most dramatic thing about
4 this one is if you look in the center you'll see our
5 junction box and the barrier is laying on the floor of
6 the furnace and you can see the junction is quite
7 warm. It's actually cherry red there on the inside.
8 So that was the worst of our failures.

9 If you look at the next slide, here is
10 what you see on one of the collar joints and because
11 of the shrinkage, and I say the randomness of the
12 shrinkage, is the bands are installed by hand and the
13 craftworkers say that's tight and you have to have at
14 least a half inch indented is the spec to make sure
15 that it is tight. So there is a randomness. It's not
16 like we have torque fasteners.

17 What you would see is that when the
18 shrinkage started occurring in the main pieces of the
19 Hemyc the collar would want to slide to one side or
20 the other. They wouldn't slide uniformly. They would
21 slide to one side or the other.

22 CHAIRMAN WALLIS: If the collar was big
23 enough, it wouldn't come out.

24 MR. SALLEY: Hopefully one would think
25 that. Like I said, there are some different

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1 variations. It's interesting but I remember looking
2 at the vendor manual and Roy and I were when we saw
3 this did we do it right and we started self-checking
4 quite feverishly. And going through the vendor
5 manual, yes, six inches was what was used. However,
6 there were notes that I believe Gonet had a special
7 note in the vendor manual which was odd to me that
8 said we use 12 inch collars. So maybe that plant had
9 a little different design. But this was a typical
10 failure.

11 Again here's another view of looking at
12 it. You can see the raceway where it's clearly
13 exposed and once you expose the raceway it's
14 instrumented. The thermal couples pick that up in a
15 matter of minutes.

16 MEMBER APOSTOLAKIS: Does this imply that
17 the cables inside also would fail?

18 MR. SALLEY: Yes. When you look at the
19 temperatures when the furnace is 1,000° at ten
20 minutes, 1,700° at one hour when you look at the final
21 temperatures here from the testing, it was common to
22 see them over 1,000° which we know thermoplastic,
23 thermoset, would have clearly failed.

24 MEMBER APOSTOLAKIS: Thank you.

25 MR. SALLEY: Again here's another view of

1 the collar. This next one here is a cable tray and
2 this one is quite interesting. Cable tray, take a
3 look at it. The cable tray again had a two inch
4 overlap. So this isn't rocket science. You measure
5 your blanket out so you can wrap the tray with at
6 least two inches. You sew the blanket up. It's very
7 labor intensive and you bring the mat or blanket out
8 and you wrap it around the tray. You pull the bands
9 and you've installed the barrier.

10 When you bring this thermal shrinkage in
11 as the material starts to constrict and shrink, you
12 can see that it opened the whole side of the cable
13 tray up. So the whole internal of that cable tray was
14 open to the furnace and like I said, if you go back
15 and look at the bare number rates and our surrogate
16 cables as we call them for instrumentation, the
17 temperatures are all over 1,000.

18 So there's some more summary material that
19 I've put there if you would like to look at later.
20 You see the randomness of the failures and some other
21 background but I've used more than my time. If there
22 are no questions, I'll turn this over to Angela.

23 MEMBER DENNING: Questions? Okay.
24 Please.

25 (Discussion off microphone.)

1 MS. LAVRETTA: Thank you. I'm Angie
2 Lavretta. As was said, I'm with the Fire Protection
3 branch, Division of Risk Assessment and I'll
4 presenting the final draft generic letter on the
5 Hemyc/MT fire barriers. As far as an overview of the
6 presentation, it will include a little bit of the
7 history, current status, the generic letter contents,
8 public comments and comment resolution and also a
9 little on the CRGR review and we'll touch on the risk
10 assessment and conclusion.

11 As Mark mentioned, the fire barrier issue
12 was first raised in the 1980s with Thermo-Lag.
13 Generic Letter 9208 was issued which called for the
14 reassessment of other fire barriers types at that time
15 and in the same timeframe, NEI had formed a fire
16 barrier advisory committee that had concluded that the
17 concerns raised for Thermo-Lag did not apply to Hemyc.

18 An action plan was developed by the Staff
19 to resolve the Thermo-Lag issues and in 1999, upgraded
20 fire protection program inspections were implemented.
21 And also in '99, it was these inspections that began
22 raising NRC concern about Hemyc performance. In
23 response to those concerns, the Staff initiated the
24 confirmatory test that you heard discussed by Mark.

25 The recent background is that these tests

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1 revealed a previously unidentified failure mode. We
2 issued an information notice highlighting this finding
3 in April. Two public petitions were filed calling for
4 prompt NRC action based on the results of these tests.
5 So we needed to plant-specific assessments and drafted
6 the generic letter and published it for comment in
7 July.

8 CHAIRMAN WALLIS: I'm curious about
9 whether the public petitions have anything to do with
10 this. Did you only act because the public petitioned?

11 MS. LAVRETTA: No. We started this action
12 with the information notice. But the petitions were
13 significant.

14 CHAIRMAN WALLIS: Just gave you added
15 stimulus.

16 MS. LAVRETTA: It added a lot of attention
17 to this issue. The public meeting was held
18 immediately after the public comment period on
19 September 29th and the industry took the opportunity
20 to ask questions and to expand on comments that they
21 had provided. The two main areas of comment were
22 focused on the interpretation of the Hemyc test
23 results and a risk informed alternative especially for
24 those plants applying 805. And the staff was able to
25 provide additional guidance and details. The comments

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1 were incorporated into the final draft.

2 Mr. Neal covered this in his introduction.

3 CHAIRMAN WALLIS: Now you get to my
4 question. Do you think that your tests enabled them
5 to tell whether they're in compliance? Suppose they
6 have longer collars or bigger overlap or blankets or
7 something. Do they say we're now in compliance
8 because ten percent shrinkage won't cause a problem?
9 Is that what they're going to do?

10 MS. LAVRETTA: Actually they did run their
11 own tests and I was able to observe with Roy and they
12 did use larger sized collars and it did result in some
13 lessening of the shrinkage but the temperature effects
14 were the same.

15 CHAIRMAN WALLIS: The same?

16 MS. LAVRETTA: It was consistent with the
17 results that we came --

18 CHAIRMAN WALLIS: But presumably the tube
19 didn't pull out of the collar, but the effects were
20 still the same.

21 MS. LAVRETTA: The temperature effects
22 were in the same ballpark.

23 CHAIRMAN WALLIS: It's hard to figure out
24 why.

25 MR. SALLEY: I think that two points on

1 that. If the system remained intact and it didn't
2 experience the shrinkage phenomena that we came up
3 with, I think you would still fall short. We had
4 expected to fall short and we expected to fall short
5 with a gradient. That's why we tested a four inch
6 loaded with 100 lbs. per linear foot of copper. We
7 thought that four inch would clearly pass. So we were
8 looking for where does the failure point occur and I
9 think you would come up short with the material that
10 way.

11 The second thing that I did on that,
12 Graham, was I called a bunch of residents and I said
13 give me some pictures of what's out in the plants and
14 let me sure that what we got is realistic. When
15 you're building these assemblies in a test lab, life
16 is pretty good. I mean you have to space things out
17 real nice because you don't want furnace shadow during
18 the testing and you have a lot of room to work.

19 What you see in the field looks very
20 different than what we tested because they had to work
21 around obstructions and piping and heavy four inch
22 tube steel supports. So I guess there could be some
23 unique configurations. We ran into that in Thermo-Lag
24 where all the vendor stuff was a single cable tray.

25 But when I looked TVA for example and what

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1 was actually installed the guys got creative. If they
2 needed to protect three trays, they could wrap three
3 trays individually or you could just build one big
4 box. And that same creativity, I think, ran over into
5 Hemyc and you'll see a lot of that same creative
6 installations that are out there.

7 CHAIRMAN WALLIS: But there could be some
8 guidance that says that for so many feet of this stuff
9 you must have an overlap of so much or something.
10 There's nothing like that though, is there? They have
11 to figure that out themselves.

12 MR. SALLEY: They have to figure that out.

13 MS. LAVRETTA: And they've said that they
14 are -- I don't know what the intent is but it was
15 discussed at the public meeting that some of these
16 licensees would be doing additional testing because of
17 the wide range of configurations they have and that
18 they may be using that as a basis for some other
19 conclusion.

20 MEMBER DENNING: It certainly is not the
21 responsibility of the NRC's confirmatory testing
22 program to provide all the answers. It's merely to
23 identify that there's an issue in my opinion.

24 MR. WOODS: Could I add a comment? This
25 is Roy Woods. Angie and I were the ones that went and

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1 saw the industry test. I've spent about a week
2 looking at the industry's data and what it shows is
3 although the joints didn't open as obviously as our
4 test because they had more overlap and whatever as you
5 look at the data you see that the joints were in fact
6 opening to a certain extent and you tended to see the
7 higher temperatures near joints. In fact, one of them
8 actually opened a small amount.

9 The added overlaps and whatever did help
10 but it certainly didn't fix the problem and the
11 shrinkage was about the same. The actual physical
12 percentage shrinkage was about the same. You just had
13 more overlap and more margin but it still didn't save
14 you.

15 MS. LAVRETTA: On Slide 8, this is the
16 generic letter purpose which again is to request that
17 addressees identify whether Hemyc and MT is relied on
18 for separation and/or safe shutdown; to request that
19 effected licensees provide a description of their
20 installation; a discussion of whether the installation
21 is in compliance in light of the new information;
22 description of the comp measures; and the corrective
23 action schedule and require a written response in
24 accordance with 50.54(f).

25 The generic letter request are

1 specifically that first within 60 days you provide the
2 following: a statement on whether Hemyc or MT fire
3 barrier material is used at their plant and whether
4 it's relied on for separation and/or safe shutdown in
5 accordance with 50.48 or other regulatory commitments
6 including whether the Hemyc or MT is credited in other
7 analyses and a description of the programmatic
8 controls in place to ensure that other fire barrier
9 types will be assessed for potential degradation in
10 light of new information.

11 CHAIRMAN WALLIS: Now that's a very broad
12 question, isn't it? Even if they're not using Hemyc,
13 they're using all kinds of other stuff. Now they have
14 to figure out if it could degrade.

15 MS. LAVRETTA: Well, we had issued --

16 CHAIRMAN WALLIS: You haven't given them
17 information about that. They may use something which
18 you've never tested.

19 MS. LAVRETTA: We had issued Generic
20 Letter 9208 which did not specifically request a
21 response to the question but stated that the Staff
22 expectation was that the licensees would reassess
23 their other fire barrier types.

24 CHAIRMAN WALLIS: Goes beyond Hemyc. It
25 goes to all barrier types.

1 MS. LAVRETTA: And that's what this
2 expectation relied in 9208 as well. So this is more
3 or less consistent with the expectation then but
4 because this new information has come to light and
5 apparently wasn't found then, we've asked for a
6 response to what they have in place.

7 CHAIRMAN WALLIS: So which is the next one
8 we're going to hear about? We've heard about Thermo-
9 Lag, Kaowool and Hemyc. What's next on the list? Are
10 there lots of different kinds out there?

11 MS. LAVRETTA: From my understanding,
12 Thermo-Lag was the widely used brand. Kaowool and
13 Hemyc have been identified. We're not likely -- I
14 don't know if there are any others.

15 CHAIRMAN WALLIS: They must use something
16 else now. Right?

17 MR. SALLEY: There's a variety obviously
18 out there. Thermo-Lag had 80 percent of the
19 population and that was because of its better ability
20 for capacity. So it had the lion's share and it
21 clearly was the bigger ones. Kaowool/Hemyc, 3M had
22 barrier systems.

23 Now 3M has done a lot of work with their
24 Interam. They read that last sentence in Generic
25 Letter 9208 and I believe there was some activities

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1 with plants that had used the 3M. There was also
2 stuff from France, Mecatiss, that had come in if you
3 remember during the Thermo-Lag era and I believe that
4 was tested and reviewed by the Staff and it was
5 installed in a number of plants.

6 MR. FRUMKIN: And other material, Darmat,
7 but Darmat and Mecatiss and for the most part as far
8 as we know Interam have all been tested in 8610
9 Supplement 1 methodology with the E-119 criteria. For
10 what is remaining, there is high confidence.

11 But to clarify something Mark said, we may
12 have reviewed the tests for Mecatiss, Interam, Darmat.
13 We don't approve them specifically because we're not
14 going in and verifying that every configuration is
15 exactly like what was tested. So just to clarify
16 that. Something could always happen. But there is a
17 much higher confidence that the licensees have
18 followed all the guidance for the currently installed
19 materials.

20 MS. LAVRETTA: And we're relying on the
21 updated inspection program to identify this which it
22 has done for Hemyc.

23 Slide 10, the second request that within
24 60 days effected licensees address the following:
25 whether or not Hemyc and/or MT is degraded in light of

1 the new findings.

2 CHAIRMAN WALLIS: What does that mean? It
3 hasn't been heated up 842°, has it? So how is it
4 degraded? If it's still yellow, it's still bad, isn't
5 it, degraded or not?

6 MS. LAVRETTA: The potential based on the
7 configuration testing is that it's degraded if they
8 have a different configuration from what's tested.

9 CHAIRMAN WALLIS: So it's the
10 configuration that's degraded.

11 MEMBER DENNING: Yes, those words are
12 funny but I think they are virtually out of the --
13 Those are the words that I think are used. This is a
14 pretty good reproduction of the words that are
15 actually in there by what it really means by degraded
16 which I think obviously from your comments means that
17 it is incapable --

18 MS. LAVRETTA: Of performing its intended
19 use.

20 MEMBER DENNING: Presumably incapable of
21 performing its intended use. Whereas as you read it,
22 it sounds like it sat through and over the years it's
23 been there. In some sense it got degraded. That's
24 the way you read that unfortunately.

25 MR. SALLEY: Another way of thinking of

1 that is the fire resistance is indeterminate I think
2 would give you a different flavor.

3 MR. FRUMKIN: And just to give you an
4 example of a hypothetical licensee that could read
5 this and say we are fine. If they have a license
6 condition or a license commitment that says the Hemyc
7 is only required to last for ten minutes, if that's
8 what they committed to, they could look at our tests
9 and see that all of our tests lasted ten minutes and
10 have high confidence and answer this question and say
11 ten minutes is good enough. We're not degraded.

12 MR. WEERAKKODY: In fact then, don't we
13 have one of the Indian Point plants that are using it
14 for 30 minute?

15 MR. FRUMKIN: Right. So their 30 minutes
16 is in the middle ground. But we're not concluding
17 from our testing that plants are degraded. That's up
18 to the licensee.

19 CHAIRMAN WALLIS: Thirty minutes is a
20 little dangerous it seems to me if it's going to
21 shrink when it gets hot and if the fire is close
22 enough, it's going to shrink pretty darn quickly. I'm
23 not sure there's anything magic about 30 minutes.

24 MR. FRUMKIN: It's degradation with regard
25 to their licensing basis. Are they in noncompliance?

1 So the material's never going to last an hour based on
2 our testing.

3 CHAIRMAN WALLIS: But you see what I mean.
4 The Kaowool's fine. The insulation properties are
5 fine.

6 MR. FRUMKIN: Right.

7 CHAIRMAN WALLIS: But the shrinkage could
8 happen it seems to me very early in the event if the
9 outside gets hot enough quick enough.

10 MR. FRUMKIN: The results of the testing
11 is that we didn't exceed this temperature of 325°.

12 CHAIRMAN WALLIS: Presumably if I took a
13 torch and laid it on this stuff, it would shrink
14 immediately, wouldn't it?

15 MR. FRUMKIN: It has to get up to a
16 certain temperature.

17 CHAIRMAN WALLIS: That's Right. But it
18 does do it quickly.

19 MR. FRUMKIN: And then if you see on the
20 pillow, the outside would shrink very quickly but the
21 inside has a lot of insulation. And if you have
22 overlap, it could take awhile.

23 CHAIRMAN WALLIS: Yes.

24 MR. FRUMKIN: It turn into a trapezoid and
25 then that leading edge would begin to shrink. So if

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1 you look at all the testing outside of the supports
2 and the junction box, it lasted a good 20 some
3 minutes.

4 CHAIRMAN WALLIS: You don't know how much
5 time. It seems to me the testing ought to lead to
6 design requirements and some sort of a specification
7 that overlap should be so much or something so that
8 they know when they're in compliance and when they're
9 not. Maybe that's industry's job.

10 MEMBER DENNING: Yes. I think the test is
11 really defined and the industry's responsibility is to
12 demonstrate that they can meet the test requirements.

13 CHAIRMAN WALLIS: But it should lead to
14 some design specs or guidance or something rather than
15 just figure it out for each thing yourselves somehow.
16 Maybe that's something that industry should be doing.

17 MR. WEERAKKODY: Yes. In fact, Dr.
18 Wallis, the purpose of the initial testing is to just
19 find out how to do the modifications.

20 MS. LAVRETTA: Also within 60 days,
21 effected licenses are requested to provide
22 justification for no corrective actions, a detailed
23 description of the Hemyc/MT installation, a detailed
24 description of their comp measures and corrective
25 actions implementation schedule including the intended

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1 licensing actions or exemptions.

2 Thirdly, after implementing corrective
3 actions but not later than December 1, 2007, they are
4 requested to provide confirmation of compliance via
5 corrective actions and a summary of the evaluation
6 used for their safety assessment.

7 MEMBER APOSTOLAKIS: But I'm just curious
8 how you come up with these dates. Why not October
9 1st?

10 MS. LAVRETTA: Oh, October 1st. We wanted
11 to give them a full two years allowing them the outage
12 time to implement these corrective actions while
13 they're down. We figured two years would be
14 sufficient and we expected the issuance in December of
15 this year.

16 MEMBER APOSTOLAKIS: But also it seems to
17 me in the back of your mind to have the probability or
18 the frequency of occurrence of fires that would
19 require.

20 MEMBER DENNING: And they're going to get
21 to that because they have done risk assessment which
22 indicates you don't have to run off and immediately do
23 it. But you're right, George.

24 MS. LAVRETTA: Also we have compensatory
25 measures in place. We've been working with the

1 industry since the findings of this test in April and
2 have done a case by case dialogue and interaction to
3 ensure that they have compensatory measures in place
4 now.

5 Slide 12. We received public comments --

6 MEMBER APOSTOLAKIS: I'm just curious
7 though. What is the mean time between fires of this
8 size? It has to be much longer than this. Right?

9 MR. FRUMKIN: Right.

10 MEMBER APOSTOLAKIS: It has to be much
11 longer than two years.

12 MEMBER-AT-LARGE SIEBER: One every 40
13 years.

14 MR. FRUMKIN: We did a safety assessment
15 and that used that kind of information with the
16 frequency of certain fires. We considered only a few
17 types of fires like a large piece of switch gear or an
18 oil fire that could create a 1,700° temperature for an
19 hour or something like that and based on our analysis
20 to get that temperature to shrink the Hemyc would be
21 a very rare occurrence.

22 MS. LAVRETTA: The originators of the
23 public comments were PCI Promatec who is the current
24 vendor, Progress Energy, NEI, Duke, STARS, the
25 Strategic Team and Resource Sharing, and

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1 Exelon/AmerGen. We received a total of 29 comments.

2 We divided the comments into eight
3 categories which are listed here. First was the
4 comment on the back fit determination. This comment
5 was also reiterated by CRGR and I'll go into this into
6 more detail on the slide.

7 The comment on schedule which stems from
8 comments relating to the licensee burden, in essence
9 the plants that had 18 month cycles and a large amount
10 of Hemyc expressed some concern for meeting this
11 schedule and our response to them was that we would
12 consider those unique situations on a case by case
13 basis.

14 The comments on risk informing, questions
15 asking on the application of 805 and whether we would
16 seek prior NRC approval before they would apply and of
17 course we said that we would not. This was something
18 that we would only expect prior approval of those
19 plants that did not incorporate 805.

20 Comments on Generic Letter 8610 Supplement
21 1, Miscellaneous -

22 CHAIRMAN WALLIS: One of the significant
23 ones there was that the ROC seemed to be using generic
24 communications to impose regulatory requirements.
25 This is something that I think is taken up in a report

1 by the Inspector General. There's a concern about
2 that in another context that generic letters are not
3 really supposed to impose regulatory requirements.

4 MS. LAVRETTA: I can go on. I'll discuss
5 this in the next slide.

6 CHAIRMAN WALLIS: I just wondered. Does
7 that seem to -- It just struck me as being possibly an
8 important issue.

9 MS. LAVRETTA: I'll discuss that in the
10 next slide. There were comments also on the details,
11 the wording and references which we incorporated and
12 we did not receive comments on the burden estimate and
13 you'll note that the numbers that you see on the right
14 column fell into more than one category so that the
15 sum is not equal to the total number of comments.

16 We met with CRGR last week, November 29th,
17 for their review and the two main comments or
18 questions revolved around the issues of back fit
19 determination which Dr. Wallis was just referring to
20 and the change in the estimate of the impact on the
21 industry. On the back fit determination, the proposed
22 generic letter referred to the information request as
23 a compliance back fit and the comment we received from
24 CRGR was that an information request was not a back
25 fit. We addressed this by removing the incorrect

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1 references to back fit.

2 The CRGR also was concerned with the
3 application of 8610 Supplement 1 that the Staff
4 expectation of this application may be a back fit.
5 Because we did not provide a clear distinction in the
6 generic letter between the acceptance criteria and
7 NFPA-251 or ASTM-E 119 and the clarification guidance
8 in Generic Letter 8610 Supplement 1, the Committee
9 recommended adding this distinction. So in response,
10 we clarified the use of NFPA-251 as the acceptance
11 criteria and the use of 8610 Supplement 1 as guidance
12 for the detail of the thermal couple placement and
13 number.

14 The second issue was the change in the
15 estimate of the impact because we had prepared a
16 simplified value impact analysis following the public
17 release of the draft or estimate change. But the
18 change was minor and the conservatism large. So no
19 revision was needed.

20 A simplified risk analysis was done with
21 the assumptions listed here based on the results of
22 the test that you heard described earlier by research
23 including a sensitivity case. Conservatism was
24 captured consistent with the fire protection SDP and
25 configurations assumed were those estimated by the

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1 staff to be typical and the determination was that we
2 did not expect any high risk situation.

3 MEMBER DENNING: Let me ask you a few
4 questions about that so we can understand. Typically
5 in these applications, they are done where there is
6 fixed fire suppression and detection available. Is
7 that a true statement?

8 MR. FRUMKIN: Yes. Because a one hour
9 barrier requires suppression.

10 MEMBER DENNING: Right. So now if you had
11 a fire, even an oil fire, if you actually had the
12 suppression system working would it prevent the
13 damage? Is there a full protection really provided by
14 the suppression system itself?

15 MR. FRUMKIN: We don't give -- The fire
16 protection SDP never gives 100 percent effectiveness
17 for a suppression system.

18 MEMBER DENNING: But the expectation is
19 that at least you would wet the cables and so that
20 even if it doesn't put the fire out that you're
21 providing substantial cooling.

22 MR. FRUMKIN: Right.

23 MEMBER DENNING: I'm trying to determine
24 what's reality versus what's --

25 MR. FRUMKIN: Personally if there's a

1 suppression system going off in a room and we need to
2 reach 800° to get shrinkage in this cable, it's going
3 to be unlikely that we're going to get that kind of
4 temperature certainly with the water system because
5 you'll get a lot of steam in the air and with a
6 gaseous system, gaseous systems are very effective on
7 flammable liquid fires. So if there's a system in the
8 room, it's very comfortable there's going to be
9 extinguishment or protection.

10 MEMBER DENNING: In the risk analysis, was
11 there credit taken for the fire protection system and
12 then one gets a low risk because of the unavailability
13 of the fire protection system? Did you understand my
14 question?

15 MR. FRUMKIN: Yes. Credit was given for
16 fire protection systems and it was reduced, full
17 credit was reduced, by the unavailability and it was
18 given, the maximum unavailability of a gaseous system
19 is only 95 percent available, five percent
20 unavailable. So even though there may have been
21 sprinklers which are 98 percent available, we went and
22 backed off and used the higher unavailability.

23 MEMBER DENNING: Thank you.

24 MS. LAVRETTA: And finally the generic
25 letter issuance will ensure compliance with fire

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1 protection requirements. For plant specific issues,
2 allow the Staff to determine the need for flexibility
3 on a case by case basis and assure timely comp
4 measures and corrective actions are put in place.

5 MEMBER DENNING: Good. Do the Committee
6 members have questions?

7 MR. WEERAKKODY: Dr. Denning, this is
8 Sunil Weerakkody. I have a couple of remarks.

9 MEMBER DENNING: Certainly.

10 MR. WEERAKKODY: I know Dr. Wallis
11 mentioned these couple of very important questions.
12 I want to make sure that we fully answered them. One
13 was issuance of the generic letter. We received the
14 results from the tests in March of 2005. Within a
15 week, we should definitely know this, and right after
16 that, the Senior Management pretty much concluded that
17 we are going to issue an generic letter. The fact
18 that one of the conditions as I recall pretty much
19 asked us to write a generic letter. It was a
20 coincidence. So it was on our part we understood that
21 it is an important issue to reestablish compliance.

22 There was a high level question with
23 respect to are we using the generic letter process.
24 Generic letters to enforce burdens really clearly are
25 not and in fact when we ask for your approval to issue

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1 this generic letter we have done everything we can to
2 basically use the generic letter appropriately,
3 meaning we are basically telling the plants that these
4 are the results we found. We believe that there could
5 be -- for noncompliances. You guys tell us whether
6 you are or you are not and if you are not, what you
7 need to come back to compliance. So I just wanted to
8 emphasize that when I ask for permission to issue a
9 letter, we are not imposing an undue burden. We are
10 using appropriate use of 5051(f) in the generic
11 letter.

12 I would just want to share one thing to
13 the Committee and this is somewhat not relevant to
14 this topic, but I know you have a meeting with the
15 Commissioners, and I did mention this to Dr.
16 Apostolakis and Dr. Bonaca. With respect to the 805
17 reg guide, we are planning to come back to you as we
18 had. There could be a couple of weeks here and there.
19 But to date we have received five plans to adopt the
20 805. And Dr. Apostolakis -- I just wanted to share
21 that with you.

22 MEMBER DENNING: Let me ask a speculative
23 question and that relates to NFPA-805 and an issue of
24 this type. Obviously, you've given some evidence and
25 I've seen a paper that I think that Greg Gallucci put

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1 together that indicated the magnitude of associated
2 risk and indications are that risk isn't very high.
3 That's not surprising. There's no question in my mind
4 however that the deterministic safe shutdown
5 requirements that we have are an important element of
6 fire safety in nuclear power plants.

7 As you look at NFPA-805, what would be the
8 response of an NFPA-805 plant versus a plant that has
9 these deterministic requirements? Would you expect
10 that an NFPA-805 plant produce an argument that said
11 the risk is small? We don't really have to address
12 this problem. Is that the direction that we're
13 headed?

14 MR. WEERAKKODY: Dr. Denning, let me
15 answer that in two ways. When we had the public
16 meeting on Hemyc, two nuclear entities showed
17 personally. One was Progress Energy and one was Duke
18 Energy. These are the two plants that -- 805. I did
19 mention that one nuclear entity that is now testing to
20 find the appropriate fix and that's Progress Energy
21 because Harris Power Plant has a lot of Hemyc. So
22 people aren't jumping and saying their number is low.
23 Therefore, I'm not going to do anything. It's more
24 what Harris will be able to do if their Hemyc -- We
25 expect them to do some fixes in the risk critical

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1 areas but then there may be other areas where the
2 defense in depth is met, safety -- is met where they
3 may not.

4 MEMBER APOSTOLAKIS: I'm a little bit
5 confused now. What does it mean to follow an NFPA-
6 805? Don't you still have requirements related to
7 defense in depth?

8 MR. WEERAKKODY: Yes.

9 MEMBER APOSTOLAKIS: You do. And this is
10 really a defense in depth.

11 MR. WEERAKKODY: Yes. So you couldn't
12 crunch a number and then -- The rule doesn't allow
13 that and the 805 plants are not planning to do that.

14 MEMBER DENNING: Now you know when we
15 talked about the proposed rule related to separation
16 it was recognized that one way that plants could get
17 out of the situation that they're currently in where
18 they have not had approved exemptions is to make
19 arguments through an NFPA-805 that would allow manual
20 actions to take the place of these things. Is it your
21 feeling that that's just a different form a defense in
22 depth?

23 The thing that concerns me a little bit is
24 the definition of defense in depth and the flexibility
25 that people have in the interpretation. I rather

1 suspect that the direction is that in a case like this
2 an argument would be made that we still have defense
3 in depth. We have the fire suppression system for
4 example. We really don't have to assure the fire
5 barrier is intact for the one hour period. That would
6 be my guess.

7 MEMBER APOSTOLAKIS: It's conceivable that
8 in some location that might be valid given the whole
9 context of risk.

10 MEMBER DENNING: Well, given the whole
11 context of risk, you're right and I think that there
12 are relaxations and I think that it is the dilemma
13 that we're in of how much do we believe the risk
14 assessment, how much faith do we place in the
15 deterministic criteria and are we eroding safety when
16 we accept those risk arguments or are we just putting
17 our efforts in more effectively?

18 MEMBER APOSTOLAKIS: It's an integrated
19 decision-making process. So presumably these issues
20 will be raised there.

21 CHAIRMAN WALLIS: I have a question about
22 this risk. You said you do not expect any high risk
23 situation. You didn't show us the analysis and the
24 components of the risk and I was wondering if the risk
25 was low because fires that reach this temperature or

1 in the area where this stuff is are unlikely or it is
2 because the Hemyc provides sufficient protection for
3 long enough even when there is a fire. What's the
4 answer?

5 MR. FRUMKIN: The answer to that is both.
6 I'll just give you some numbers. This isn't a
7 publicly-available document. I'm just go from here.
8 We assume 25 pieces of switch gear are in a room or we
9 assume that there's six pumps that are considered. So
10 we are assuming that there are rooms with a lot of
11 combustibles and we come up with fairly high
12 frequencies, 3⁻³ kind of frequencies.

13 CHAIRMAN WALLIS: For a fire?

14 MR. FRUMKIN: For a fire. Then we also
15 credit, I believe, and this is Ray's analysis, the
16 capability for the Hemyc for as long as it was capable
17 of giving protection. So if it was good for five or
18 ten or at least I think 16 minutes in all cases, we
19 credited that and we give the fire brigade credit for
20 the probability that they'll come and suppress in that
21 time or the suppression system, the probability that
22 it will suppress. And if you look at the analysis,
23 it's based on the frequency, that's a good piece of
24 it. The effectiveness of the suppression system is a
25 piece of it.

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1 CHAIRMAN WALLIS: The Hemyc lasting some
2 of the time is a piece of it.

3 MR. FRUMKIN: Yes. Well, the Hemyc
4 lasting some of the time is a factor in the
5 probability of nonsuppression.

6 CHAIRMAN WALLIS: Because from the
7 simplistic view, if I showed the pictures you showed
8 me to, I don't know who, my wife or students or
9 something, they would say, "Look this stuff doesn't
10 work. It has to be fixed." That would be the
11 reaction I would think. It's supposed to be a fire
12 barrier but it doesn't hold up. So I think the risk
13 thing looks good but from the perception of the
14 pictures you showed us, it doesn't look a very good
15 fire barrier.

16 MR. FRUMKIN: Right. But again, if from
17 a risk standpoint to get the fire brigade in there to
18 put out the fire you only need a half hour, then this
19 material at a half hour might look a lot better. If,
20 for example, you had Thermo-Lag that you needed to
21 last for an hour and a half, it would look really bad
22 at an hour and a half. So we have the flexibility of
23 going in and looking at some temperature numbers and
24 some performance numbers and seeing that this material
25 at maybe less than hour would give a really high

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1 confidence that the suppression system would actuate
2 or the fire brigade would be successful or that some
3 other manual actions would have a chance to disable
4 some serious actuations that could occur. So there's
5 a balance with the frequency, again with the
6 capability of even a degraded system in our analysis.

7 MR. WEERAKKODY: Dr. Wallis, we could, if
8 the Committee is interested, make available to you a
9 presentation that Dr. Gallucci made on this subject at
10 a ANS conference.

11 MEMBER DENNING: We actually have a copy
12 of that but actually I think that it is important
13 input to us and we can review it. But I don't see a
14 need for us unless somebody wants to. We can look at
15 that paper. I think it's fairly obvious what the
16 reasons are why risk analysis would show that the risk
17 isn't very high. It doesn't mean that the changes
18 don't have to be made but it does give us some
19 confidence that we don't have to say shut all the
20 plants down until it's done. Any other comments or
21 questions?

22 VICE CHAIRMAN SHACK: I just had a
23 question on the history. You said that the NRC
24 inspections about Hemyc raised the concern and then
25 you ran the tests.

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1 MEMBER DENNING: How were they so smart?

2 VICE CHAIRMAN SHACK: Yes.

3 MEMBER DENNING: We'll give you an answer.
4 You can give the answer.

5 MR. SALLEY: I can answer that a number of
6 ways. Obviously with Thermo-Lag, the whole fire
7 barrier issue came into light. One of the things the
8 inspectors do if this was a perfect system, we would
9 have a number of components that would put it
10 together. We would have the vendor manual and I would
11 be able to take the vendor manual and go and look at
12 the qualification tests and every piece that was in
13 that vendor manual I would be able to tie back to the
14 testing and say here's why six inches is good. Here's
15 a four inch conduit with it and I could tie every
16 piece back. This is why this works. This is why this
17 works.

18 A lot of what the inspectors will do is
19 when I talked about that creativeness that was
20 actually in the installation. So you may have had a
21 good material. You may have had a good vendor manual.
22 But if the licensee wrapped three cable trays rather
23 than one, then it's fair game for the inspector to say
24 wait a minute. The largest thing you ever wrapped was
25 a 36 x 4 inch tray and I got out in the plant and I

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1 see this four foot by three foot. That's clearly
2 beyond what your testing was and bring it up that way.
3 So the inspectors will do a lot of that. That's how
4 this really got started.

5 MEMBER DENNING: I think there was a very
6 specific event though that occurred and I'm not going
7 to be able to reproduce it exactly in which an
8 inspector went in and looked at the tag on it and the
9 tag said what it had been qualified for and the tag
10 disclaimed that it was applicable to nuclear if I'm
11 properly reflecting it. But in stuff that I read
12 here, it was obvious to the inspector that the tag was
13 disclaiming applicability.

14 MR. QUALLS: Can I answer that question?

15 MEMBER DENNING: If you do, you have to
16 come to the microphone over here and state your name.

17 MR. QUALLS: Hi. My name is Phil Qualls.
18 I was actually on both inspections where the issue was
19 originally raised. I was one of the inspectors
20 involved with this issue. The Region II fire
21 protection inspector had serious questions about the
22 test. It was one of the things Jerry Harris at the
23 original inspection where the issue was raised because
24 he had noted that the oven, in his words, "was a very
25 small test." It did not even compare with the testing

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1 that we would have used in ASTM E-199. So he had
2 questions about the test.

3 We went on the inspection. He didn't know
4 if the material was actually any good. We went on the
5 inspection. We got copies from Region II as part of
6 the inspection procedure and started looking at the
7 test during inspection. The test during inspection
8 raised enough questions that they sent it to us via a
9 task interface agreement so that some of the licensed
10 fire protection engineers here in Headquarters could
11 look at the test.

12 During the test, we noted that a very
13 limited number of configurations were tested. If you
14 recall, the regulation requires a rated one hour or
15 three hour barrier. In the original Generic Letter
16 8610, we defined a lot of criteria for what we meant
17 by a rated barrier. Inclusive of those were
18 configurations that were bounded by an existing fire
19 test. Now this is the original 1986 version not
20 Supplement 1.

21 What we found on a subsequent inspection
22 at a licensee when we looked at the test in the
23 office, we noted that a very limited number of
24 configurations had been tested, for example. Dan's
25 more familiar with that. He did that part of the

1 review. For example, a four inch conduit was the only
2 conduit tested. On a subsequent inspection we noted
3 that many conduits smaller than four inches were
4 tested.

5 MR. FRUMKIN: Or installed.

6 MR. QUALLS: It was installed but not
7 tested. Smaller conduits are not bounded. It didn't
8 meet the criteria that would have satisfied a rated
9 barrier per Generic Letter 8610. That's why we
10 started -- That's the inspection question. So that's
11 the history of the inspection questions. I won't go
12 into any more detail than that.

13 MEMBER DENNING: Okay. Thank you. Does
14 the Committee have -- Do you have something you want
15 to say?

16 MR. SCOTT: Yes. Mike Scott, ACRS Staff.
17 Can we go back to Slide 9 please? I got a little
18 confused on the message here, your last bullet, a
19 description of programmatic controls in place to
20 ensure other fire barrier types will be assessed. Now
21 I understand that one of them, Mark, was that the
22 Staff has high confidence that the other fire barrier
23 types out there are good and I'm wondering how that
24 matches up against this bullet.

25 MS. LAVRETTA: I'm not sure that we said

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1 that we have a high confidence.

2 MR. SCOTT: Maybe I misunderstood.

3 MS. LAVRETTA: We're confident that if
4 there are any that have not been identified it's a
5 very low likelihood. But because this issue was
6 raised on Hemyc and apparently slipped between the
7 cracks in response to the 9208 expectation that other
8 fire barrier types be reassessed, we just wanted to
9 make sure that we were aware of what controls they had
10 in place in order to prevent any more gaps in what our
11 expectations are.

12 MR. WEERAKKODY: Yeah. We have high
13 confidence but I think we are striving for even higher
14 confidence because right after these results came out,
15 the Commission, the stakeholders, actually asked the
16 same question you asked which is what else is out
17 there. So really what we are trying to do here is
18 getting the licensees to give us that emphasis.

19 MR. SCOTT: Thank you.

20 MEMBER DENNING: Thank you. Mr. Marion,
21 would you like to make a comment or ask a question?

22 MR. MARION: Alex Marion, NEI. Thank you.
23 I wasn't prepared to make any remarks but I feel
24 compelled to offer a little clarification. This goes
25 back to Dr. Wallis's point about using generic

1 communications to impose new regulatory positions.
2 That in fact was done in Generic Letter 8610
3 Supplement 1 and let me just explain that. The NRC at
4 that time identified new acceptance criteria for fire
5 barrier testing and new methodology for conducting
6 fire barrier testing. Prior to that, the acceptance
7 criteria focused on demonstrating cable functionality.

8 Now there is nothing wrong with the NRC
9 changing a regulatory position but it shouldn't be
10 done in a generic communication. It should be done in
11 a more disciplined rulemaking process. Secondly, this
12 second bullet on Slide 9 represents the implementation
13 of Generic Letter 8610 acceptance criteria to other
14 fire barrier systems. In effect, it's a new
15 regulatory position and another example where generic
16 communication is being used to impose a new regulatory
17 requirement. Thank you.

18 MEMBER DENNING: Thank you. I think that
19 we are now done and I turn it back to you, Mr.
20 Chairman.

21 CHAIRMAN WALLIS: Thank you very much and
22 I thank the speakers. We are going to take lunch. We
23 have a meeting with the Commission at 1:00 p.m. We
24 all have to be there. Now would you like to meet here
25 and go down there? I suggest that we either meet here

1 10 minutes ahead of time or those who don't want to
2 meet here be already down there.

3 MEMBER-AT-LARGE SIEBER: I think we can
4 find our way.

5 CHAIRMAN WALLIS: Most of you know the
6 way. Okay. So we will now take this recess and we
7 will meet in the -- Do we need the transcript for this
8 afternoon?

9 VICE CHAIRMAN SHACK: Yes. The ANPR.

10 CHAIRMAN WALLIS: We have another event.
11 So after 3:00 p.m., we'll need a transcript in here.
12 Thank you. Off the record.

13 (Whereupon, at 11:55 a.m., the above-
14 entitled matter recessed to reconvene at 3:34 p.m. the
15 same day after a meeting with the NRC Commission.)
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1 A-F-T-E-R-N-O-O-N S-E-S-S-I-O-N

2 3:34 p.m.

3 CHAIRMAN WALLIS: On the record. We're
4 going to continue the Proposed Program Plan and
5 Advanced Notice of Proposed Rulemaking for Risk-
6 Informing 10 CFR Part 50. My colleague and neighbor
7 here, Bill Shack, I think is going to lead us through
8 this one. Bill.

9 VICE CHAIRMAN SHACK: We've discussed
10 risk-informing specific regulation such as 50.46.
11 We've also had some interesting, more general
12 discussions of risk-informing regulations such as tech
13 neutral framework, single failure criterion and our
14 favorite of course is the Commission's expectations
15 for enhanced safety in new reactors. The Commission
16 has directed the Staff to develop an advanced notice
17 of proposed rulemaking to get public comment on
18 approaches to making essentially risk-informing 10 CFR
19 50.

20 In the version that we got, there were two
21 parallel paths proposed. One was developing an
22 entirely new Part 53. The other one was to continue
23 to risk inform by revising the regulations one at a
24 time. There was a new version that was delivered last
25 night where the parallels disappeared. The emphasis

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1 was on developing a new Part 53 with the recognition
2 that we would continue to work on specific regulations
3 like 50.46 and 50.61 and the Staff will tell us a
4 little bit more about their plans for the ANPR and the
5 plans for developing a new Part 53. Mary, I guess
6 you're going to make the presentation.

7 MS. DROUIN: Thank you. My name is Mary
8 Drouin from the Office of Research. At the table with
9 me is Joe Birmingham and Donnie Harrison from the NRR.
10 But before I get started, Charlie Ader, my Division
11 Director, would like to make some opening remarks.

12 MR. ADER: Actually I was going to thank
13 the Committee for the opportunity to provide the
14 informational briefing to you. We're not requesting
15 a letter at this time due to the expeditious schedule
16 we are on to meet the Commission's expectation for an
17 ANPR due to some recent SRMs.

18 That paper is due and Mary will go through
19 the details to the EDO tomorrow. But we are looking
20 forward to continued dialogue with the Committee from
21 the Commission meeting this afternoon. There is,
22 obviously a number of key policy issues that will
23 require a lot of discussion as we move forward in
24 time. So we'll be welcoming that opportunity. And
25 with that, I will turn it back over to Mary.

1 MR. SNODDERLY: Excuse me. May I before
2 you begin? Charlie, could you please clarify? In the
3 proposed SECY that's about to go up, does the Staff
4 still recommend that the Commission approve issuance
5 of the ANPR?

6 MR. ADER: Why don't I let Mary? That's
7 in the presentation.

8 MR. SNODDERLY: Okay.

9 MR. ADER: The answer is yes but why don't
10 I let her go through the details of the change. The
11 change from what you have and what's going up are
12 really more format, content and substantive changes.
13 But we can go through that.

14 MR. SNODDERLY: And the reason I brought
15 that up is because I think I would like to point out
16 to the Committee that I think the Commission will be
17 interested in whether the Committee feels that the
18 ANPR should go forward or should be amended. Thanks.

19 MS. DROUIN: The purpose of today's
20 briefing as you know is to brief you on the SECY paper
21 that we are sending forward and as you'll see later
22 on, this paper is due to the EDO tomorrow. We're on
23 a very tight schedule with the SRMs that came out and
24 I'm going to get to those in a minute. We had a very
25 short timeframe to pull together this plan and the

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1 ANPR and write this SECY paper.

2 MEMBER DENNING: I think that third bullet
3 is very understandable considering our last letter.

4 MS. DROUIN: I wasn't going to comment on
5 that, but we also as part of this did want to in this
6 packet inform the Committee how we are addressing the
7 ACRS letter that was in response to SECY 130 on the
8 two issues of level of safety and integrated risk and
9 as Charlie noted, at this point in time we are not
10 requesting a letter from the Committee.

11 MEMBER POWERS: Good. The Committee might
12 not survive another letter on this section.

13 MS. DROUIN: You were given a draft SECY
14 paper back on November 18th and in that SECY paper,
15 you had two attachments. You had a program plan and
16 you had an ANPR. As Charlie noted, it's really a
17 formatting packaging difference that you see. The
18 ANPR what we've done is we have taken the program plan
19 and incorporated it directly into the ANPR.

20 So when you looked at your package, you'll
21 see that there was the task to develop the new Part 53
22 that's now there's a section in the ANPR that's now
23 called "Plan." So all of that has been moved into the
24 Plan. It's been streamlined down but the essence of
25 it is still there to develop the new Part 53, do the

1 technical basis, then go on to rulemaking and it does
2 note that we still plan to continue on with risk
3 informing the current Part 50.

4 How did we get here? There are for very
5 relevant SRMs that for background we need to go
6 through because they are the foundation and the
7 formulation of this SECY paper and the ANPR. Back in
8 April of this year, RES briefed the Commission on its
9 research plans and programs, etc. and then on May 9th,
10 the Commission came back in SRM and asked the Staff to
11 develop, and you'll see the exact words there, "a
12 formal program plan to make a risk-informed
13 performance based revision to 10 CFR 50. We had a lot
14 of discussion among the Staff of what did those
15 directions of that SRM mean. We had several PRA
16 steering committees and we formulated a plan to move
17 forward and to develop the plan with ANPR.

18 During this same timeframe, three other
19 SECY papers had gone forward and they're all related.
20 The next one that came out was SECY 120 which talked
21 about security. There was a relevant piece in there
22 because it brought back into the technology neutral
23 framework which said that we were going to develop
24 security performance standards as part of the
25 framework and the SRM on this one approved the Staff's

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1 recommendation to the Commission.

2 Also in the summer, we had the famous SECY
3 130 that went forward on the two policy issues of
4 level of safety and integrated risk. The Commission
5 came back in their SRM and did not approve the Staff
6 recommendation and asked the Staff to consider the
7 Committee's views and to come back with a subsequent
8 notation paper.

9 They also asked us to develop in
10 expedition fashion an ANPR and incorporate into the
11 ANPR the formal program plan and also to integrate
12 security, safety and emergency preparedness as part of
13 this effort. So you will see that's in ANPR. We have
14 actually attached that to it and Joe will get into
15 that later in the presentation. We've asked for
16 comments on it and it's a actual part of the ANPR.

17 Also this past summer, another SECY paper
18 went forward which was 138 which talked about how to
19 revise the single failure criterion and there were
20 recommendations. There was to release it to the
21 public. Also should we consider maybe moving it into
22 this new Part 53 and the Commission as you can see
23 came back and said put this as part of the ANPR. Put
24 it as part of the program plan, etc. which is what we
25 have done. So you also see in the ANPR a whole list

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1 of questions associated with this effort.

2 VICE CHAIRMAN SHACK: Now Part 53 is still
3 intended to be voluntary though and you will continue
4 to have a choice.

5 MS. DROUIN: Right now, we're
6 characterizing it as an alternative. Ultimately that
7 will have to be a policy decision for the Commission
8 whether they want it to be voluntary or mandatory.
9 But right now, we keep characterizing it as an
10 alternative.

11 So as you see from these four SRMs that
12 came out, there are four programs that have been
13 impacted by these SRMS, the program for the regulatory
14 structure new plant licensing which is where the
15 technology neutral framework effort has been ongoing;
16 the work on security design expectations is being
17 impacted. Coherence was impacted by this in an
18 indirect way. In the past, we had an SRM directly us
19 to develop a plan for coherence. We did a draft plan.
20 We circulated it around the Staff and the position and
21 recommendation that we can came back to the Commission
22 that it made more sense to incorporate this as part of
23 this new Part 53. So it has brought that into it.
24 And then also it's impacting the program that came out
25 of SECY 98.300 which is risk informing the various

1 regulations and the current Part 50. We've tried to
2 pull these efforts together into this ANPR or our
3 proposal.

4 When you look at the plan that we have
5 proposed in answering these SRMs and looking at the
6 various ongoing programs that are impacted what we
7 proposing is to create this new alternative Part 50.
8 So this is a continuation and an advancement of the
9 technology neutral framework effort in essence.

10 We plan to integrate safety security and
11 emergency preparedness. I know when we've been here
12 before the Committee in the past we always had a
13 placeholder for security because we were waiting on
14 Commission direction which came out of SECY 120 which
15 did tell us to go forward and integrate it and develop
16 these performance. So now we'll start doing that.

17 We're going to address coherence, you've
18 probably see these famous words before, by ensuring
19 that the reactor regulations and staff processes and
20 programs are built on a unified safety concept and are
21 properly integrated so that they compliment one
22 another. We will be factoring that out into the
23 program.

24 MEMBER APOSTOLAKIS: Now the word
25 "coherence" refers to what? I mean Part 53 by its

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1 nature will be coherent, won't it?

2 MS. DROUIN: Yes.

3 MEMBER APOSTOLAKIS: So you're referring
4 to Part 50.

5 MS. DROUIN: That's the aim.

6 MEMBER APOSTOLAKIS: You are referring to
7 Part 50 then?

8 MS. DROUIN: We're referring to Part 53
9 here.

10 MEMBER APOSTOLAKIS: Because the earlier
11 effort was to achieve coherence in Part 50, wasn't it,
12 the existing regulations?

13 MR. BIRMINGHAM: When we were focused on
14 risk informing 10 CFR Part 50 on a regulation by
15 regulation individual basis.

16 MEMBER APOSTOLAKIS: Right.

17 MR. BIRMINGHAM: Yes, that's was our
18 intent. What we are considering here is seizing that
19 effort of risk informing 10 CFR Part 50 regulation by
20 regulation but focusing on 10 CFR Part 50 for this
21 purpose and we're not going to stop looking at 10 CFR
22 Part 50. But the majority of resources will be
23 focused on Part 53.

24 MEMBER APOSTOLAKIS: Right. But when it
25 says address coherence, you are referring to Part 50.

1 MR. HARRISON: Well, in this case, it's
2 Part 53. To make sure --

3 MEMBER APOSTOLAKIS: Fifty-three will be
4 coherent.

5 MR. HARRISON: By definition -- If you do
6 it correctly, you will. Right.

7 MEMBER APOSTOLAKIS: Yes. The problem is
8 the current regulations that are not coherent. Some
9 of them are from the old days. Other are more recent.
10 and so on. Part 53 you are starting with the
11 technology neutral framework which is self consistent.
12 Right? And you will go ahead with the regulatory
13 guides at some point. So you don't need to address
14 coherence. I mean it's inherent in the effort.

15 MS. DROUIN: I don't think it's
16 necessarily inherent in the effort because when you
17 create your alternative you certainly don't want it to
18 be, borrowing from that same word, incoherent with our
19 current regulatory structure.

20 MEMBER APOSTOLAKIS: But 53 will be.

21 MS. DROUIN: You could go off and you
22 could create this Part 53 that's over here that's
23 separate and independent but you want it to be
24 coherent.

25 MEMBER APOSTOLAKIS: That's what I'm

1 saying.

2 MS. DROUIN: With the current regulatory
3 structure.

4 MEMBER APOSTOLAKIS: I don't know what
5 that means.

6 MEMBER KRESS: I don't either because the
7 current regulatory certainly is incoherent. So how
8 can you be coherent with something that's incoherent?

9 MEMBER APOSTOLAKIS: Yes. That doesn't
10 make sense.

11 MR. BIRMINGHAM: A small part of the
12 answer is in the next bullet. It doesn't answer your
13 question fully but it helps.

14 MEMBER APOSTOLAKIS: But don't we agree
15 that Part 53 the way you guys are developing it has an
16 excellent chance to be coherent because you are
17 starting with the top structure and you're proceeding
18 down?

19 MS. DROUIN: Yes.

20 MEMBER APOSTOLAKIS: Now what you just
21 said is something that is kind of new to me that you
22 also wanted to be coherent with the existing Part 50
23 which as Tom says is itself incoherent. So you really
24 don't want to do that. Perhaps you mean that there
25 are certain principles in Part 50 that you want to

1 preserve and so on which I think is a very good idea.

2 MS. DROUIN: That's exactly what I mean.

3 MEMBER APOSTOLAKIS: But it's not --
4 Coherence means much more than that. So addressing
5 coherence, it's really what you were talking about
6 three or four years ago, Mary.

7 MS. DROUIN: I think that there are levels
8 of coherence that can achieve and I think when you
9 start with a new Part 53 and you look towards the
10 future.

11 MEMBER APOSTOLAKIS: Yes.

12 MS. DROUIN: And that's going to be your
13 future. Then you are going to be having coherence
14 down the road.

15 MEMBER APOSTOLAKIS: Right. And that's my
16 point.

17 MS. DROUIN: So in our mind, it makes
18 sense then to try and do it here under this new Part
19 53 than try and restructure, I'm not sure of the
20 correct word to use here, so that you have that
21 ultimate -- coherence on Part 50 which I don't think
22 is practical or very obtainable to do.

23 MEMBER APOSTOLAKIS: Part 50 will be very
24 hard to be made coherent. It will be very hard. So
25 when you say address coherence, I thought you were

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1 talking about that because the new Part 53, there may
2 be some inconsistencies here or there but by and
3 large, it will be coherent.

4 MS. DROUIN: Yes.

5 VICE CHAIRMAN SHACK: You're in violent
6 agreement.

7 MS. DROUIN: I think so.

8 MEMBER APOSTOLAKIS: Well, except when
9 Mary says that 53 will be coherent with 50.

10 MS. DROUIN: I think it's coherent with 50
11 when I'm sitting here saying there's a lot of stuff
12 from the past and lessons learned.

13 MEMBER APOSTOLAKIS: Yes.

14 MS. DROUIN: We certainly don't want to
15 abandon and we want to be --

16 MEMBER APOSTOLAKIS: I agree.

17 MEMBER KRESS: There are lots of things
18 that Part 50 had like one of my favorites is the
19 siting criteria. When you get around to Part 53 and
20 the new way of looking at it, you will have to somehow
21 incorporate that into Part 53 in a coherent way.

22 MS. DROUIN: Right.

23 MEMBER KRESS: Because they had reasons
24 for having those criteria.

25 MS. DROUIN: That's right and as you

1 transition --

2 MEMBER KRESS: So I can understand taking
3 things that the current Part 50 are addressing and
4 being sure you don't lose any.

5 MEMBER APOSTOLAKIS: That's right.

6 MEMBER KRESS: And if you're meaning that
7 as coherence.

8 MS. DROUIN: To me, that's coherence.

9 MEMBER KRESS: Okay. That I go along
10 with.

11 MEMBER APOSTOLAKIS: What is it that
12 you're seizing at this point? Additional rulemakings
13 will not be initiated. Additional to what?

14 MS. DROUIN: I haven't gotten to that
15 bullet yet.

16 MEMBER APOSTOLAKIS: Additional to 50.46?

17 MS. DROUIN: Right. So right now the plan
18 is to continue with the current ongoing efforts,
19 complete those and then if we initiate anything new
20 that will be decided down the road. But right now in
21 the short term, the plan is not to initiate new work.

22 MEMBER KRESS: Good.

23 MS. DROUIN: Thank you.

24 MR. ADER: Mary, if I can correct. I
25 think George asked beyond 50.46. There are a few

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1 others in the process, LOCA loop that's being looked
2 at.

3 PARTICIPANT: 50.61.

4 MR. ADER: PTS. So there are some other
5 ongoing ones and those are included.

6 MS. DROUIN: Sorry. Those are ongoing.

7 MR. ADER: So it's not that we're stopping
8 those also.

9 MS. DROUIN: Anything that's ongoing we
10 will complete.

11 Okay. Now we want to get into the actual
12 ANPR and at this point I'm going to turn it over to
13 Joe to take you through the ANPR.

14 MR. BIRMINGHAM: Good afternoon. I'm Joe
15 Birmingham in the Office of NRR. You've seen me
16 before but mostly in fire protection. What I'm going
17 to talk about is the ANPR and its contents, the
18 Staff's proposed approach for a risk-informed Part 53.
19 The Staff proposes to issue an advanced notice of
20 proposed rulemaking, to solicit comment on the
21 proposed approach and the Staff proposed that the ANPR
22 will remain open until a technical basis is complete
23 approximately in December 2007. This is to allow
24 comment on the technical basis development, issues
25 that arise during that time. Upon completion of the

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1 technical basis, the Staff will request Commission
2 direction and approval to initiate rulemaking.

3 CHAIRMAN WALLIS: Well, the technical
4 basis presumably has to itself be based on some
5 societal basis because the whole purpose of nuclear
6 safety is to do something for society. It's not a
7 purely technical exercise. So what are you going to
8 start with as your societal basis?

9 MS. DROUIN: Those are some of the issues
10 that we're going to be looking at. As it was raised
11 in your letter, we'll be looking at that. We're going
12 to solicit stakeholder input. So right now in terms
13 of how we're going to explicitly address it, it hasn't
14 been decided.

15 MEMBER KRESS: Remember you're free to
16 discount and disagree with stakeholder input.

17 MS. DROUIN: Really?

18 CHAIRMAN WALLIS: You'll have to because
19 it won't be consistent. It won't be coherent.

20 MR. BIRMINGHAM: That kind of lead into my
21 next bullet. The ANPR will help ensure that NRC's
22 intent to risk inform the reactor requirements is
23 known to all stakeholders. They have an opportunity
24 to comment and maybe point out means to improve our
25 approach. The ANPR will allow NRC to proceed in this

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1 effort in an open, integrated, transparent manner.
2 We'll be holding public meetings, workshops and things
3 like that.

4 CHAIRMAN WALLIS: By technical basis, do
5 you mean a set of specifications, methods, measures
6 and whatever from which everything else can be deduced
7 in a logical way? Is that what you mean?

8 MR. BIRMINGHAM: Essentially yes. Since
9 it's a risk-informed approach and performance-based
10 approach, we will be looking at coming up with these
11 technical performance standards to achieve without
12 specifying.

13 CHAIRMAN WALLIS: And you'll apply the
14 same ones universally across all the rules.

15 MR. BIRMINGHAM: Across all the reactor
16 designs and --

17 CHAIRMAN WALLIS: And they all will be
18 derived from the same route or trunk or something of
19 logically expressed bases and everything will flow
20 from rationally from the same.

21 MR. BIRMINGHAM: That will be the
22 challenge.

23 CHAIRMAN WALLIS: Okay.

24 MR. BIRMINGHAM: That would be the ending.
25 The ANPR will solicit stakeholder input throughout the

1 technical basis development period. As new issues are
2 identified or as technology-neutral framework is
3 completed, we will supplement the ANPR.

4 The NRC plans to develop an integrated
5 risk-informed performance-based revision to 10 CFR
6 Part 50. That will be one of the items that we spell
7 out in the ANPR. Some of the policy issues in the
8 ANPR will be the integration of safety, security and
9 emergency preparedness, level of safety and integrated
10 risk. The ACRS letter on these issues will be an
11 attachment to the ANPR to allow stakeholder comment on
12 the views raised by ACRS Committee members. The
13 contention functional performance requirements, the
14 definition of defense in depth and all that can be
15 part of the risk-informed Part 53.

16 MEMBER APOSTOLAKIS: Why isn't the
17 definition that the Commission has included in its
18 White Paper sufficient? What do we mean by
19 definition? I suspect what you mean is the second
20 part of your statement how do we incorporate defense
21 in depth in a risk-informed Part 53? Because the
22 definition is there, isn't it?

23 MR. BIRMINGHAM: If you look at some of
24 the new reactors, the definition of the defense in
25 depth, the traditional one where you would have

1 barriers in succession, defense in depth barriers,
2 will change somewhat. How important will a contention
3 be for a pebble bed modular reactor? Will it be a
4 case where the level of that barrier can be less
5 provided some other level is greater? We'll have to
6 look at how it affects these new technologies.

7 MEMBER APOSTOLAKIS: So it's how to use
8 the concept not to define it. The definition is
9 there.

10 MS. DROUIN: George, what you said was
11 correct. When you look at the White Paper, the White
12 Paper says the definition of defense in depth is the
13 philosophy, blah, blah.

14 MEMBER APOSTOLAKIS: Yes.

15 MS. DROUIN: And as a strict high-level
16 definition, yes. But now how you take that and
17 implement it to develop your new Part 53, your
18 requirements and everything, it needs more into that.

19 MEMBER APOSTOLAKIS: So it's really not
20 the definition. It's the use, the utilization of the
21 concept of defense in depth.

22 MS. DROUIN: Yes. Unfortunately, this was
23 how we defined it. If you go back to SECY 030047 when
24 we went to the Commission, we used the word definition
25 and it was probably the wrong word.

1 MEMBER APOSTOLAKIS: We can change it in
2 the future.

3 MS. DROUIN: Yes, we could.

4 CHAIRMAN WALLIS: I don't think saying you
5 have further criterion is a policy. It's a method.
6 It's an approach. It's not a policy at all.

7 MEMBER APOSTOLAKIS: Yes.

8 MEMBER KRESS: That's just a name for the
9 policy.

10 CHAIRMAN WALLIS: It's a way of achieving
11 something.

12 MEMBER KRESS: The policy is actually
13 should you continue using it.

14 VICE CHAIRMAN SHACK: I thought the policy
15 was whether you should have design basis accidents and
16 how you would define them.

17 CHAIRMAN WALLIS: Whether you should have
18 design requirements.

19 MEMBER KRESS: That ought to show up in
20 here somewhere.

21 CHAIRMAN WALLIS: Right. That's the sort
22 of thing.

23 MEMBER APOSTOLAKIS: In fact, why isn't
24 that part of the question what Bill just said? Do we
25 need the concept of design basis accidents in the new

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1 system?

2 CHAIRMAN WALLIS: Yes.

3 MEMBER APOSTOLAKIS: Is that a policy
4 issue or is that something else?

5 VICE CHAIRMAN SHACK: I think we're ahead
6 of ourselves on that.

7 MR. BIRMINGHAM: The ANPR is of course to
8 solicit wide stakeholder comment and we're not
9 narrowing it down to this is a done deal type thing.
10 Yes, we were --

11 MEMBER APOSTOLAKIS: I think it deserves
12 it's own green line there.

13 MS. DROUIN: It is its own green line in
14 the sense that we have the technology-neutral
15 framework there and associated with the technology-
16 neutral framework you will see coming out of that
17 should we have design basis accidents.

18 CHAIRMAN WALLIS: Right, and what purpose
19 do they have, do they fulfill, if you have them?

20 MEMBER APOSTOLAKIS: Well, that is an
21 answer but it's not even there.

22 CHAIRMAN WALLIS: But that's important.

23 MS. DROUIN: There's a whole slew of
24 questions --

25 CHAIRMAN WALLIS: It's much more important

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1 that single failure criterion.

2 MEMBER APOSTOLAKIS: Yes. I think Bill is
3 right. The single failure criterion is part of a
4 definition of design basis accident. That's a broader
5 concept.

6 MS. DROUIN: I understand that. What
7 we're trying to do here, I'll show you on this view
8 graph, was there were specific things coming out of
9 SRM that we were asked to put into that ANPR. So
10 there is that. We're also going to put with the ANPR
11 the next version of the framework in April and the
12 framework is going to have a whole slew of questions
13 and some of the things that you raised are going to be
14 the questions that will be added to ANPR.

15 MR. HARRISON: And just why I think we're
16 a little ahead of ourselves is when that comes out in
17 April would be the time we would ask those questions.
18 So that's why they're not on here as a green line is
19 because we're not issuing the technology-neutral
20 framework at this point in time. So those questions
21 haven't been -- That would be a supplement.

22 MEMBER APOSTOLAKIS: Isn't that NUREG
23 report out with the technology-neutral? What do you
24 mean you are not issuing?

25 MS. DROUIN: No, it's not out yet. The

1 last version that went out was this past January.

2 MEMBER APOSTOLAKIS: But it's public.

3 MS. DROUIN: A year ago.

4 MR. ADER: No, George. You're asking
5 about the single failure NUREG or the technology-
6 neutral.

7 MS. DROUIN: We issued on in January. We
8 had a workshop in March for three days and we got a
9 pile of comments that thick. We've been working on
10 those comments.

11 MEMBER APOSTOLAKIS: And then they will
12 reviewed.

13 MS. DROUIN: So this new revision that
14 we're going to put out --

15 MEMBER APOSTOLAKIS: Right. But the basic
16 structure, people are aware of.

17 MS. DROUIN: Yes.

18 MR. HARRISON: But the expectation is when
19 that goes out we'll supplement the ANPR with a list of
20 questions.

21 MEMBER APOSTOLAKIS: Let me -- I sense
22 that you guys are too defensive here. We're trying to
23 help.

24 MS. DROUIN: No, no. We're not being
25 defensive. We're trying to explain to you why.

1 MEMBER APOSTOLAKIS: I think the
2 recommendation to put DBAs there is very reasonable
3 and you're resisting it.

4 MS. DROUIN: I'm not resisting it.

5 MEMBER APOSTOLAKIS: Okay. I can't
6 imagine what you would do if you were to resist it.

7 MS. DROUIN: We're trying to explain
8 what's on this slide and why the things you're not
9 seeing why it's not here.

10 CHAIRMAN WALLIS: You are telling the
11 world you intend to develop a new set of regulations,
12 a fantastic undertaking. You have to tell the world
13 something about what you're thinking of putting in
14 there as a basis and what constituent parts it may
15 have such as DBAs or design requirements or some
16 general design criteria.

17 MS. DROUIN: Yes, I agree with you.

18 CHAIRMAN WALLIS: You're going to address
19 those key things on which everything else will be
20 built. Are you going to sketch that out for the world
21 before you put this thing out?

22 MS. DROUIN: All I'm trying to explain is
23 that we agree with you on all of those things and
24 maybe we did a disservice by not putting subbullets
25 under the technology-neutral framework.

1 MEMBER BONACA: But what we expected today
2 was to have a complete list of policy issues. Let's
3 give them credit. Let's say these are examples and I
4 can live with that.

5 MEMBER APOSTOLAKIS: We are making the
6 comment that DBAs is a broader issue than single
7 failure criteria. That's all.

8 MEMBER BONACA: Yes.

9 CHAIRMAN WALLIS: It's more than that,
10 George. It's we're trying to say what sort of things
11 should be in this sketchy -- You're proposing to do
12 something. You've written proposals. You have to say
13 my proposals is going to have certain things in it.
14 Otherwise, you have no idea what it is and you pick
15 out the most important things like DBAs and so on and
16 say we're doing to address those.

17 MEMBER BONACA: I'm only saying that why
18 do we have to presume that this is a complete list
19 now. This is communications to us and they're going
20 to have a listing.

21 MEMBER APOSTOLAKIS: We are not assuming
22 anything. We're just making comments trying to be
23 constructive and as usual, we are misunderstood.

24 MEMBER BONACA: I know.

25 VICE CHAIRMAN SHACK: Just want to do

1 good. Right, George?

2 MEMBER APOSTOLAKIS: We want to do good.

3 MR. BIRMINGHAM: I heard the phrase I'm
4 from the Government and I'm here to help you. But
5 thank you. I appreciate that.

6 CHAIRMAN WALLIS: No, we're from the
7 public and we're here to help the Government.

8 MEMBER APOSTOLAKIS: You can't win. So
9 keep going.

10 VICE CHAIRMAN SHACK: Let me just ask the
11 question. You said you were going to give this a
12 higher priority than continuing to risk inform Part
13 50. What has a higher priority, development of Part
14 53 or completion of the 50.46 and 50.61 for example?

15 MR. BIRMINGHAM: 10 CFR 50.46 for example
16 because it's already in the works and actually Eileen
17 perhaps could help.

18 MS. MCKENNA: This is Eileen McKenna,
19 Policymaking Branch NRR. I don't know as we've
20 prioritized them that way. We didn't run together the
21 current rules. We prioritized on an individual rule
22 basis. I think part of the point is that they're on
23 different schedule tracks. The ones we have now, the
24 50.46(a) and 50.61, we have proposed rule out on
25 50.46. We're into the rule-plan stage on 50.61.

1 This effort as I think was clear from
2 looking out, we're out a few years before we even
3 begin rulemaking. So they're priorities. They're
4 just on different tracks.

5 CHAIRMAN WALLIS: I think what we're
6 trying to get at is does it have enough horsepower
7 behind it to really go forward.

8 MS. MCKENNA: You may have noticed in the
9 draft we gave you we didn't put down resources and
10 that's because we were still working through what
11 resources we think are necessary and that is one of
12 the considerations because we are being pulled in many
13 different directions on supporting a lot of different
14 efforts and the Commission ultimately will have to
15 decide what priorities these different things have.

16 CHAIRMAN WALLIS: It sounds to me like a
17 major and significant initiative and if it's going to
18 go anywhere, it's going to have proper horsepower
19 behind it, right people, right backup and everything
20 else. Otherwise, you're going to be playing around
21 for years. If you're serious about coming up with
22 something real in a few years, it has to have all that
23 effort behind it.

24 MR. ADER: I think we agree with that and
25 what you see at this table is as this goes into ANPR

1 space, the technology-neutral framework had been a
2 research lead with participation, we had support as a
3 team from NRR and from NSER, is it's moving into ANPR
4 stage.

5 That gives it a higher imprint on it and
6 it puts more of starting to move it out of a
7 development stage into let's start the rulemaking.
8 Let's get these issues addressed. By that nature,
9 you're going to expand the senior staff and the
10 knowledgeable staff that will really be focusing and
11 getting it closer to how you would implement it. So
12 I think the emphasis is there and just by virtue of
13 where we are now, there's already a movement to devote
14 more resources and more staff to it.

15 MR. BIRMINGHAM: I think I was leaving off
16 at technology-neutral framework and that will be in
17 the ANPR but it's kind of an IOU because it's not
18 fully developed yet and will be issued later. At that
19 time, we supplement ANPR with an issuance.

20 CHAIRMAN WALLIS: What else could it be?
21 If this is going to be a way of licensing new reactor,
22 what else could it be other than technology-neutral it
23 seems to be. It has to be able to deal with anything
24 that comes along.

25 MR. BIRMINGHAM: I think we definitely

1 agree with that thought. It's the way that it will be
2 developed as a technology-neutral framework. How
3 should it be? There are thoughts on should it be high
4 temperature gas modular reactors. How far should we
5 consider and we're interested in those comments on
6 every one of those technologies.

7 CHAIRMAN WALLIS: If you're going to
8 identify the common features of all these technologies
9 which have an influence on safety, then you'd better
10 figure out how to deal with them.

11 MR. BIRMINGHAM: It's a challenge. Also
12 we're going to itemize that the NRC plans to continue
13 its ongoing efforts on risk-informing and performance-
14 based certain regulations in 10 CFR Part 50 which we
15 just covered.

16 We plan to provide updates to the
17 Commission first of all on feedback on stakeholder
18 comment on the ANPR. We plan to provide
19 recommendations from the comments and also on Staff
20 deliberation on policy issues, on level of safety and
21 integrated risk, the path forward on containment
22 functional performance standards and definition of
23 defense in depth, additional policy and technical
24 issues as identified, we expect that that will happen,
25 initiation of former rulemaking on a new Part 53,

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1 also our plan for formal rulemaking to revise any
2 other regulations in 10 CFR Part 50 as they are
3 identified.

4 CHAIRMAN WALLIS: Now when you have this
5 new Part 53 it's going to be a government document,
6 one similar like Part 50. Presumably you'll have some
7 kind of a preamble which explains what's in it and
8 why. It would be good if you would try to write that,
9 the considerations for the whole thing. Describe your
10 whole objective and how subsequent stuff fits into
11 this objective that you have.

12 MR. BIRMINGHAM: Yes, that would have to
13 be done.

14 MEMBER POWERS: It should have a statement
15 of consideration --

16 CHAIRMAN WALLIS: No, but it should be out
17 there somewhere.

18 MEMBER APOSTOLAKIS: But it's not part of
19 the --

20 CHAIRMAN WALLIS: But you often go back to
21 there.

22 MR. BIRMINGHAM: No.

23 MEMBER APOSTOLAKIS: You don't have a
24 statement. An objective?

25 MR. HARRISON: Well, you state an overall

1 purpose or objective. But as it was stated earlier,
2 that was to make a transparent process, seeks to
3 feedback on the issues as we go forward. So you're
4 not going to get one that talks about until you get
5 into rulemaking a statement of consideration that says
6 here's the ultimate purpose of having a risk-informed,
7 performance-based Part 53. That wouldn't occur until
8 you got into actual rulemaking space and wrote a
9 statement of considerations.

10 CHAIRMAN WALLIS: You wouldn't have an
11 ultimate purpose until you've delivered the
12 rulemaking.

13 MR. HARRISON: No. I'm saying that's
14 where you would state the framework for the rule
15 itself and where it came from and how you derived it.
16 At that point, you would also have to summarize all
17 the comments that you have received during the ANPR
18 period I believe and you'd have to say how you've
19 reconciled that.

20 CHAIRMAN WALLIS: I find this very
21 strange. The whole idea of a design process is to
22 address a problem or a situation that has been defined
23 by some customer and I'm not sure that this whole
24 specification for this new rule has been laid out.

25 MR. HARRISON: These policy issues are in

1 many ways specifications.

2 CHAIRMAN WALLIS: I think your job is to
3 set up those specifications. Right?

4 MS. DROUIN: That's what we'll be doing
5 over the next two years.

6 CHAIRMAN WALLIS: Yes.

7 MR. BIRMINGHAM: And longer.

8 MS. DROUIN: And longer.

9 CHAIRMAN WALLIS: It sounds great and
10 we're all trying to help.

11 MEMBER APOSTOLAKIS: Are you going to
12 update us too? Are we part of this?

13 MS. DROUIN: That goes to the next slide.

14 MR. BIRMINGHAM: A great lead into the
15 next slide. I'm going to turn this back over to Mary.
16 She's going to provide the next steps and a brief
17 summary.

18 MS. DROUIN: As I said, we owe the SECY
19 paper with the enclosed ANPR to the EDO tomorrow,
20 obtained all the concurrences at this point. So I
21 don't see any delay in meeting that date. We plan to
22 continue to engage the ACRS.

23 CHAIRMAN WALLIS: I think this is
24 interesting enough that it's going to be a high
25 priority item for us as long as you give us enough to

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1 work with.

2 MS. DROUIN: And we've already been having
3 discussions with Mike and Med on when we want to set
4 up our next subcommittee meeting and we look forward
5 to -- We'd asked for a full day for our next
6 subcommittee meeting because there are enough issues
7 and substance there to discuss. Throughout this whole
8 process, as Joe said, we're going to having public
9 meeting and workshops as we complete the development
10 of the technical basis. Right now, we've just
11 identified some things. So we thoroughly expect that
12 as we complete this there are going to be other issues
13 that are going to emerge out that we're going to want
14 stakeholder input.

15 MEMBER POWERS: Can I ask a question about
16 public meetings and workshops? Why are those
17 effective for us? I'm not sure exactly what you mean
18 by public meetings and workshops. But if I
19 characterize what I typically see is that workshop or
20 public meeting, either one, if declared we will have
21 one, Staff goes to some length to invite the parties
22 that they know to be interested in those particular
23 items and they're held at some hotel here in
24 Washington or maybe some other place but most often
25 here in Washington. Is that what you're thinking of

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1 there?

2 MS. DROUIN: I think there are two kinds
3 of meetings and workshops. I think you have some
4 meetings where you're just trying to communicate
5 here's where we're at and we aren't necessarily trying
6 to get feedback. It's us trying to present
7 information. Then you have the meetings where you
8 actually want a technical discussion back and forth.

9 I think that the workshop that we had last
10 March was an incredible success. We had three days of
11 very intense technical exchange between industry, I
12 say industry, I mean all the stakeholders because it
13 wasn't just industry that was there.

14 CHAIRMAN WALLIS: I would like to suggest
15 your role as a leadership role. Your job is to go out
16 there and sell what you're doing to people who are
17 interested in it not to just listen. You have to
18 listen too but I think you have to take a leadership
19 role on something that's as important as this and do
20 all the stuff and really get the critical feedback.
21 But you have to sell them that you're doing something
22 which is viable and worthwhile and all that. So it's
23 really a leadership role.

24 MEMBER POWERS: What I'm asking is it
25 seems to me that here you are. You're messing with

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1 Federal regulations for nuclear power plants. Why
2 isn't the appropriate forum for communicating with the
3 interested community things like the American Nuclear
4 Society meetings?

5 CHAIRMAN WALLIS: Yes.

6 MS. DROUIN: And I was going to continue
7 because I wanted to comment on your statement that we
8 go to pick selected people one that we announce these
9 things in a *Federal Register* notice for all people.

10 MEMBER POWERS: And I know so many of my
11 friends and neighbors just pour over the *Federal*
12 *Register* each day looking for the least opportunity
13 they can to come to Washington.

14 MS. DROUIN: Dana, we have also ongoing
15 discussions with ANS, all the different SDOs.

16 MEMBER POWERS: S-D-O?

17 MS. DROUIN: Standards Developing
18 Organizations, I'm sorry, with ANS --

19 MEMBER POWERS: Which is one of the
20 weakest organizations in ANS.

21 MS. DROUIN: IEEE. We do try and reach
22 out to the different professional societies. This is
23 a topic that I know a lot of the professional
24 societies have been interested in. We try and reach
25 out to the international community. We try and use

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1 all the mechanisms that are at our disposal to try and
2 get the information out to all the stakeholders.

3 MEMBER POWERS: I guess I'm still coming
4 back and why isn't the forum for discussion here the
5 American Nuclear Society? At least you get the
6 interested community going there anyway. Whereas a
7 special trip to Washington, I doubt seriously that
8 there are too many people that volunteer to do that.

9 MR. HARRISON: I think it's all valuable
10 input. If there's an ANS annual meeting and we can
11 coordinate to have this meeting.

12 MEMBER POWERS: Yes. There are two of
13 them a year.

14 MR. HARRISON: Right. And I think that
15 would be good.

16 MEMBER KRESS: ANS has these topical
17 meeting. I think this would be a fine issue.

18 MEMBER POWERS: The trouble is that you
19 have to schedule topical meetings, just to put them
20 together, three years in advance.

21 MEMBER KRESS: That's true.

22 MEMBER POWERS: Whereas to get something
23 in either one of the winter or the annual meeting of
24 the ANS is a much easier chore.

25 MEMBER APOSTOLAKIS: But it shouldn't be

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1 just a session. It should be something special.

2 MEMBER KRESS: Yes.

3 MEMBER POWERS: If you want something
4 special, it will cost you a year in advance.

5 MEMBER APOSTOLAKIS: Yes. So okay.

6 MR. HARRISON: Or schedule it the day
7 before like a premeeting.

8 MEMBER APOSTOLAKIS: Yes. Something like
9 that.

10 MS. DROUIN: We have tried to coordinate
11 some of these meetings like last year with the
12 workshop. We coordinated that at the same time as the
13 RIC conference because we knew a lot of the attendees
14 would be out here at the same time. So we do look for
15 those kinds of opportunities to do that.

16 CHAIRMAN WALLIS: I think another good
17 audience is rather really smart students.

18 MEMBER APOSTOLAKIS: Where can you find
19 those?

20 CHAIRMAN WALLIS: There are a lot more I
21 might suggest. But really if you're going back to
22 basics on nuclear safety and you're going to make a
23 framework which makes sense, you ought to be able to
24 explain it to engineering students who really --

25 MEMBER POWERS: I will just comment that

1 out of the mouth of babes often comes a lot of
2 nonsense.

3 MS. DROUIN: As I said -

4 CHAIRMAN WALLIS: We're used to that.
5 We're used to trying to explain things to students.
6 They often are very helpful. If you can't explain it,
7 then -

8 MS. DROUIN: I agree. We should be able
9 to explain this at least --

10 CHAIRMAN WALLIS: You should be able to
11 explain this to knowledgeable people who have open
12 minds.

13 MS. DROUIN: Yes.

14 MEMBER POWERS: Or empty minds.

15 MS. DROUIN: We do plan to supplement the
16 ANPR over time as needed. So this set of questions is
17 not the end-all. As new things and we want more
18 input, we will keep supplementing the ANPR as needed.
19 We intend to complete the technology-neutral
20 framework.

21 VICE CHAIRMAN SHACK: I forget which
22 version I'm looking at. That's not the only one.
23 There were 37 questions or something.

24 MS. DROUIN: Right. And those weren't all
25 the questions. That's not it. There will be more to

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1 come.

2 MEMBER APOSTOLAKIS: The problem I think,
3 a general comment here, with efforts of this type is
4 that the community at large is not really familiar
5 with regulatory processes. That's a fact. That's why
6 --

7 CHAIRMAN WALLIS: These are new ones.

8 MEMBER APOSTOLAKIS: What?

9 CHAIRMAN WALLIS: These are new regulatory
10 processes which are going to be more transparent.

11 MEMBER APOSTOLAKIS: But still I don't
12 think that the community, it's a unique culture.

13 CHAIRMAN WALLIS: That's the problem with
14 the present regulations. It requires the unique
15 culture to understand it. But the new ones are going
16 to be so transparent it's not going to be a problem.
17 Isn't that part of your objective?

18 MEMBER POWERS: Naive students. I'm being
19 led by naive professors.

20 CHAIRMAN WALLIS: You don't need to use
21 adjectives.

22 MEMBER POWERS: Pejorative adjectives to
23 boot.

24 MS. DROUIN: Once the technical basis is
25 complete as Joe noted, then the intent is to go back

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1 to the Commission and ask for approval to initiate the
2 formal rulemaking, developing the actual rulemaking
3 language.

4 VICE CHAIRMAN SHACK: Excuse me. Mary.
5 Before you leave the next steps, can we talk about in
6 your Attachment 3 that you sent down, there's a Table
7 2 on page 28 of the program plan, the table that gives
8 the milestones. I just want to make sure I understand
9 what the next steps are. As you said, December 9,
10 2005 you're going to go forward with this SECY paper
11 that has the enclosed ANPR and the questions and then
12 you're going to be asking for -- Then you say that in
13 March '06 assuming that the Commission approves
14 publication of the ANPR within 30 days you publish the
15 ANPR. Then you expect to come back in October of '06
16 with a SECY paper on stakeholder feedback from the
17 ANPR.

18 But down in the technical basis, you also
19 talk about issuing a draft of the technology-neutral
20 framework in March of '06. I guess do you anticipate
21 the Committee reviewing. When do you anticipate the
22 Committee reviewing the technology-neutral framework?

23 MS. DROUIN: Right now, our intent was to
24 take the next version because we've gotten all the
25 comments, we've been working on those, to put that in

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1 the ANPR actually in April not March, get some
2 feedback to get a sense of what the stakeholder
3 comments are and then come back to the ACRS because
4 the ACRS would be receiving it at the same time. This
5 would give the ACRS, the Committee, their time to
6 really look at it and in that same timeframe, we would
7 be getting the stakeholder comments and then as I say
8 have at least a full day meeting with the
9 subcommittee.

10 VICE CHAIRMAN SHACK: Good. Because I
11 think that's going to be a lot more reasonable.
12 Because it was March, I think it's just going to be
13 too much to review that by March. But I think that
14 would be more realistic. So then you're going to have
15 this technology-neutral framework and then you're
16 going to send that up to the Commission, it looks
17 like, in that April/May timeframe and then say we're
18 going to amend the ANPR to say here's the technology-
19 neutral framework.

20 MS. DROUIN: The actual mechanism of how
21 it's going to get put into the ANPR and on the website
22 we have to work that out.

23 MS. MCKENNA: Yes. It think what we've
24 been envisioning is that we would use our Rule 4 on
25 the website to post additional documents and

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1 information as they come along. To the extent that
2 were for example specific questions we wanted to list
3 then we would supplement the ANPR.

4 I think one of the reasons we were talking
5 about putting out the version of the framework we had
6 in in April was to answer some of the comments the
7 Committee had as to give the people who may be
8 commenting on our plan a little bit idea of where
9 we're headed. We may not be done yet but kind of see
10 where we think we're going with the framework and the
11 basis there. So that would help them inform their
12 comments on should we continue going, are there issues
13 that we haven't considered, those kinds of things.
14 But the exact, is it this address on the forum or
15 something like that we're going to have to work out.

16 VICE CHAIRMAN SHACK: Are you going to be
17 posting comments as you receive them on the website?
18 Is this going to be a live feedback kind of thing?

19 MS. MCKENNA: Well, we normally post them
20 but we don't really go into, I think there's something
21 called, the technical conference or something. We
22 haven't really been envisioning the interactive,
23 online kind of thing. But we always do post the
24 comments.

25 VICE CHAIRMAN SHACK: I meant if others

1 can actually review the comments that you see.

2 MS. McKENNA: Others can review the
3 comments. It's the mechanism. But there's were
4 proposals at one time where you could dialogue almost
5 online and we're not really into that. Yes, when we
6 get the comments we'll post them. People can see them
7 and then if they choose to say, "Those are great
8 comments" or "I disagree with what somebody said" then
9 they would in turn post their comments.

10 VICE CHAIRMAN SHACK: They can post their
11 own.

12 MEMBER KRESS: Let me ask you a strange
13 question about that. Have you ever received comments
14 on such a thing where you're asking for feedback and
15 answering questions from a individual member of the
16 ACRS?

17 MEMBER DENNING: You mean previously.

18 MEMBER KRESS: No, as a response to the
19 advanced notice for rulemaking.

20 MS. DROUIN: I don't know.

21 MEMBER KRESS: As a member of the public
22 for example.

23 MS. DROUIN: I don't know.

24 MEMBER KRESS: You may get something like
25 that this time.

1 MS. DROUIN: That's a hint.

2 MEMBER KRESS: Yes.

3 CHAIRMAN WALLIS: That's advanced notice.

4 MS. DROUIN: Advanced notice.

5 CHAIRMAN WALLIS: I thought about that
6 too. I just wonder if it's appropriate an individual
7 member.

8 MEMBER KRESS: I think it's worth
9 discussing whether it's appropriate or not.

10 CHAIRMAN WALLIS: Because I think we all
11 have some views on this.

12 MEMBER KRESS: And they're different. And
13 it's hard in a forum like this to really get
14 everybody's view on every issue properly articulated
15 and if you're answering a set of questions, do you sit
16 down and --

17 CHAIRMAN WALLIS: Well, if we're not
18 careful, this is so interesting we might become part
19 of the team.

20 MEMBER KRESS: No thank you. Anyway, I
21 just thought it was an interesting concept.

22 MR. HARRISON: Actually I asked a similar
23 comment about it. What if the Staff wanted to make a
24 comment and the comment I received was as a member of
25 the public you can make a comment on what's been put

1 out on the rule forum. So even if you're a member of
2 the NRC Staff, you actually could do that. So if a
3 staff member could do that, then I would assume that
4 the ACRS can do that.

5 MEMBER APOSTOLAKIS: Can you really
6 complete the technology-neutral framework without
7 attempting to write the regulatory guides? Will you
8 know enough? Don't you think that by trying to write
9 the regulatory guides for the gas cooled fast reactor
10 for example will give you significant input and
11 insights so that perhaps you will have to change the
12 technology-neutral framework?

13 MS. DROUIN: That is a possibility and we
14 recognize that.

15 MEMBER APOSTOLAKIS: It says complete. I
16 assume that's before you're going to the regulatory
17 guides.

18 MS. DROUIN: When I say complete, that
19 doesn't mean that you can't come back and you may have
20 completed building your house but over times you make
21 changes to it.

22 MEMBER APOSTOLAKIS: Why isn't the
23 framework you have in the report of last January
24 complete?

25 MS. DROUIN: There were a lot of things we

1 hadn't worked out yet.

2 MEMBER APOSTOLAKIS: But the basic
3 elements were there.

4 MS. DROUIN: At a conceptual level, yes.

5 MEMBER APOSTOLAKIS: Yes. But that's my
6 point that until you start doing the regulatory guides
7 which you cannot because you don't have designs, you
8 will have to be at the conceptual level, won't it?

9 MS. DROUIN: No, there was still stuff
10 that we have been working on for the past year that
11 was going past the conceptual level.

12 MEMBER APOSTOLAKIS: Like?

13 MS. DROUIN: For example, I hate to bring
14 this one up, but design basis accident versus design
15 basis events. We have a concept for that and we've
16 been trying to work out what do you mean if you want
17 to have we're calling it licensing based events using
18 risk insights from the get-go versus predescribing up
19 front a set of design basis accidents. I don't need
20 to go and develop regulatory guides to try and go past
21 just that concept.

22 MEMBER APOSTOLAKIS: So it's conceptual.

23 MS. DROUIN: No, what I'm saying is I've
24 gone past the concept and we've laid out a way to do
25 that. When we put this out in April, we look forward

1 to the people's views on what we've proposed of how
2 you go about doing that.

3 MEMBER APOSTOLAKIS: So the technology-
4 neutral framework will play the role of the general
5 design criteria? It will be at that level?

6 MS. DROUIN: Ultimately but I don't want
7 to make promises at this point.

8 CHAIRMAN WALLIS: I think you should
9 explain that though in this document you put that
10 that's your intent to set up a framework which can
11 replace general design criteria.

12 MS. DROUIN: The attempt of the framework
13 is to give the criteria in the guidelines that when
14 you implement those criterion guidelines it's telling
15 you how to write.

16 CHAIRMAN WALLIS: So it's going to spawn
17 some criteria. Is that what it's going to do? The
18 framework is going to --

19 MS. DROUIN: No, it's going to contain
20 criteria and guidelines and this is the criterion
21 guidelines you use to formulate your technology-
22 neutral regulations.

23 CHAIRMAN WALLIS: What I'm trying to say
24 is you're going to go out and say I'm going to design
25 an airplane to the world. You have to have some idea

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1 what it's going to look like.

2 MEMBER KRESS: Wings and tail.

3 MEMBER-AT-LARGE SIEBER: Wings.

4 CHAIRMAN WALLIS: Very interesting.

5 MS. DROUIN: Okay. Then just in closing
6 again as we started off, we were not requesting a
7 letter and our paper is due tomorrow and thank you
8 very much.

9 CHAIRMAN WALLIS: Is it ready?

10 MS. DROUIN: The paper is ready.

11 CHAIRMAN WALLIS: So it's ready to be
12 mailed.

13 MS. DROUIN: It's ready to be --

14 VICE CHAIRMAN SHACK: There's a
15 significant revision in the one you have.

16 CHAIRMAN WALLIS: But it's ready with the
17 revision.

18 MEMBER APOSTOLAKIS: So tomorrow only the
19 Commission gets it.

20 MS. DROUIN: No, tomorrow the EDO. It
21 goes to the EDO.

22 MEMBER APOSTOLAKIS: When does the
23 Commission get it?

24 MS. DROUIN: After the EDO signs off.

25 MEMBER POWERS: When the EDO says that's

1 what happens.

2 MR. BIRMINGHAM: You have a draft.

3 MS. DROUIN: You all receive it.

4 (Discussion off microphone.)

5 CHAIRMAN WALLIS: Are we finished, Joe?

6 MR. BIRMINGHAM: Yes.

7 CHAIRMAN WALLIS: Finished? Do you want
8 to wrap it up?

9 MR. BIRMINGHAM: I'll maybe speaking a
10 little bit out of school, but the EDO will probably
11 sign it fairly shortly, three days maybe. Then it
12 will go to the Commission. If the Commission doesn't
13 object, the Commission frequently makes a SECY paper
14 public in about five days.

15 CHAIRMAN WALLIS: Okay.

16 MR. BIRMINGHAM: There are exceptions of
17 course but this doesn't appear to me to one of those.

18 MEMBER APOSTOLAKIS: That gives me an idea
19 of the time schedule.

20 VICE CHAIRMAN SHACK: Are there any
21 further questions?

22 MS. DROUIN: I wouldn't expect to see it
23 go to the Commission before the end of December
24 because of the holidays and everything that are
25 factored into this.

1 VICE CHAIRMAN SHACK: Further input from
2 the Committee?

3 MEMBER KRESS: What if the Commission asks
4 you when you get to the point of taking it to them,
5 what does the ACRS think about this? What would you
6 tell them since we don't have a letter?

7 MS. DROUIN: I would say we briefed the
8 ACRS.

9 MEMBER-AT-LARGE SIEBER: Yes, go ahead.

10 MEMBER POWERS: And they were extremely
11 enthusiastic.

12 MR. BIRMINGHAM: We had several
13 volunteers.

14 MS. DROUIN: To be on our team.

15 MR. BIRMINGHAM: I think the comment is
16 that we briefed the ACRS.

17 MEMBER POWERS: It doesn't say we can't
18 send them a letter even if they're not requesting one.

19 MEMBER APOSTOLAKIS: I don't even have a
20 copy.

21 MEMBER KRESS: I'm toying with that
22 thought.

23 MEMBER POWERS: Our ability to draft a
24 letter in this area is questionable.

25 MEMBER AT LARGE SIEBER: Is this related

1 to your question about ACRS members -- so you can get
2 comments?

3 MEMBER POWERS: Our ability to draft a
4 useful letter in this area.

5 CHAIRMAN WALLIS: So do you want an
6 agreement at this time that we're not going to write
7 a letter? Would that be appropriate to decide and to
8 give you feedback?

9 VICE CHAIRMAN SHACK: I don't think it's
10 time to make the decision right now.

11 CHAIRMAN WALLIS: Does anybody have a
12 burning desire to write a letter? Does anyone feel
13 like we ought to write a letter? So it looks as
14 though we're not going to write a letter.

15 VICE CHAIRMAN SHACK: No, I think that's
16 something we need to discuss later.

17 CHAIRMAN WALLIS: I don't know. Just to
18 give you some sort of feedback. Maybe there is some
19 feeling we should write a letter.

20 MEMBER APOSTOLAKIS: Will we all have a
21 copy of this?

22 MEMBER KRESS: No.

23 CHAIRMAN WALLIS: So it's premature to
24 write a letter if you don't have it.

25 VICE CHAIRMAN SHACK: You have the older

1 version.

2 CHAIRMAN WALLIS: Yes.

3 VICE CHAIRMAN SHACK: You don't have the
4 12.6 version which is the most recent one I have.

5 MS. DROUIN: But you do have, we did send
6 it to Mike. So you do have it.

7 CHAIRMAN WALLIS: But if we haven't gotten
8 it, we would have to study it. We'll think about it.

9 MR. SNODDERLY: Plus the true fact was the
10 questions that the ANPR itself has not changed the
11 questions. The ANPR is changed but the intent has not
12 changed.

13 VICE CHAIRMAN SHACK: Well, there's a
14 certain flavor there in the earlier version. There
15 was a question of whether this was a good idea and
16 that comment was asked up front. Now in the new
17 version, we're going ahead with Part 53.

18 MR. HARRISON: I think it still asks the
19 question.

20 MS. DROUIN: We still have the question.

21 VICE CHAIRMAN SHACK: It's far less direct
22 than it was in the earlier version at least as I read
23 it.

24 MR. HARRISON: Because they were separate
25 documents.

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1 VICE CHAIRMAN SHACK: Because they were
2 separate documents.

3 MR. HARRISON: When we brought them
4 together, you got a front piece.

5 VICE CHAIRMAN SHACK: Right up front, it
6 was more like what do you think of this idea.

7 MEMBER APOSTOLAKIS: I remember that the
8 rumor was, it was more than a rumor, but the
9 Commission was cool towards this. When did they
10 change their views? Why is this all of a sudden an
11 important endeavor or they were never cool? I
12 remember Commissioner Merrifield saying that until
13 somebody submits it.

14 CHAIRMAN WALLIS: The reason is that now
15 it's become more realistic that there will be these
16 new designs coming down the pipe.

17 MEMBER APOSTOLAKIS: Do you mean the
18 design for generation floor?

19 CHAIRMAN WALLIS: Not necessarily.

20 MEMBER APOSTOLAKIS: What do we mean?

21 MR. SNODDERLY: I think the feedback that
22 was given at the last public meeting was that industry
23 wants to focus on the risk-informed rulemaking that
24 are currently ongoing, 50.46(a), 50.69, finish those
25 up and then we'll look at it from a case by case

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1 basis. But I think the words that were used they're
2 going to get most of their bang for their buck or
3 that's where they want this focus and it probably
4 won't be much more and that the technology-neutral
5 framework would be more focused on the generation
6 floor plans.

7 MEMBER APOSTOLAKIS: That's what I --

8 MR. SNODDERLY: But for the COLs that are
9 being discussed today, those people would use the
10 current framework, the current ESPs, COLs and design
11 certs.

12 MEMBER APOSTOLAKIS: You're talking about
13 something that's in the future.

14 MR. SNODDERLY: So we're talking about --
15 Yes, that was my impression.

16 MR. HARRISON: But just maybe from a
17 personal perspective, I think one of the things we're
18 finding now is if you wait until you see plants ready
19 to come in you're too late.

20 MEMBER APOSTOLAKIS: I understand that.

21 MR. HARRISON: So this is to get a head
22 start on that next generation.

23 MEMBER APOSTOLAKIS: I just don't
24 understand the urgency.

25 CHAIRMAN WALLIS: Realistically, George,

1 it takes some years to develop this thing thoroughly.

2 MEMBER APOSTOLAKIS: How come it wasn't
3 urgent six months ago?

4 CHAIRMAN WALLIS: Well, time has gone by.

5 MR. SNODDERLY: Well, Mary, maybe that's
6 the answer. When is your due date for providing the
7 technology-neutral framework, the next stage?

8 MS. DROUIN: I think if I recall the
9 milestone in terms of having the technical basis
10 complete was 2007.

11 MEMBER APOSTOLAKIS: That's what you said,
12 December 2007.

13 MS. DROUIN: That sounds correct to me.

14 CHAIRMAN WALLIS: Two years from now.

15 MR. SNODDERLY: Because when I looked at
16 that table too, it looks --

17 MS. DROUIN: And that's consistent with
18 the schedule we've had all along. We haven't
19 accelerated the schedule from what we've been working.

20 VICE CHAIRMAN SHACK: It looked like to me
21 that the next time you're coming to us for our opinion
22 is in this SECY paper in October '06. Because in the
23 technology-neutral framework, it didn't appear from
24 that table that you're saying you need a letter from
25 us on the technology-neutral framework. Am I

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1 mistaken?

2 MS. DROUIN: In terms of when we're going
3 to come back to the full committee, a lot of that's
4 going to dictate of what's going to happen over the
5 next six months. We're going to get a lot of feedback
6 from this ANPR. We're going to have this next version
7 of the framework out in April. We're going to get I'm
8 sure a lot of comments. We're going to come back to
9 the subcommittee. I'm sure we'll get a lot of
10 feedback from the subcommittee.

11 So it's hard for me to say until I see
12 what those comments are. I'd like to think the
13 comments are going to be that the team's done a great
14 job. You don't need to do anything different. But I
15 think that's unrealistic.

16 MR. HARRISON: But to come back to
17 George's comment, I think if you look at the dates of
18 the recent SRMs that are directing this, one was May.
19 Three of them were September of this year.

20 MEMBER APOSTOLAKIS: Something changed.

21 MR. HARRISON: There is a move forward.

22 MEMBER APOSTOLAKIS: I don't know what it
23 is.

24 MR. HARRISON: Like I say, when you see
25 three SRMs back to back saying do this, then I think

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1 it's moved this.

2 MEMBER APOSTOLAKIS: Something happened in
3 the last three or four months. I remember distinctly
4 that Commissioner Merrifield was very cool toward the
5 whole thing.

6 MEMBER KRESS: But I think the concept may
7 be that for the plants coming in for licensing or
8 certification, the new ones. Maybe they'll come in
9 and try to fit them into the current regulatory system
10 more than likely. But to review them, it would be
11 highly useful to have these concepts in mind that
12 you're developing.

13 MS. DROUIN: Yes.

14 MEMBER KRESS: And I think you may not use
15 them directly but you certainly could use them
16 indirectly.

17 MS. DROUIN: And that's been recognized
18 and that was as you know, I hate to resurrect SECY
19 130, one of the reasons we moved forward in June on
20 that was to also support preapplication reviews. So
21 we've always recognized that there are issues,
22 technical and policy issues, and developing the
23 technology-neutral framework that will support the
24 ongoing preapplication reviews.

25 MR. HARRISON: And that's called out for

1 in the ANPR plan.

2 MEMBER APOSTOLAKIS: It just occurred to
3 me. I don't know if you're already talking to them
4 but maybe you should try a little harder to bring into
5 your workshops actual designers of Gen-4 reactors
6 because we had a workshop at MIT.

7 VICE CHAIRMAN SHACK: There's an actual
8 designer.

9 MEMBER APOSTOLAKIS: What? There are a
10 lot of efforts around the country.

11 VICE CHAIRMAN SHACK: It's conceptualized.

12 MEMBER APOSTOLAKIS: Well, yes. I mean at
13 Oak Ridge there is a proposal that a lot of people are
14 looking at by Charles Forsberg.

15 VICE CHAIRMAN SHACK: Yes. That's a
16 proposal.

17 MEMBER APOSTOLAKIS: Favorably. There is
18 a lot of work in France at MIT under gas cooled fast
19 reactor and there was a workshop at MIT several months
20 ago where there were people from Idaho and so on, all
21 of them designers, and I gave a ten minute briefing on
22 the technology-neutral framework. Nobody had ever
23 heard of it.

24 MS. DROUIN: I'm surprised because Idaho
25 has been coming.

1 MEMBER APOSTOLAKIS: Oh, but there are
2 many Idahoes.

3 MS. DROUIN: No, but the design, they came
4 in and gave us a two day workshop on their design.

5 MEMBER APOSTOLAKIS: Good. So maybe that
6 was afterwards. But I think those people you should
7 try to maybe encourage to participate a little more
8 because for example if you take these policy issues
9 that the CDF has to be 10^{-5} or whatever and so on,
10 these guys have no idea that this may be coming.
11 Right now, they are competing against each other. So
12 they are producing 10^{-8} , 10^{-9} , 10^{-10} and 10^{-11} , but not
13 because of licensing issues but because they don't
14 want your design to look better than mine. Anyway,
15 that's a thought.

16 CHAIRMAN WALLIS: Are we about through
17 with this now?

18 MEMBER APOSTOLAKIS: We're never through
19 with this.

20 CHAIRMAN WALLIS: But for today.

21 MEMBER APOSTOLAKIS: Yes, for today.

22 CHAIRMAN WALLIS: Are we through for
23 today?

24 MS. DROUIN: Thank you very much.

25 CHAIRMAN WALLIS: Should we thank the

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1 presenters? Thank you, Mary, very much.

2 MEMBER KRESS: Thank you, Mary.

3 CHAIRMAN WALLIS: We are going to take a
4 break until 5:00 p.m.

5 MEMBER APOSTOLAKIS: And we'll write a
6 letter.

7 CHAIRMAN WALLIS: Then I would like to
8 have at least the first draft of as many letters as
9 possible so we can go over all of them and know where
10 we stand and give the major feedback necessary to the
11 authors. We don't need the transcript from now on.
12 We're going to come back at 5:00 p.m. Thank you. Off
13 the record.

14 (Whereupon, at 4:39 p.m., the above-
15 entitled matter was concluded.)

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CERTIFICATE

This is to certify that the attached proceedings
before the United States Nuclear Regulatory Commission
in the matter of:

Name of Proceeding: Advisory Committee on
Reactor Safeguards

528th Meeting

Docket Number: n/a

Location: Rockville, MD

were held as herein appears, and that this is the
original transcript thereof for the file of the United
States Nuclear Regulatory Commission taken by me and,
thereafter reduced to typewriting by me or under the
direction of the court reporting company, and that the
transcript is a true and accurate record of the
foregoing proceedings.



Tobias Walter
Official Reporter
Neal R. Gross & Co., Inc.

NEAL R. GROSS
COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

**Final Draft Generic Letter
on Hemyc and MT Fire Barriers**



Sunil Weerakkody, Chief
Fire Protection Branch
Division of Risk Assessment
Office of Nuclear Reactor Regulation

ACRS Meeting
Rockville, MD
December 8, 2005

Rockville, MD
December 8, 2005

Purpose of Meeting

- To present the final draft Generic Letter 2006-XX: "Impact of Potentially Degraded Hemyc and MT Fire Barriers on Compliance with Fire Protection Programs"
- To obtain ACRS endorsement on the proposed generic letter



Rockville, MD
December 8, 2005

Generic Letter – Purpose

- To request that addressees identify whether Hemyc/MT is relied on for separation and/or safe shutdown
- To request that affected addressees provide a --
 - Description of the installation
 - Discussion of whether installation is in compliance, in light of new information
 - Description of compensatory measures
 - Corrective action schedule



Rockville, MD
December 8, 2005

**Final Draft Generic Letter
on Hemyc and MT Fire Barriers**



Presenters,
Angie Lavretta, 301-415-3285
Daniel Frumkin, 301-415-2280

ACRS Meeting
Rockville, MD
December 8, 2005

Rockville, MD
December 8, 2005

Presentation Summary

- History
- Current Status
- Generic Letter Contents
- Public Comments & Comment Resolution
- Risk Assessment
- Conclusion



Rockville, MD
December 8, 2005

History

- Fire barrier issues raised in the 1980's
- Generic Letter 92-08 issued: called for re-assessment of all fire barrier types
- Action Plan implemented to resolve Thermo-Lag/Fire Protection issues, upgraded fire protection program inspections
- Recent NRC inspections of Hemyc raised NRC concern
- NRC initiated Hemyc and MT confirmatory tests



Rockville, MD
December 8, 2005

Recent Background

- NRC Hemyc and MT tests revealed previously- unidentified failure mode
- Information Notice 2005-07
- Public petitions filed (2)
- Plant-specific assessments needed/ draft generic letter published for comment
- Public meeting held
- Comments incorporated into final draft GL
(Note: At least two of the 14 units affected have already begun fixes)

Rockville, MD
December 8, 2005

7



Generic Letter – Purpose

- To request that addressees identify whether Hemyc/MT is relied on for separation and/or safe shutdown
- To request that affected addressees provide a --
 - Description of the installation
 - Discussion of whether installation is in compliance, in light of new information
 - Description of compensatory measures
 - Corrective action schedule
- To require a written response in accordance with 10 CFR 50.54(f)

Rockville, MD
December 8, 2005

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Generic Letter – Requested Action

- Within 60 days, provide the following:
 - A statement on whether Hemyc or MT fire barrier material is used at their NPP and whether it is relied on for separation and/or safe shutdown purposes in accordance with 10 CFR 50.48 or other regulatory commitments, including whether Hemyc or MT is credited in other analyses (e.g., exemptions, license amendments, GL 86-10 analyses)
 - A description of programmatic controls in place to ensure other fire barrier types will be assessed for potential degradation, in light of new information

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December 8, 2005

9



Generic Letter – Requested Information

- Within 60 days, affected licensees are requested to address the following:
 - Whether the Hemyc and/or MT is degraded, in light of new findings of potential degradation. And plans for compensatory measures and corrective actions.
 - Justification for no corrective actions
 - Detailed description of Hemyc and/or MT installation
 - Detailed description of compensatory measures
 - Corrective actions implementation schedule, including intended licensing actions or exemptions

Rockville, MD
December 8, 2005

10



Generic Letter – Requested Information

- After implementing corrective actions, but no later than December 1, 2007, affected licensees are requested to provide the following:
 - Confirmation of compliance via corrective actions
 - A summary of the evaluation used for the "safety assessment"

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December 8, 2005

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Public Comments

- PCI Promatec
- Progress Energy
- Nuclear Energy Institute
- Duke Power
- STARS
- Exelon/AmerGen

Rockville, MD
December 8, 2005

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Public Comments

Bin #	Description	# Rec'd
1	Comment on Backfit Determination	4
2	Comment on Schedule	4
3	Comment on Hemyc Testing	5
4	Comment on Risk-Informing	3
5	Comment on GL 86-10, Supp. 1	5
6	Miscellaneous Comment	3
7	Comment on Details—e.g., wording, refs.	11
8	Comment on Burden Estimate	0

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December 8, 2005

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CRGR Comments

- CRGR Review/Questions
 - Backfit determination
 - Information request is not a backfit
 - Application of GL 86-10, Supplement 1
 - Change in impact determination
- Resolution
 - Removed incorrect reference to backfit
 - Clarified use of NFPA 251 and GL 86-10, Supp. 1
 - Explained minor change in impact determination

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Simplified Risk Analysis

- Assumptions
 - Hemyc failure probability models generalized from test results, including sensitivity cases
 - Conservatism from the FPSDP
 - Typical, but not necessarily bounding, NPP fires and room layouts (combustibles, etc.)
- Determination
 - We do not expect any "high risk" situation

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GL Issuance will Accomplish

- Compliance
- Plant-specific issues resolution
- Compensatory measures
- Corrective actions

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Questions?

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December 8, 2005

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Hemyc Electrical Raceway Fire Barrier Systems – Confirmatory Testing

Office of Nuclear Regulatory Research

Presentation at the Nuclear Regulatory Commission Headquarters
 Office of Nuclear Regulatory Research - ACRB Presentation
 Rockville, Maryland, December 8, 2005

<p> Mark Henry Bailey, P.E. Team Leader, Fire Research Team Office of Nuclear Regulatory Research (301) 415-8840 MHBA@NRC.GOV </p>	<p> Hugh (Roy) Woods P.E., Ph.D. Hemyc Testing Project Manager Office of Nuclear Regulatory Research (301) 415-8822 HWY@NRC.GOV </p>
--	---

U.S. Nuclear Regulatory Commission
 Washington, DC 20555-0001

Use of Hemyc & MT

- Hemyc is a One-Hour Electrical Raceway Fire Barrier Systems (ERFBS) used to protect Post-Fire Safe-Shutdown circuits
 - Hemyc may also have been used as Radiant Energy Shield
- MT is a Three-Hour ERFBS used to protect Post-Fire Safe-Shutdown circuits
 - MT may also have been used as a One Hour ERFBS

December 8, 2005

Testing Criteria - NFPA 251 & Generic Letter 86-10 Supplement 1

- GL 86-10 Supplement 1, Standardizes and Clarifies Performance Test Method and Acceptance Criteria
- Expanded Methodology Options
 - Tested Empty & Fully Loaded Conduits
 - Tested Supports Independently
- Acceptance Criteria from NFPA 251
 - Average Temperature Rise ($\Delta T_{ave.}$) \leq 250 °F
 - Maximum Single Point Temperature Rise ($\Delta T_{max.}$) \leq 325 °F
 - Hose Stream Test

December 8, 2005

Hemyc Test #1 - March 11, 2005 Omega Point Laboratories

- 1", 2-1/2", and 4" Rigid Steel Conduits
 - Empty and Fully Loaded
 - Alternate 6" collars and 2" overlap joints
- 18"x24"x8" Junction Box
 - Direct Application- Stitched Only Hemyc Installation
- Structural Supports
 - Unistrut
 - 2" Tube Steel

December 8, 2005

Hemyc Test 1 - Results

- 1", 2-1/2", and 4" Rigid Steel Conduits
 - Exceeded $\Delta T_{max.}$ - 33 to 43 minutes
 - Both joint designs opened during test
- 18"x24"x8" Junction Box
 - Exceeded $\Delta T_{max.}$ - 15 minutes
 - ERFBS Fell off during test
- Structural Supports
 - Unistrut Exceeded $\Delta T_{max.}$ - 22 to 32 minutes
 - 2" Tube Steel Exceeded $\Delta T_{max.}$ - 13 to 25 min.

December 8, 2005

Hemyc Test 1 Observations

- Siltemp Shrinkage
 - Joint Openings
 - Non Uniform Thermal Results
 - Follow on Material Property Testing performed by Sandia National Laboratories
- Structural Steel Support/Intervening Items Protection
 - Testing Minimum 3" Required Protection was Limiting

December 8, 2005

Hemyc Test #2 - March 25, 2005 Omega Point Laboratories

- 12", and 36" Ladder Back Cable Trays
 - Tested Empty
 - Alternate 2" Air Gap and Direct Attachment
- 18"x24"x8" Junction Box
 - Direct Attachment with SS Bands
- Cable Air Drops
 - Direct Attachment
 - 2" Air Gap

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Hemyc Test #2 - Results

- Ladder Back Cable Trays
 - Exceeded ΔT_{max} - 18 to 35 minutes
 - Both designs opened during test
- 18"x24"x8" Junction Box
 - Exceeded ΔT_{ave} - 31 minutes
 - ERFBS remained in place during test
- Cable Air Drops
 - Direct Attachment Exceeded ΔT_{max} - 32 min.
 - 2" Air Gap Exceeded ΔT_{max} - 28 min.

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Hemyc Test #2 Observations

- Siltemp Shrinkage
 - Joint Openings / Tearing of Siltemp
 - Non Uniform Thermal Results

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MT Test #3 - April 25, 2005 Omega Point Laboratories

- 1", 2-1/2", and 4" Rigid Steel Conduits
 - Empty and Fully Loaded
 - Direct Attachment
- 18"x24"x8" Junction Box
- Cable Air Drop
- Structural Supports
 - Unistrut
 - 2" Tube Steel

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MT Test #3 - Results

- 1", 2-1/2", and 4" Rigid Steel Conduits
 - Exceeded ΔT_{max} - 87 to 113 minutes
- 18"x24"x8" Junction Box
 - Exceeded ΔT_{max} - 122 minutes
- Cable Air Drop
 - Exceeded ΔT_{max} - 159 minutes
- Structural Supports
 - Unistrut Exceeded ΔT_{max} - 58 min.
 - 2" Tube Steel Exceeded ΔT_{max} - 56 min.

December 8, 2005

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MT Test #3 Observations

- Siltemp Shrinkage
 - Joint Opening in Outer Layer
 - Damage to Second Layer
 - Non Uniform Thermal Results
- Structural Steel Support/Intervening Items Protection
 - Testing Minimum 18" Required Protection was Limiting

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Sandia National Laboratories Material Testing

- **Material Properties**
 - Compared Tested Material (Refrasil) to New Old Stock Material (Silttemp)
 - "Silttemp" equivalent to "Refrasil"
 - Both manufactured in a "Standard" and "Pre-Shrunk" Version
 - Tan color = Standard
 - White color = Pre-Shrunk
- **Shrinkage**
 - Radiant Heating Testing
 - Shrinkage starts ~ 842 °F
 - Shrinkage on order of 5 – 10%

December 6, 2005

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Industry Testing, August 23, 2005

- Hemyc Users Group performed independent testing using one of RES test configurations
 - Used New Old Stock (NOS) Silttemp circa 1980's
 - Minimum Upgrades – Increased Collar size, Greater Overlaps, Extra Layer, Larger Bands
- Results were very similar to RES results
 - Thermal Shrinkage
 - Exceeded Maximum Allowable Temperature

December 6, 2005

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Summary

- RES has completed all Confirmatory Fire Performance Testing
 - Hemyc Final Test Reports Available
 - MT Final Test Report Available
- All Configurations Tested did not meet Acceptance Criteria
 - Discovered new failure mode (Thermal Shrinkage)
- Value of Experimental Testing

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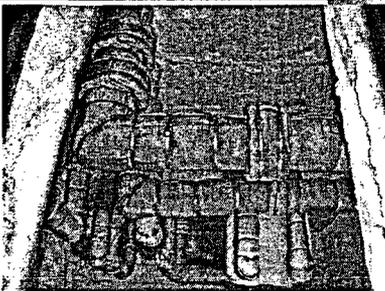
Conclusion/Photos

- RES provided technical input to NRR for Regulatory action
 - NRR issued Information Notice 2005 07
 - NRR issued Draft Generic Letter for Comment
 - NRR & RES held a Public Meeting in April 2005 to share results with all interested stakeholders

December 6, 2005

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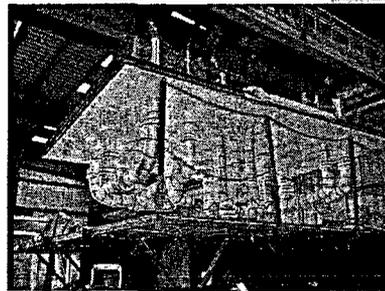
Hemyc - Before Test



December 6, 2005

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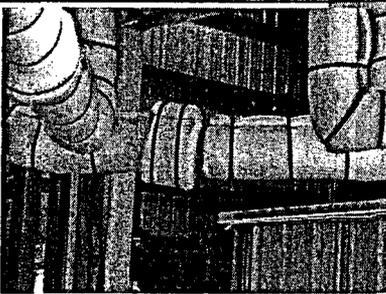
Hemyc – After 1-Hour Fire Test



December 6, 2005

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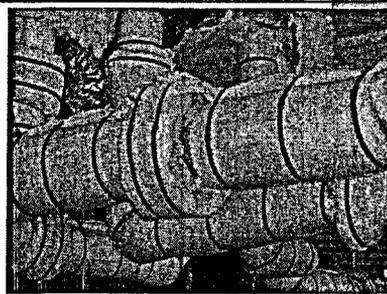
Hemyc - Joint Failure



December 8, 2005

10

Hemyc - Joint Failure



December 8, 2005

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Hemyc - Joint Failure



December 8, 2005

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Hemyc ACRS Presentation

- Supplemental Information
 - The following slides provide supplemental information for the December 8, 2005 ACRS presentation

December 8, 2005

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Purpose of Hemyc Fire Testing

- Fire Performance Testing
 - No NPP Site Specific Configurations
- Follow on to Inspector Findings beginning around 2000
- Scope of Testing Limited to Fire Performance
 - No Ampacity Derating
 - No Seismic Position Retention
- Follow on Material Property Testing
 - Siltemp thermal shrinkage
 - Siltemp/Refrasil Equivalence

December 8, 2005

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Background

- ERFBS Installed in 1980's
- 10CFR50 Appendix R Compliance
- Generic Letter 92-08 "Thermo-Lag" Follow-On
- SECY 99-204 Kaowool
 - V.C. Summer Performance Testing
- TIA 99-028 Hemyc
 - Identified Concerns with Fire Performance Testing

December 8, 2005

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"Creative Nuclear Power is Neither Required nor Desired" - Ancient Nuclear Proverb

- Hemyc is a simple insulation material.
 - Performance follows Fourier's Law:
 - $q = -kA \, dT/dX$
 - Where:
 - q is rate of heat flow across area
 - k is thermal conductivity
 - A is surface area
 - T is temperature
 - X is distance normal to surface
 - Why test?

December 4, 2005

Confirmatory Fire Performance Test Plan

- Develop "Typical" Electrical Raceway Configurations
- Install the ERFBS in accordance with Manufactures Vendor Manual & Procedures
- Interfaced with Industry to better understand what was installed in NPPs
 - No NPP Site Specific Installations
- Testing Performed in accordance with:
 - NFPA 251 Criteria
 - Generic Letter 86-10 Supplement 1 Guidance

December 4, 2005

Test 1 - Conduit, Supports & Junction Box HEMYC 1 Hour Fire Performance Test Results

Raceway	Time to ΔT _{ave} ≥ 325°F (min.)	Time to Single Point ΔT > 325°F (min.)	Max. Temp. Bare #8 @ 1 hour (°F) (Note 1)	Joint Failure/ Structural Failure Yes/No (Note 2)	Pass Hose Stream Yes/No (Note 3)	Final Grade Rating (Min) (Note 4)
1" Conduit (Empty)	40	42	1013	Yes	Yes	42
1" Conduit 1.62 lb./ft. Cable Fill	44	34	1177	Yes	Yes	34
2 1/2" Conduit (Empty)	48	41	708	Yes	Yes	41
2 1/2" Conduit 5.85 lb./ft. Cable Fill	51	36	446	Yes	Yes	36
4" Conduit (Empty)	49	33	855	Yes	Yes	33
4" Conduit 14.84 lb./ft. Cable Fill	57	43	199	Yes	Yes	43
Junction Box 18" x 24" x 8" (Note 5)	17	15	NA	Yes	Yes	15
Unfired Support (Note 6)	NA	22 - 32	NA	NA	Yes	22 - 32
2" Tube Steel Support	NA	13 - 25	NA	NA	Yes	13 - 25

Conduit, Supports & Junction Box HEMYC 1 Hour Fire Performance Test Results (cont.)

- Note 1 - Bare #8 temps should be viewed with caution
 - Instrumented Bare # 8 located in center of cable bundle
 - Outer layers experienced joint failures - Hotspots
- Note 2 - All Hemyc experienced thermal shrinkage of outer Siltemp
- Note 3 - All assemblies would have failed hose stream testing
 - No Additional Hemyc was dislodged during hose stream test
- Note 4 - All raceways failed on single point criteria (ΔT > 325°F)
- Note 5 - Junction Box experienced catastrophic failure when Hemyc mat seams opened & the Hemyc mat fell off the JB
- Note 6 - Structural support failure occurred when time to Single Point temperature rise (ΔT) exceeded 325°F at 3-inches into Hemyc protected structural steel.

December 4, 2005

Test #2 - Cable Tray, Junction Box, & Airdrop Hemyc 1-Hour Fire Performance Test Results

Raceway	Right Side Tray Rail ΔT _{ave} ≥ 325°F (min.)	Right Side Tray Rail Single Point ΔT > 325°F (min.)	Left Side Tray Rail ΔT _{ave} ≥ 325°F (min.)	Left Side Tray Rail Single Point ΔT > 325°F (min.)	Bare #8 ΔT _{ave} ≥ 325°F (min.)	Bare #8 Single Point ΔT > 325°F (min.)	Sum- Through/ Structural Failure Yes/No (Note 1)	Pass Hose Stream Yes/No (Note 2)	Final Grade Rating (Min) (Note 3)
12" Cable Tray Empty, Direct Attachment	30	34	27	18	32	32	Yes	Yes	18
12" Cable Tray Empty, 2" Air Gap	37	35	38	35	33	34	Yes	Yes	35
36" Cable Tray Empty, Direct Attachment	41	39	34	33	35	35	Yes	Yes	33
36" Cable Tray Empty, 2" Air Gap	32	31	33	32	28	27	Yes	Yes	31
Air Drop, Direct Attachment	NA	NA	NA	NA	35	32	Yes	Yes	32
Air Drop, 2" Air Gap	NA	NA	NA	NA	32	28	Yes	Yes	28
18" 124" x 8" Junction Box, Direct Attachment with Bands	31	32	NA	NA	NA	28	Yes	Yes	31

Test #2- Cable Tray, Junction Box, & Airdrop Hemyc 1 Hour Fire Performance Test Results (cont.)

- Note 1 - All Hemyc experienced thermal shrinkage of outer Siltemp covering
- Note 2 - All assemblies would have failed hose stream testing since raceway was exposed to joint failure
 - No Additional Hemyc was dislodged during hose stream test
- All raceways except junction box failed on single point criteria (ΔT > 325 °F)

December 4, 2005

Test #3- Conduit, Cable Air Drop, Supports & Junction Box

M.T. 3 Hour Fire Performance Test Results

Raceway	Time to $\Delta T_{max} \geq 250^\circ F$ (min.)	Time to Single Point $\Delta T > 325^\circ F$ (min.)	Max. Temp. Bare #8 @ 3 hour ($^\circ F$) (Note 1)	Joint Failure/ Structural Failure Yes/No (Note 2)	Pass Hose Stream Yes/No	Final Grade Rating (Note 3)
4" Conduit (Empty)	121	110	961	YES	YES	110
4" Conduit 14.55 lb./in. Cable Fill	143	113	374	YES	YES	113
2 1/2" Conduit (Empty)	119	103	119	YES	YES	103
2 1/2" Conduit 5.88 lb./in. Cable Fill	126	112	577	YES	YES	112
1" Conduit (Empty)	96	87	1314	YES	YES	87
1" Conduit 0.85 lb./in. Cable Fill	106	96	1084	YES	YES	96
Junction Box 18" x 24" x 8"	122	134	NA	YES	YES	122
Unbraced Support (Note 4)	NA	58	NA	YES	YES	58
Bare Copper Wire Air Drop	169	159	807	YES	YES	159
2" Tube Steel Support	NA	56	NA	YES	YES	56

**Test #3 - Conduit, Cable Air Drop, Supports & Junction Box
M.T. 3 Hour Fire Performance Test Results (cont.)**

- Note 1 - Bare #8 Temps should be viewed with caution
 - Instrumented Bare #8 located in center of cable bundle
 - Joint failure occurred in two outer layers
- Note 2 - All M.T. experienced thermal shrinkage of Siltemp covering and hydrate packet layer
- Note 3 - All raceways except junction box failed on single point $\Delta T > 325^\circ F$
- Note 4 - Structural support failure occurred when single point $\Delta T > 325^\circ F$ at 18-inches into protected structural steel

December 8, 2008



**Presentation to the Advisory
Committee on Reactor Safeguards**

**Early Site Permit Application
for Grand Gulf Nuclear Station**

December 8, 2005

Entergy / System Energy Resources, Inc.



Entergy ESP Team

- Entergy
 - C R Hutchinson, Vice President, Business Development
 - Kenneth Hughey, Michael Bourgeois, George Zinke
- Enercon Services
 - Al Schneider, Guy Cesare
- William Lettis & Associates
 - William Lettis



Presentation Agenda

- General Information
- Summary: Resolution of DSER Open Items
- Recent Gulf Coast Hurricane Experience
- Potential Hazards in Vicinity of Site
- Site Flooding Review



General Information

- Location: Claiborne County, MS; eastern bank of Mississippi River
- GGNS Site Property - Approx 2100 acres
- Nearest “population center”: Vicksburg, MS (~25 miles N; population ~27,000)
- Principal nearby town: Port Gibson, MS (~ 6 miles SE; population ~ 1750)



General Information





General Information

- Proposed ESP facility, located on existing Grand Gulf Nuclear Station Site
- GGNS Unit 1 licensed June 1982
- Site Owner and ESP Applicant - System Energy Resources, Inc (SERI)
- GGNS Unit 1 Operator - Entergy Operations
- ESP Application Preparer - Entergy Nuclear Potomac, Inc.



DSER Open Item Resolution

- DSER issued 4/7/05
- SERI responses to DSER Open Items
 - Primary response: 6/21/05
 - Supplemental information in several letters 6/28 through 9/16/05
- FSER issued 10/21/05



DSEER Open Item Resolution

- DSEER Open Items or sub-items: 31
- Summary Disposition Status in FSER
 - (25) Resolved (including 10 Emerg. Planning sub-items to be reviewed at COL)
 - (3) Disposition by assignment of COL Action Item
 - (3) Permit condition



Recent Gulf Coast Hurricane Experience

- ESP application submitted Oct, 2003
- NRC Letter to NEI, 7/6/2005, ESP Finality
 - New and Significant Information
 - COL Applicant: Reasonable Process
- 10 CFR 52.79, Contents of Applications
- Recent Gulf Coast Hurricane Experience
 - Not submitted to NRC Staff
 - Not part of ESP Basis



Recent Gulf Coast Hurricane Experience

- Key Site Characteristics and Parameters
 - Max. Wind Gust (mph)
 - Max. Precipitation Rate (Inches/hr)
 - PMP (Site flooding)
 - Structural Design:
 - SEI/ASCE 7-02 (max. wind gust at 33' ft. elevation)



Recent Gulf Coast Hurricane Experience

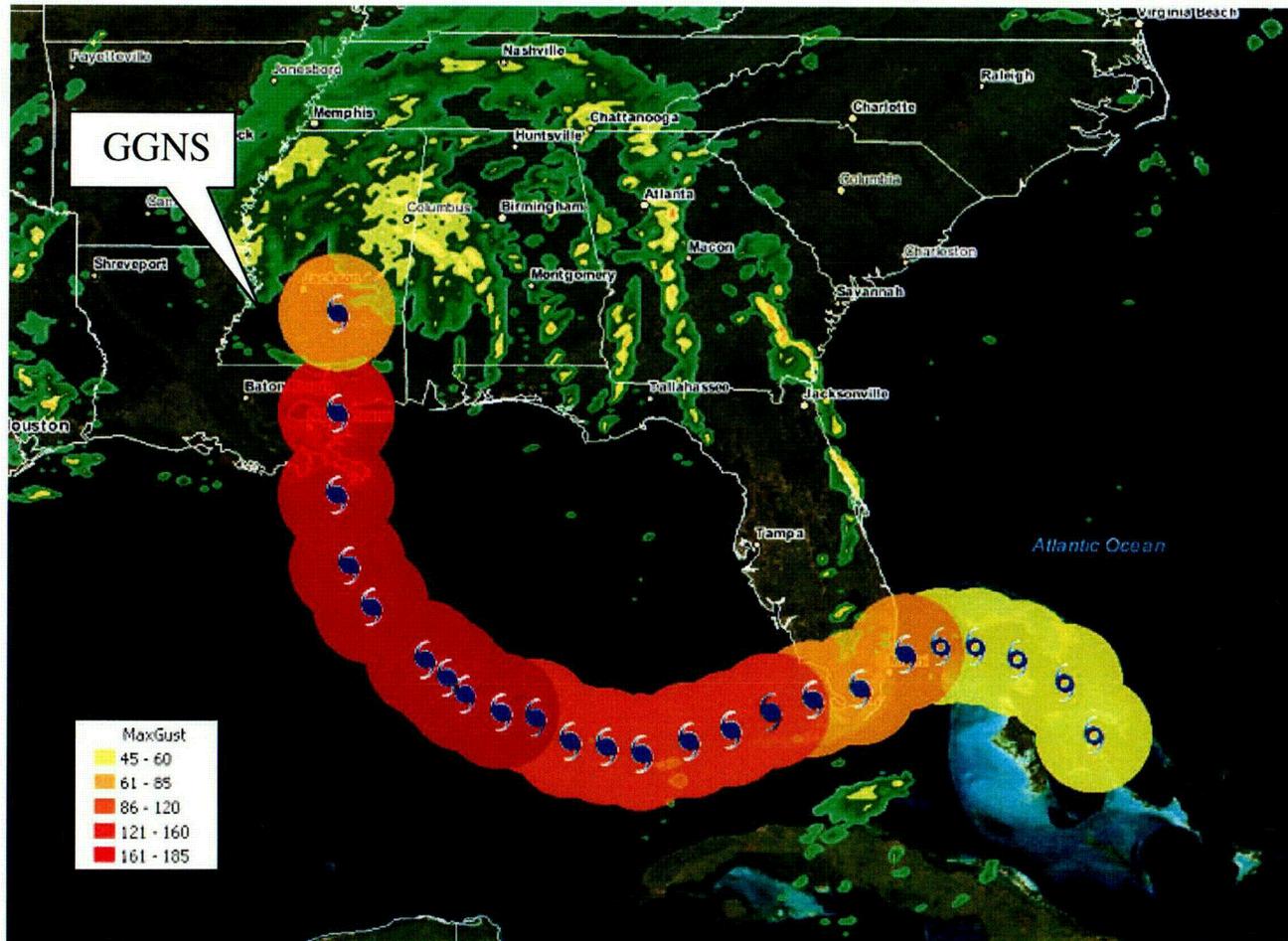
- General ESP methodology
 - Appropriate regional data obtained from industry standards for site
 - Calculation method established in standards for determination of site value
- ESP SAR Results:
 - Max. 3-sec wind gust for GGNS Site: 96 mph
 - Max. 1-hr precipitation: 19.2”



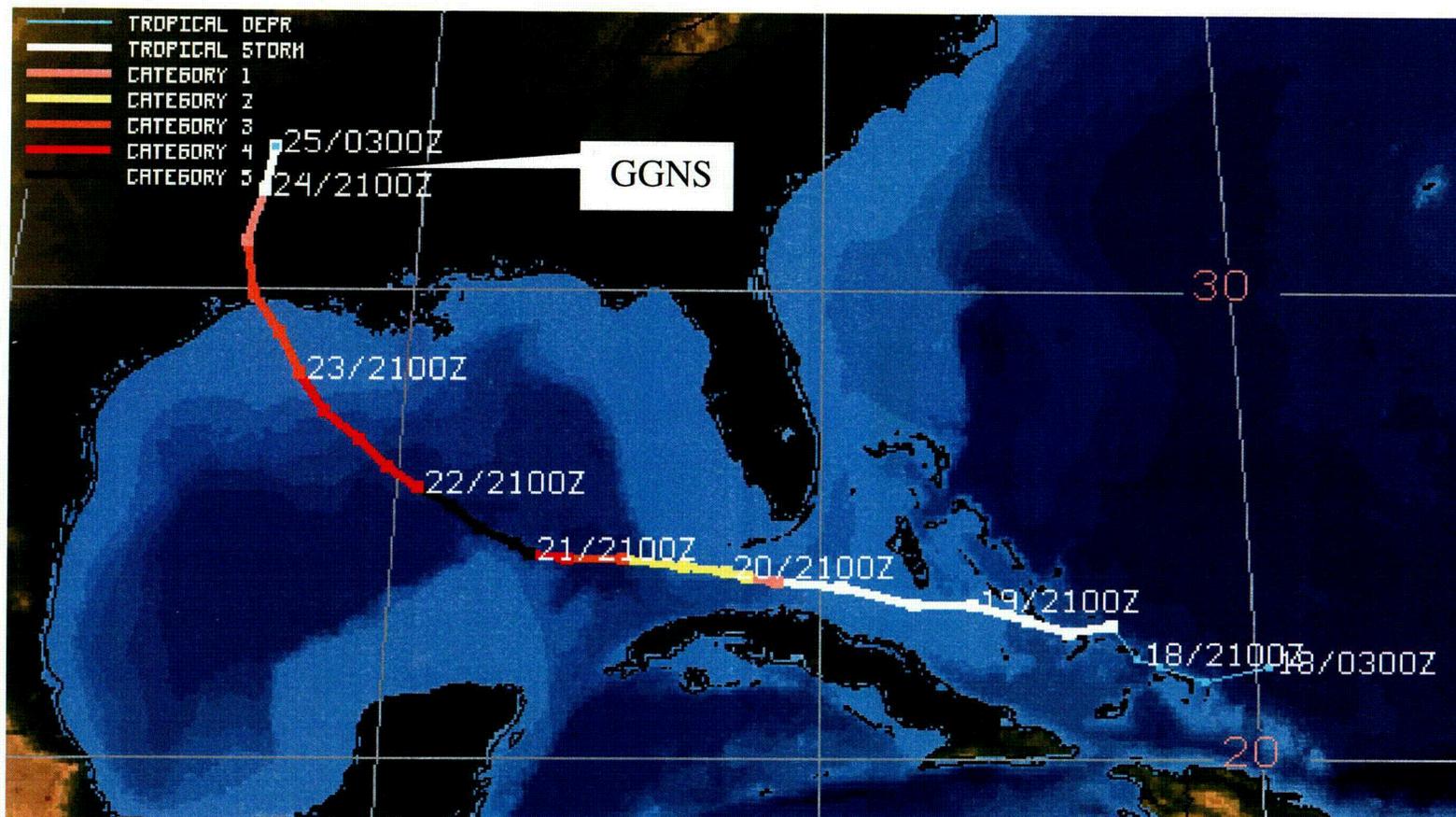
Recent Gulf Coast Hurricane Experience

- GGNS Site Coordinates: Lat. ~32N; Long. ~91W
- Katrina (Category 4; August 29, 2005)
 - Wind Gusts at landfall: 160 mph
 - Passed ~ 90 miles E of Site (Gusts <92 mph at ~32N)
 - Max. GGNS site Hourly Avg: 21 mph
- Rita (Category 4; September 24 , 2005)
 - Wind Gusts at landfall: 150 mph
 - Passed ~ 160 miles W of Site (Gusts ~63 mph at ~32N)
 - Max. GGNS site Hourly Avg: 14 mph
- Camille (Category 5; August 17, 1969)
 - Wind Gusts at landfall (estimated): ~170 mph
 - Passed ~ 10 miles E of Jackson, MS (Gusts ~67 mph at airport)

Hurricane Katrina



Hurricane Rita





Recent Hurricane Experience

- Summary Comparison

	GGNS Site ESP SSAR	Katrina @ ~32N	Rita @ ~32N
Max Wind Gusts	96 mph	<92 mph	~ 63 mph
Max 1 Hr Precipitation	19.2"	[1.4"]*	[2.15"]**
* Measured at Newton MS; may not be peak for this latitude			
** Measured at GGNS Site; may not be peak for this latitude			

- Assessment

- Max wind gusts < ESP site characteristic
- Measured hourly precipitation rate well below ESP site characteristic



Recent Hurricane Experience

- COLA Development
 - Typical process:
 - Identify significant changes, events, information
 - Consult industry standards for updates
 - Evaluate as required
 - Describe changes and supporting analysis in COLA FSAR if required
 - Compare established site characteristics with parameter values assumed in selected reactor vendor's DCD
 - Confirm DCD is bounding; evaluate margins



Recent Hurricane Experience

- SUMMARY
 - Site values based on industry standards for region
 - Recent hurricane experience (wind gusts and precipitation rates) appear bounded by established site values
 - Process at COLA development will evaluate new and significant information
 - Consideration of selected reactor design and margins



ACRS Interim Letter Items

- Hazards
 - Ground & River Transportation Hazards
- Local Onsite Flooding
 - Permit Condition



**Presentation to the Advisory Committee on
Reactor Safeguards on the Early Site Permit
Application for the Grand Gulf Site**

U.S. Nuclear Regulatory Commission

December 8, 2005

Presented by: Raj Anand

NRPB/DNRL/NRR



Purpose

To provide the ACRS an overview of the Grand Gulf early site permit (ESP) safety review



Meeting Agenda

Grand Gulf ESP Safety Review	5 min
Key Review Areas	5 min
Permit Conditions and COL Action Items	5 min
Project Milestones and Summary	5 min
Questions or Comments	5 min



Grand Gulf ESP Safety Review

- The Final SER documents the staff's technical review of the applicant's site safety analysis report and emergency planning information
- SERI requests ESP site be approved for total nuclear generating capacity of up to 8600 MWt, with max 4300 MWt per unit
- SERI has chosen not to submit a specific design but instead has submitted a plant parameter envelope (PPE) based on a number of current and future reactor design



Grand Gulf ESP Safety Review

- The staff's review concluded that:
 - Subpart A of 10 CFR Part 52 and 10 CFR Part 100 have met
 - The exclusion area is acceptable and meets Part 100
 - The proposed site is acceptable for constructing a plant falling within the plant parameter envelop with respect to:
 - Radiological effluent release dose consequences from normal operation
 - Aircraft hazards
 - Physical security plans
 - No physical characteristics unique to the site that could pose a significant impediment to the development of emergency plans



Grand Gulf ESP Safety Review

-
- The staff's review also concluded that:
 - An acceptable description of current and projected population densities in and around the site
 - Potential hazards associated with nearby transportation routes, industrial and military facilities pose no undue risk to the facility
 - Site characteristics related to climatology and the methodologies used to determine the severity of the weather phenomena reflected in these site characteristics are acceptable and contain sufficient margin



Grand Gulf ESP Safety Review

-
- The staff's review also concluded that:
 - Applicant's proposed site characteristics related to hydrology are acceptable with the noted permit condition and COL action items
 - The site is acceptable from a geology and seismology standpoint and meets the requirements of 10 CFR 100.23
 - The applicant has provided appropriate quality assurance measures equivalent to those required by 10 CFR Part 50 Appendix B



Key Review Areas

- **The staff completed its review in the following areas:**
- **Exclusion Area Authority and Control (1)**
 - **Population Distribution (1)**
 - **Nearby Industrial, Transportation, and Military Facilities**
 - **Meteorology (5)**
 - **Hydrology (7)**
 - **Seismology and Geology (5)**
 - **Radiological Effluent Release Dose Consequences from Normal Operations**



Key Review Areas (Continued)

- Aircraft Hazards
 - **Emergency Planning (4)**
 - Industrial Security
 - Accident Analyses
 - Quality Assurance
-
- **There were 23 Open Items in the Draft SER**
 - **Resolution of all Open Items discussed in the Final SER,**



Proposed Permit Conditions and COL Action Items

- There are 3 proposed Permit Conditions in the Final SER (10 in the Draft SER)
- There are 26 COL Action Items in the Final SER (18 COL Action Items in the Draft SER)



Proposed Permit Conditions

1. Obtain and execute agreements providing for shared control of the Grand Gulf ESP exclusion area, including State approvals before construction begins under a CP or COL referencing the ESP
2. Requires the new units radwaste systems be designed with features to preclude any and all accidental releases of radionuclides into any potential liquid pathway
3. Perform geologic mapping of future excavations for safety-related facilities



COL Action Items

- COL Action Items included to:
 - Ensure that significant issues are tracked and considered during the COL phase
 - Identify issues that shall be addressed by an applicant who submits an application referencing the Grand Gulf ESP



Project Milestones

- **Received Grand Gulf ESP application – October 16, 2003**
- **Draft SER issued – April 7, 2005**
- **ACRS Subcommittee on Draft SER – May 16, 2005**
- **ACRS Full Committee on Draft SER – June 2, 2005**
- **ACRS Interim letter to the EDO – June 14, 2005**
- **Staff Response to ACRS letter – August 12, 2005**



Project Milestones

- **Final SER Issued – October 21, 2005**
- **ACRS Meeting on Final SER – December 8, 2005**
- **ACRS Letter to the EDO – December 22, 2005**
- **Final SER Issue as NUREG – January 28, 2006**



Grand Gulf ESP Summary

- **Final SER is issued on October 21, 2005**
- **The Grand Gulf ESP site characteristics with the limitations and conditions proposed by the staff comply with Part 100 requirements**
- **Reactor(s) having characteristics that fall within the parameters identified in the ESP, and which meet the terms and conditions proposed in the final SER, can be constructed and operated without undue risk to the health and safety of the public**
- **Issuance of the Grand Gulf ESP will not be inimical to the common defense and security or to the health and safety of the public**
- **Questions or comments?**

Final Draft Generic Letter on Hemyc and MT Fire Barriers



**Sunil Weerakkody, Chief
Fire Protection Branch
Division of Risk Assessment
Office of Nuclear Reactor Regulation**

**ACRS Meeting
Rockville, MD
December 8, 2005**

Purpose of Meeting

- To present the final draft Generic Letter 2006-XX: “Impact of Potentially Degraded Hemyc and MT Fire Barriers on Compliance with Fire Protection Programs”
- To obtain ACRS endorsement on the proposed generic letter



Generic Letter – Purpose

- To request that addressees identify whether Hemyc/MT is relied on for separation and/or safe shutdown
- To request that affected addressees provide a --
 - Description of the installation
 - Discussion of whether installation is in compliance, in light of new information
 - Description of compensatory measures
 - Corrective action schedule



Final Draft Generic Letter on Hemyc and MT Fire Barriers



Presenters,
Angie Lavretta, 301-415-3285
Daniel Frumkin, 301-415-2280

ACRS Meeting
Rockville, MD
December 8, 2005

Presentation Summary

- History
- Current Status
- Generic Letter Contents
- Public Comments & Comment Resolution
- Risk Assessment
- Conclusion



History

- Fire barrier issues raised in the 1980's
- Generic Letter 92-08 issued: called for re-assessment of all fire barrier types
- Action Plan implemented to resolve Thermo-Lag/Fire Protection issues, upgraded fire protection program inspections
- Recent NRC inspections of Hemyc raised NRC concern
- NRC initiated Hemyc and MT confirmatory tests



Recent Background

- NRC Hemyc and MT tests revealed previously-unidentified failure mode
- Information Notice 2005-07
- Public petitions filed (2)
- Plant-specific assessments needed/
draft generic letter published for comment
- Public meeting held
- Comments incorporated into final draft GL
(Note: At least two of the 14 units affected have
already begun fixes)



Generic Letter – Purpose

- To request that addressees identify whether Hemyc/MT is relied on for separation and/or safe shutdown
- To request that affected addressees provide a --
 - Description of the installation
 - Discussion of whether installation is in compliance, in light of new information
 - Description of compensatory measures
 - Corrective action schedule
- To require a written response in accordance with 10 CFR 50.54(f)



Generic Letter – Requested Action

- Within 60 days, provide the following:
 - A statement on whether Hemyc or MT fire barrier material is used at their NPP and whether it is relied on for separation and/or safe shutdown purposes in accordance with 10 CFR 50.48 or other regulatory commitments, including whether Hemyc or MT is credited in other analyses (e.g., exemptions, license amendments, GL 86-10 analyses)
 - A description of programmatic controls in place to ensure other fire barrier types will be assessed for potential degradation, in light of new information



Generic Letter – Requested Information

- Within 60 days, affected licensees are requested to address the following:
 - Whether the Hemyc and/or MT is degraded, in light of new findings of potential degradation. And plans for compensatory measures and corrective actions.
 - Justification for no corrective actions
 - Detailed description of Hemyc and/or MT installation
 - Detailed description of compensatory measures
 - Corrective actions implementation schedule, including intended licensing actions or exemptions
-



Generic Letter – Requested Information

- After implementing corrective actions, but no later than December 1, 2007, affected licensees are requested to provide the following:
 - Confirmation of compliance via corrective actions
 - A summary of the evaluation used for the “safety assessment”



Public Comments

- PCI Promatec
- Progress Energy
- Nuclear Energy Institute
- Duke Power
- STARS
- Exelon/AmerGen



Public Comments

Bin #	Description	# Rec'd
1	Comment on Backfit Determination	4
2	Comment on Schedule	4
3	Comment on Hemyc Testing	5
4	Comment on Risk-informing	3
5	Comment on GL 86-10, Supp. 1	5
6	Miscellaneous Comment	3
7	Comment on Details—e.g., wording, refs.	11
8	Comment on Burden Estimate	0



CRGR Comments

- **CRGR Review/Questions**
 - Backfit determination
 - Information request is not a backfit
 - Application of GL 86-10, Supplement 1
 - Change in impact determination
- **Resolution**
 - Removed incorrect reference to backfit
 - Clarified use of NFPA 251 and GL 86-10, Supp. 1
 - Explained minor change in impact determination



Simplified Risk Analysis

- Assumptions
 - Hemyc failure probability models generalized from test results, including sensitivity cases
 - Conservatism from the FPSDP
 - Typical, but not necessarily bounding, NPP fires and room layouts (combustibles, etc.)
- Determination
 - We do not expect any “high risk” situation



GL Issuance will Accomplish

- Compliance
- Plant-specific issues resolution
- Compensatory measures
- Corrective actions



Questions?

Rockville, MD
December 8, 2005

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Staff Plan to Make a Risk-Informed and Performance-Based Revision to 10 CFR Part 50

Presented to
Advisory Committee on Reactor Safeguards

Presented by
US Nuclear Regulatory Commission
Mary Drouin, (301) 415-6675, mxd@nrc.gov
Donald Harrison, (301) 415-3587, dgh@nrc.gov
Joseph Birmingham, (301) 415-2829, jlb4@nrc.gov

December 8, 2005

1

Purpose

- Brief Committee on the staff's SECY paper with enclosed Advance Notice of Proposed Rulemaking (ANPR)
 - "Plan to Make a Risk-Informed and Performance-Based Revision to 10 CFR Part 50"
- Inform the Committee on how the ACRS views on SECY-05-0130 are being considered by the staff
- The staff is not requesting a letter from the Committee

2

Difference in Current Paper and Earlier Version

- Draft SECY paper provided to Committee on November 18, 2005
- SECY paper to be provided to the EDO has changed
 - Staff proposal is the same
- Program plan is in the enclosed ANPR and is not a separate enclosure to the SECY paper

3

Background (Four Related SRMs)

1. May 9, 2005, in response to RES briefing, Commission directed
 - staff to develop a formal program plan to make a risk-informed and performance-based revision to 10 CFR Part 50
2. September 9, 2005, in response to SECY-05-0120, "Security Design Expectations for New Reactor Licensing Activities," Commission approved
 - staff's recommendation to establish security performance standards for future reactor concepts as part of the technology-neutral framework

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Background (Four Related SRMs) cont'd

3. September 14, 2005, in response to SECY-05-0130, "Policy Issues Related to New Plant Licensing and Status of the Technology-Neutral Framework for New Plant Licensing," Commission directed the staff to
 - develop in an expeditious fashion an ANPR,
 - incorporate into the ANPR the formal program plan to risk-inform Part 50, as well as other related risk-informed efforts, and
 - integrate safety, security, and preparedness throughout the effort.
4. September 21, 2005, in response to SECY-05-0138, "Risk-Informed and Performance-Based Alternatives to the Single-Failure Criterion," Commission directed the staff to
 - develop expeditiously an ANPR,
 - include the effort to develop risk-informed and performance-based alternatives to the single failure criterion, and
 - integrate safety, security, and preparedness throughout the effort.

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Background (cont'd)

- Impacts four programs:
 - Developing the regulatory structure for new plant licensing
 - Security design expectations for new reactor licensing activities
 - Coherence
 - Risk-informing the technical requirements of 10 CFR Part 50

6

Staff Proposal

- Create an alternative to 10 CFR Part 50 that is risk-informed and performance-based and applicable to all reactor technologies (referred to as "Part 53")
- Integrate safety, security and emergency preparedness
- Address coherence by ensuring that the reactor regulations and staff processes and programs, are built on a unified safety concept and are properly integrated so that they complement one another
- Continue with ongoing efforts to risk-inform and performance-base the current regulations in 10 CFR Part 50
 - Additional rulemakings to risk-inform other regulations in 10 CFR Part 50 will not be initiated in the short term

7

Proposed Approach for Part 53

- Issue an Advance Notice of Proposed Rulemaking (ANPR)
- ANPR will remain open until the technical basis is complete
- Upon completion of technical basis, staff will request Commission direction and approval to initiate formal rulemaking

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ANPR

- Ensures NRC's intent is known to all stakeholders
- Allows NRC to proceed to risk-inform the requirements in an open, integrated and transparent manner
- Solicits stakeholder input throughout the technical basis development period
 - E.g., as new issues identified, supplement ANPR

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ANPR Contents

- NRC plan to develop an integrated risk-informed and performance-based revision to 10 CFR Part 50
- Policy issues
 - Integration of safety, security and emergency preparedness
 - Level of safety and integrated risk
 - ACRS letter on these issues
 - Containment functional performance requirements
 - Definition of defense-in-depth
 - Single failure criterion
- Technology-neutral framework
- Continuation of ongoing efforts to risk-inform and performance-base the current regulations in 10 CFR Part 50

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Updates to the Commission

- Feedback on stakeholder input to the ANPR
- Recommendations
 - policy issues on level of safety and integrated risk
 - path forward on containment functional performance standards and on definition of defense-in-depth
 - additional policy and technical issues, as identified
 - initiation of formal rulemaking on a new Part 53
 - initiation of formal rulemaking to revise other regulations in 10 CFR Part 50, if identified

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Next Steps

- Paper with enclosed ANPR to EDO 12-9-05
- Continue to engage ACRS
- Hold public meetings and workshops
- Supplement ANPR, as needed
- Complete technology-neutral framework
- Initiate formal rulemaking after Commission approval

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In Summation

- Not requesting letter from Committee
- Staff SECY paper due to the EDO
December 9, 2005

GGNS ESP DSER Open Item Resolution Summary Table

Open Item No.	DSER Section	Open Item Subject	DSER Open Item Resolution
2.1-1	2.1.2.3	Demonstrate that the applicant has control over the exclusion area or has a right to obtain such control.	This is Permit Condition 1 .
2.1-2	2.1.3.3	Include weighted transient population data in Tables 2.1-1 and 2.1-2 of the SSAR.	Additional information submitted; DSER Open Item closed.
2.3-1	2.3.1.3	Provide acceptable 100-year return period maximum and minimum dry-bulb temperatures.	Additional information submitted; DSER Open Item closed.
2.3-2	2.3.1.3	Provide the 48-hour probable maximum winter precipitation (PMWP) that can be used with the 100-year snowpack to define the extreme winter precipitation load site characteristics.	Additional information submitted; DSER Open Item closed.
2.3-3	2.3.1.3	Identify an additional ultimate heat sink (UHS) meteorological site characteristic for use in evaluating the potential for water to freeze in the UHS water storage facility.	Additional information submitted; DSER Open Item closed.
2.3-4	2.3.1.3	Identify a 3-second gust wind speed that represents a 100-year return period for the ESP site.	Additional information submitted; DSER Open Item closed.
2.3-5	2.3.5.3	Identify x/Q and D/Q values for the nearest milk cow and meat cow.	Additional information submitted; DSER Open Item closed.
2.4-1	2.4.1	Provide corrected UTM coordinates of the center of the proposed power block and/or revise Figure 2.1-1 in the SSAR to show the correct location and coordinates.	Additional information submitted; DSER Open Item closed.
2.4-2	2.4.1	Provide information on the elevation (depth) of the zone that could be disturbed by the construction of the new facility, such that the local subsurface environment and its alignment with the existing hydrogeological environment could be altered.	Additional information submitted; DSER Open Item closed.
2.4-3	2.4.1	Provide more details regarding dewatering wells to allow the staff to determine whether ground surface subsidence could affect safety-related	This is COL Action Item 2.4-2 .

GGNS ESP DSER Open Item Resolution Summary Table

Open Item No.	DSER Section	Open Item Subject	DSER Open Item Resolution
		structures and piping. Provide information related to the location of dewatering wells in relation to safety-related structures and associated monitoring of the ground water table.	
2.4-4	2.4.1	Provide more details regarding the floodwater level estimation, including data and methods used to arrive at the floodwater elevation of 133.25 feet MSL.	This is COL Action Item 2.4-3.
2.4-5	2.4.2	Revise and present estimates of the local intense precipitation as shown in Table 2.4-7 of the SSAR using the guidelines of HMR 52.	This is COL Action Item 2.4-5.
2.4-6	2.4.13	Provide further description of the rationale for considering Sr-90 and Cs-137 in the radionuclide transport analysis.	This is Permit Condition 2.
2.4-7	2.4-13	Factors, such as soil, sediment, and rock characteristics; adsorption and retention coefficients; ground water velocity; and distances to the nearest body of surface water are important to hydrological radionuclide transport. Provide these site characteristics from onsite measurements.	This is Permit Condition 2.
2.5-1	2.5.2	Provide justification for not updating the background seismic source for the ESP site.	Additional information submitted; DSER Open Item closed.
2.5-2	2.5.2	Provide and evaluate the criteria or weights used for ranking of model clusters and the judgments involved in balancing data consistency and adherence to seismological principles in the EPRI 2003 ground motion evaluation. Explain how recordings from a single earthquake can provide well-resolved values of both crustal quality factor (Q) and site kappa, also explain why the Q value of 317 at 1 Hz is much lower than values found in other studies of eastern North American earthquakes, and why other studies find less	Additional information submitted; DSER Open Item closed.

GGNS ESP DSER Open Item Resolution Summary Table

Open Item No.	DSER Section	Open Item Subject	DSER Open Item Resolution
		frequency dependence of Q in the eastern North American than in the western North American.	
2.5-3	2.5.2	Provide an explanation why the magnitude and distance bin corresponding to the SRSZ makes no contribution to the hazard deaggregation.	Additional information submitted; DSER Open Item closed.
2.5-4	2.5.2 & 2.5.4	Provide justification on applying the generic shear wave velocity profile derived from Memphis area to the ESP site and on its applying kappa value derived from ground motion observation on the Mississippi embayment in the sensitivity test.	Additional information submitted; DSER Open Item closed.
2.5-5	2.5.4	Provide the basis for the selection of values of BE, UB, and LB and other parameters for the base case profile.	Additional information submitted; DSER Open Item closed.
13.3-1		Provide responses to the following issues related to State and local emergency plans:	NA
a	13.3.3.7	Describe the communications arrangements with fixed and mobile medical support for the State of Mississippi and with mobile medical support for Claiborne County.	The staff will review during a COL or OL review.
b	13.3.3.8	Describe the dissemination of information regarding the special needs of the handicapped to the general public in the State of Louisiana on a periodic basis.	The staff will review during a COL or OL review.
c	13.3.3.11	Describe the means for the use of radioprotective drugs for emergency workers and institutionalized persons within the plume exposure pathway EPZ in the States of Louisiana and Mississippi whose immediate evacuation may be infeasible or very difficult.	The staff will review during a COL or OL review.
d	13.3.3.12	Describe the State of Mississippi's guidance related to bioassay or whole body counting for determining offsite emergency worker doses from the uptake of radioactive material (e.g., ingestion)	The staff will review during a COL or OL review.
e	13.3.3.13	Clarify the apparent inconsistencies between the	The staff will review during a COL or OL review.

GGNS ESP DSER Open Item Resolution Summary Table

Open Item No.	DSER Section	Open Item Subject	DSER Open Item Resolution
		LPRRP and Enclosure I to Attachment 2 to LPRRP Supplement II regarding the description of contacts and arrangements for local and backup hospital services.	
f	13.3.3.13	Describe the special radiological capabilities for the hospitals listed in Tab 2 of LPRRP Chapter 10.	The staff will review during a COL or OL review.
g	13.3.3.11	Provide information regarding the availability and capacity of school buses or other transportation methods, the availability of drivers, and the process for mobilizing transportation for students, residents, transients, and special needs populations in Claiborne County and Tensas Parish during an evacuation (e.g., evacuations may require a single trip or they may require return trips).	The staff will review during a COL or OL review.
h	13.3.3.11	Provide a map(s) illustrating evacuation/shelter areas in the State of Mississippi for the MREPP Annex O.	The staff will review during a COL or OL review.
i	13.3.3.11	Information on shelter capacities is not contained in, and therefore, not evaluated by FEMA under the LPRRP. Provide sheltering capacities for relocation centers in the State of Louisiana or documentation of evaluation performed to determine whether adequate capacity exists.	The staff will review during a COL or OL review.
13.3-2	13.3.3.8	Describe in Part 4 the applicant's responsibility for making information available to offsite authorities for distribution consistent with MREPP Annex J.	The staff will review during a COL or OL review.
13.3-3	13.3.3.9	Describe the adequacy of the TSC, OSC, and EOF and related equipment used to support emergency response activities, to address, with specificity, such facility and equipment features as location, size, structure, habitability, communications, staffing and training, radiation monitoring,	SERI responded that it considered the remaining open questions regarding the OSC, TSC, and EOF to be more appropriately addressed in the context of full and integrated emergency plans, which would be submitted with a COL application, rather than the ESP application.

GGNS ESP DSER Open Item Resolution Summary Table

Open Item No.	DSER Section	Open Item Subject	DSER Open Item Resolution
		instrumentation, data system equipment, power supplies, technical data and data systems, and record availability and management.	The staff concluded that the proposed major feature H is unacceptable.
13.3-4	13.3.3.11	Address whether discussions on results of the 2003 ETE study were held with officials from the States of Mississippi and Louisiana involved in implementing traffic management plans, according to Appendix 4 to NUREG-0654/FEMA-REP-1 and NUREG/CR-4831, or provide confirmation that State reviews were not required based on discussions with appropriate officials.	<p>SERI responded that it had provided sufficient information regarding emergency plans in accordance with 10 CFR 52.17, and that this issue would be more appropriately addressed in the context of full and integrated emergency plans, which would be submitted with a COL application, rather than this ESP application.</p> <p>Subsequently, the GGNS licensee, in response to a RAI, stated the following in its letter dated June 28, 2005: All agencies in the States of Louisiana and Mississippi agreed that the 2003 ETE results support the conclusion in the 1986 ETE study, that the entire EPZ can be evacuated in any time of day or weather conditions in less than 3 hours and remains valid.</p> <p>The staff reviewed the applicant's response, as supplemented by a letter from the GGNS licensee dated June 28, 2005, and found that the results of the 2003 ETE study were subsequently reviewed and concurred on by the appropriate State officials. Therefore, Open Item 13.3-4 is resolved.</p>