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

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1 UNITED STATES OF AMERICA

2 NUCLEAR REGULATORY COMMISSION

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4 ADVISORY COMMITTEE ON REACTOR SAFEGUARD

5 (ACRS)

6 + + + + +

7 SUBCOMMITTEE ON PLANT OPERATIONS

8 AND FIRE PROTECTION

9 + + + + +

10 TUESDAY, AUGUST 18, 2009

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12 ROCKVILLE, MARYLAND

13 + + + + +

14 The Subcommittee convened at the Nuclear
15 Regulatory Commission, Two White Flint North, Room
16 T2B3, 11545 Rockville Pike, at 8:30 a.m., John D.
17 Sieber, Chairman, presiding.

18 SUBCOMMITTEE MEMBERS:

19 JOHN D. SIEBER, Chair

20 SAID ABDEL-KHALIK

21 DENNIS C. BLEY

22 MARIO V. BONACA

23 HAROLD B. RAY

24 WILLIAM J. SHACK

25 JOHN W. STETKAR

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NRC STAFF PRESENT:

- PETER WEN, Cognizant Staff Engineer
- KATHY WEAVER, Cognizant Staff Engineer
- SUNIL WEERAKKODY
- DANIEL FRUMKIN
- HAROLD BARRETT

ALSO PRESENT:

- STEVEN HUTCHINS
- TOM GORMAN

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

8:30 a.m.

CHAIR SIEBER: The meeting will now come to order.

This is a meeting of the Plant Operations and Fire Protection Subcommittee, and I am Jack Sieber, Chairman of the Subcommittee.

ACRS members in attendance are Harold Ray, John Stetkar, Said Abdel-Khalik. George Apostolakis is supposed to be here, but I don't see him. Dennis Bley, and Peter Wen of the ACRS staff is the Designated Federal Office for this meeting. And Bill Shack, a member, is also present.

The purpose of this meeting is to review Draft Regulatory Guide 1.189, Revision 2, Fire Protection for Nuclear Power Plants, and its associated documents.

We will hear presentations from representatives of the Office of Nuclear Reactor Regulation. The Subcommittee will gather information, analyze relevant issues and facts, and formulate proposed positions and actions as appropriate for deliberation by the full Committee.

This morning Reg Guide 1.189 is a revision that has been two years in the making, roughly. It

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1 relates to the deterministic treatment of fire
2 protection rules, and about 50 percent of U.S. nuclear
3 power plants will fall under this regulation.

4 This afternoon we will talk, have a
5 meeting related to the probabilistic analysis of fire
6 protection rules which will apply to the other 50
7 percent of the plants if the industry follows through
8 on its use of that Regulatory Guide. So today we will
9 hear both the deterministic and the probabilistic
10 issues at hand.

11 The rules for participation in today's
12 meeting were announced as part of the notice of this
13 meeting previously published in the Federal Register
14 on July 15th, 2009.

15 We have not received any requests from
16 members of the public wishing to make oral statements.

17 However, the Nuclear Energy Institute will present
18 its view as a portion of the meeting, and a portion of
19 the meeting has been reserved for that purpose.

20 A transcript of the meeting is being kept
21 and will be available, as stated in the Federal
22 Register notice. Therefore, we request that
23 participants in this meeting use the microphones
24 located throughout the meeting room when addressing
25 the Subcommittee.

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1 Participants should first identify
2 themselves and speak with sufficient clarity and
3 volume so they can be readily heard, especially by me.

4 We will now proceed with the meeting, and
5 I call on Sunil Weerakkody of the Office of Nuclear
6 Reactor Regulation to introduce the presenters.

7 Sunil?

8 MR. WEERAKKODY: Thank you.

9 I'm Sunil Weerakkody. I'm the Deputy
10 Director, Fire Protection, of the Division of Risk
11 Assessment in the Office of Nuclear Reactor
12 Regulation.

13 We are here today to present Draft Reg
14 Guide 1.189 to you and request your endorsement to it.

15 To give you the context of the specific
16 part of 1.189 we would like to brief you on, in 2006,
17 the staff wanted to issue a Generic Letter to the
18 industry to address the issue of multiple spurious
19 actuations of fire-induced circuits. The Commission
20 disapproved that effort and directed the staff to work
21 with the industry to come up with methods that the
22 industry can use in order to disposition this issue.

23 Since then, a team, led by Dan Frumkin,
24 who is the team leader in Fire Protection, has been
25 working with the industry, had numerous public

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1 meetings with NEI and other interested stakeholders to
2 develop those methods.

3 We believe that in Reg Guide 1.189 we are
4 proposing a method that the industry can choose to use
5 in order to come into compliance with the regulatory
6 expectations with respect to multiple spurious
7 actuations.

8 As you may be aware, if this Committee and
9 the full Committee endorses issuance of this Reg
10 Guide, we plan to issue it in the fourth quarter of
11 this year. As soon as this Reg Guide is issued, a
12 clock starts for the industry to start implementing
13 the expectations and come into compliance.

14 With that, I am going to introduce Dan
15 Frumkin, who is sitting all by himself in the front
16 there. Alex Klein, who is the Branch Chief, is out.

17 So, Dan, if you could please give the NRC
18 perspectives on where we are with respect to 1.189.

19 MR. FRUMKIN: Thank you, Sunil. I think
20 you just took my first three slides.

21 (Laughter.)

22 But what I am going to talk about today is
23 the background of the issues, the changes that we have
24 made to the Regulatory Guide. I am also going to talk
25 about the public comments that we have received,

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1 discussion of the public comments that were not
2 incorporated that were received, and an explanation of
3 why those comments, why the non-incorporation of those
4 comments is not going to be a problem with the path
5 forward. Then the path forward is, as Sunil
6 discussed, of issuance of the Reg Guide and licensees
7 applying this, and the end of enforcement discretion,
8 which we have in the area of circuit failures that
9 takes fire protection out of the normal regulatory
10 process.

11 So the long-term goal is to end all these
12 enforcement discretions that we have for multiple
13 spurious and manual actions and get fire protection
14 into the normal regulatory process.

15 As Sunil mentioned, back in 2006, we
16 issued a Commission paper, a SECY 06-0196, which had
17 attached to it a proposed Generic Letter which was one
18 approach, which was at the time the recommended staff
19 approach to bring fire-induced circuit failures,
20 multiple spurious actuations to closure.

21 The Commission's response in their SRM,
22 their Staff Requirements Memorandum, to that SECY
23 stated that the generic letter in its current form did
24 not contain the necessary specificity for a licensee
25 to understand what they are supposed to do, and sent

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1 the NRC back to the drawing board, and to examine
2 licensee analysis methods in this area, including
3 those using system or functional scenario development
4 approaches and using the normal public regulatory
5 process to enable stakeholder engagement, develop or
6 endorse guidelines that provide a clearly-defined
7 method of compliance for those licensees who do not
8 choose to adopt NFPA 805.

9 This second paragraph is our clear
10 direction from the Commission. In my opinion, the
11 staff followed this bullet by bullet to bring this
12 issue to closure.

13 The response to that Commission paper was
14 issued in Commission Paper SECY 08-0093, which was
15 titled, Resolution of Issues Related to Fire-Induced
16 Circuit Failures. The Commission Paper is about 25
17 pages long, but this diagram pretty much provides as
18 much information as is needed to explain the concept
19 of how to bring fire-induced circuit failures.

20 Obviously, the devil is in the details,
21 and that is where the comments from the industry come
22 in, but I think it is the overall concept, I'll say,
23 that I am about to explain about this diagram is the
24 NRC and the industry stakeholders are on the same
25 page. From this diagram, we have gone to more and

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1 more details that are documented in the Reg Guide.
2 Then, when we get to some various points, there are
3 some disagreements between the staff and the industry,
4 but overall the umbrella concept is very consistent.

5 What is in this diagram, it is a diagram
6 that you have a tank of some sort, two redundant
7 trains, just for example, and they provide the source
8 through the pumps and the valves to the vessel that we
9 need to put water in. This is not an actual plant
10 system. It is just a diagrammatical, just to explain
11 the concept.

12 In a reading of the rule, 10 CFR 50,
13 Appendix R, it says that a train of systems necessary
14 to achieve and maintain hot shutdown conditions is
15 required to be protected in accordance with III.G.2,
16 specifically 20 feet of separation with suppression
17 and detection, three-hour barriers or one-hour barrier
18 and suppression and detection.

19 The current staff reading of the rule and
20 the basis of this clarification is only the train of
21 systems necessary to achieve and maintain hot shutdown
22 conditions is required to be protected in that manner.

23 There's other equipment in the plant that
24 has the capability of affecting, adversely affecting,
25 safe shutdown. We have designated that in accordance

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1 with the rule, components important to safe shutdown
2 or components important to safety that could adversely
3 affect safe shutdown or components important to safe
4 shutdown.

5 The most obvious example of this is in
6 this orange oval. There are some circumstances where
7 the orange oval, redundant pump set, there are some
8 circumstances where that pump could start and perhaps
9 adversely affect safe shutdown.

10 But the position of the staff is, as long
11 as the pump system in the green box is protected, that
12 is compliance with III.G.2 and the licensee need only
13 provide assurance through a variety of methods,
14 including III.G.2, but not limited to III.G.2, that
15 the components in the other orange boxes aren't going
16 to affect safe shutdown.

17 So, for example, this could be a surrogate
18 for aux feedwater system, where the RCIC is in the
19 green and the HPCI is in the orange, for example. And
20 if HPCI spuriously starts, you could affect safe
21 shutdown. But if RCIC would be completely protected
22 and HPCI could perhaps be mitigated, once it starts to
23 shut it off, and there was a feasible and reliable
24 manual action, that would be an acceptable manual
25 action, and it wouldn't need to be vetted through

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1 III.G.2.

2 And similarly with the other items in this
3 diagram, Item 1, for example, a drain-down valve on
4 the tank. If that valve were to open due to a
5 spurious actuation, due to a fire, as long as the
6 green box equipment was protected, and you could
7 reliably and feasibly close that valve before you had
8 a challenge to safe shutdown, then that would be
9 acceptable. Also, you could use other tools, which I
10 will get to on other slides.

11 Again, you will see in Item No. 2, this
12 one here, if a PORV or SRV were to open, if it was not
13 required, not part of the safe shutdown system, it
14 could be mitigated with manual actions or other tools,
15 and perhaps even -- this is kind of a surrogate for an
16 RHR system. If those were to open, and it could be
17 feasibly and reliably isolated, or there's other tools
18 available to demonstrate adequate protection, then the
19 control valves for this equipment, the control cables
20 would not necessarily require III.G.2 protection.

21 What I believe is the core of this issue
22 is that there are examples in the plant where PORVs or
23 RHR valves could adversely affect safe shutdown in a
24 very short amount of time. What the previous NRC
25 staff did was they said, well, since it can affect

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1 safe shutdown in a short amount of time, you have to
2 protect it in accordance with III.G.2. But that is
3 not the plain reading of the rule. Because there is a
4 protected train, you don't have to protect it in
5 III.G.2.

6 Now we have had many discussions with the
7 industry, and they are in agreement, to my knowledge,
8 they are in agreement, where feasible and reliable
9 manual actions are not available, and you don't have
10 other means available to protect safe shutdown, then
11 you will have to provide either protections in
12 accordance with III.G.2 or route the cables outside of
13 the area, as in III.G.1-type protection.

14 So we are in agreement that, where there
15 are potential real safety issues because of possible
16 hot shorts, but not for the equipment that is required
17 for safe shutdown, then physical protection might be
18 required.

19 MEMBER STETKAR: Dan, I want to talk about
20 it later, but this drawing might help me understand a
21 couple of things.

22 Take the tank-drain valve on the left
23 there that you have highlighted as important to safe
24 shutdown. In the Reg Guide, all tank drain valves,
25 regardless of the size, regardless of where the water

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1 goes, seem to be included in the important to safe
2 shutdown category.

3 There is a table in the Reg Guide. And it
4 just says, success path, supply tank, spurious drainer
5 bypass. Suppose that is a 10-inch drain valve that
6 will drain that tank in 45 minutes. Is that still
7 included as only important to safe shutdown?

8 MR. FRUMKIN: The staff felt that it was
9 important to draw a clear line between important to
10 safe shutdown and -- or required for safe shutdown and
11 important to safe shutdown. Now everything that is
12 required for safe shutdown requires that III.G.2
13 protection.

14 MEMBER STETKAR: I understand.

15 MR. FRUMKIN: But when you get to the
16 important to safe shutdown, if it is not feasible to
17 do a manual action, or you can't do a manual action
18 reliably, then the staff interpretation of III.G.1 is
19 that you are required to provide sufficient
20 protection.

21 MEMBER STETKAR: I understand.

22 MR. FRUMKIN: But the protection
23 doesn't --

24 MEMBER STETKAR: Let me get back to my --

25 MR. FRUMKIN: But the protection doesn't

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1 need to be III.G.2 protection.

2 MEMBER STETKAR: I understand.

3 MR. FRUMKIN: Okay.

4 MEMBER STETKAR: I'm not a lawyer, but I
5 understand how that works. My question is, suppose
6 that valve opens spuriously and you drain that tank
7 within 45 minutes. Is that valve an important to safe
8 shutdown valve or a required for safe shutdown valve?

9 MR. FRUMKIN: That valve would be an
10 important to safe shutdown valve that cannot be
11 feasibly and reliably mitigated, and therefore, would
12 need some protection.

13 MEMBER STETKAR: Okay. That gets me to
14 the second part of my question. There seems to be an
15 implicit assumed one hour throughout the Reg Guide.
16 It isn't stated very explicitly anywhere, but it seems
17 to be assumed that, if something can be mitigated by a
18 manual action within one hour, that defines important
19 to safe shutdown rather than required for safe
20 shutdown. Is that true?

21 MR. FRUMKIN: In one case it is, and that
22 is actually on this diagram as well. Along this green
23 box, we put this valve. This is the valve that we
24 need that we use that one-hour analysis for. We don't
25 use the one-hour analysis for anything else. It is

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1 drain valves that are part of the train of systems
2 required for safe shutdown.

3 MEMBER STETKAR: Well, I carefully asked
4 you about that tank-drain valve, and I said 45 minutes
5 to make sure that I understood it was less than one
6 hour. And you said, if there was an action that was
7 reliable and feasible, that that action must be
8 accomplished within 45 minutes now. Then it, indeed,
9 is an important to safe shutdown, not a required for
10 safe shutdown valve.

11 What I need to understand somehow between
12 now and noon is what criteria, implicit or explicit,
13 have been applied throughout this whole process for
14 taking credit for manual actions, and is there an
15 implicit or explicit time window applied to those
16 criteria?

17 So I just wanted to bring this up and let
18 you continue now, but I would like you and NEI, if
19 they are coming up, to clarify that because I really
20 couldn't quite understand that.

21 MR. FRUMKIN: Yes. Well, just before I go
22 on, honestly, if we stay on this picture the whole
23 time, I think we will probably be more productive.

24 (Laughter.)

25 MEMBER STETKAR: It helps.

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1 MR. FRUMKIN: But this drain valve was one
2 of the contentious issues between the staff and the
3 industry because the staff believed that this valve is
4 a required-for-safe-shutdown valve, and the industry
5 felt --

6 MEMBER RAY: Which one are you pointing
7 at?

8 MR. FRUMKIN: Oh, my mouse goes away.
9 Off of the green system.

10 MEMBER RAY: Yes.

11 MR. FRUMKIN: It has been kind of
12 described as a hole in the pipe. We actually had
13 numerous public meetings where we discussed just this
14 issue. Basically, what we came up with is, well, if
15 the hole in the pipe is very tiny, we don't have to
16 worry about it. Well, if it is very big, we do have
17 to worry about it.

18 Rather than leave the licensees with some
19 sort of subjective judgment on that to make, we gave
20 the licensees -- we agreed with the industry that,
21 well, a hole in the pipe that was big enough that
22 would cause a challenge to safe shutdown in an hour,
23 if it were opened, then that is something that would
24 be required to be protected in accordance with
25 III.G.2. If that valve was smaller than that, such as

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1 it would cause a challenge to safe shutdown in more
2 than an hour, then it may still need manual actions or
3 some other means, but it wouldn't require the III.G.2
4 protection.

5 MEMBER STETKAR: But all tank-drain
6 valves, the number one on your -- are, by definition,
7 not required to be protected under III.G.2, as I read
8 the Reg Guide.

9 MR. FRUMKIN: Right, but that does cut
10 both ways. If you have a 10-inch valve on a small
11 tank, and it would drain in two minutes, then you may
12 be required to protect that in accordance with III.G.2
13 or some other protection, such as relocating the cable
14 within the area such that no reasonable fire could hit
15 it, something like that, because there is no feasible
16 or reliable manual actions that could protect that
17 valve.

18 So, in a way, we have sliced this -- the
19 equipment required for safe shutdown or the hot safe
20 shutdown, the systems necessary to achieve and
21 maintain hot shutdown conditions is deterministic,
22 absolutely. If a licensee says, I need that piece of
23 equipment to shut down my plant, we say, you protect
24 that equipment in accordance with III.G.2 or better,
25 or III.G.1 or III.G.3.

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1 But where the licensee is worried that
2 some piece of equipment that's not part of that green
3 box, using that terminology, that could affect the
4 ability to safely shut down, then the licensee is in a
5 much more performance-based stage. They have the
6 ability at that point to use engineering judgment, to
7 use fire modeling, to use manual actions, to justify
8 to the staff or even to themselves and the inspectors,
9 and so forth, that they do not need to go -- that it
10 may or may not need a physical protection or a plant
11 modification.

12 In doing some other work for the --

13 MEMBER RAY: Wait. Before you go to the
14 next slide, why doesn't the green box include the tank
15 and the No. 1 valve over there? Because I thought I
16 understood what John was going after, but we're
17 getting off the track. I just want to ask that
18 question.

19 MR. FRUMKIN: Well, because, as you can
20 see, the tank feeds a number of things. The tank
21 feeds, at least in this one, it feeds the orange box
22 or the orange oval pump system up here.

23 MEMBER RAY: Yes, but that doesn't seem
24 like a sufficient reason. Just listening to your
25 words, I would make the green box include the tank and

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1 the number one valve, just listening to what you said.

2 MR. FRUMKIN: Right, and you could make a
3 good argument for that. I'm not arguing. There was a
4 lot of positions, people, on one side or another that
5 said, okay, well, the tanks should be included, the
6 tanks shouldn't be included, and so forth. Well, we
7 had to draw the line somewhere, and we also wanted to
8 draw the line somewhere that was defensible and fairly
9 easy to understand.

10 Now you think that it should be in, but if
11 I said it wasn't, and that we could protect that
12 number one valve somehow, you would at least have an
13 understanding of what was the requirement. Because
14 our goal here is to assure safety and, as the
15 Commission directed us -- with my little wheel mouse
16 -- you know, a functional approach. They also wanted
17 us to do -- I thought the word clear was in
18 here -- clearly-defined method of compliance.

19 So, although this approach, I guess,
20 wouldn't make everybody happy, it is clear, I believe,
21 at least the way we have set it up, and I believe that
22 it sufficiently provides for safety. Also, I guess my
23 point that I was going to make was, when you go back
24 and you look at the original inspections of the plants
25 that the inspectors did from headquarters back in the

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1 eighties and late seventies, they very consistently
2 said, well, if it is a piece of equipment that could
3 adversely affect safe shutdown, then you can do manual
4 actions. If it was a piece of equipment that was
5 required for safe shutdown, you couldn't do manual
6 actions.

7 So this dichotomy, this separation of the
8 two types of equipment has always been in the
9 regulatory framework. Now what we are doing is we are
10 documenting it.

11 MEMBER RAY: Well, all right, I'll quit
12 here at this moment, but all of what you said still
13 doesn't explain why the one drain valve is in the
14 green box and the other one isn't, which was what John
15 was asking to begin with. So let's just leave it
16 there.

17 I understand you have to make decisions,
18 but, still, I am trying to comprehend the difference
19 from a practical standpoint between what is required
20 and what is important, what is green and what is
21 orange.

22 MR. FRUMKIN: I guess this gets down to
23 the point of, well, what if it is a drain valve -- the
24 drain valve that's in the box, okay, we had to set up
25 because the staff believed that that was a hole in the

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1 pipe. Okay, so let's protect that under that one-hour
2 criteria that we came up with.

3 Well, what if this is 10 hours? What if
4 it causes a challenge to safe shutdown in 20 hours or
5 50 hours? Is it going to be required to have
6 protection? The staff couldn't justify that.

7 Now if it is going to provide a challenge
8 in 45 minutes, maybe it is going to be required to
9 have protection, but from a performance-based
10 standpoint, what we wanted to avoid was unnecessary
11 plant modifications and also unnecessary exemptions
12 for things that didn't have a real safety
13 significance. We felt that in the green box these
14 items really almost always have safety significance.
15 Once we get outside of the green box, my impression is
16 that the rule always intended to have some
17 performance-based capabilities for the licensees.

18 MEMBER STETKAR: Dan, I hate to belabor
19 it, but I will. The bypass valve, the green valve in
20 the discharge path, you've said is included as
21 required for safe shutdown if it's large enough to
22 effectively disable the function within an hour.

23 When you just recently described the tank-
24 drain valve, you said, well, if that tank-drain valve
25 drains the tank in 45 minutes, it may be -- you used

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1 the word may be -- it may be a necessity to protect it
2 or performance-based actions may be justified to keep
3 it as important to safe shutdown.

4 Well, that seems to insert a note of
5 confusion when I apply the regulations because may be
6 in 45 minutes is not the same as shall in one hour.
7 So I just leave that and let you continue.

8 MEMBER RAY: I think you are saying the
9 same thing that I'm trying to say, taking it from a
10 slightly different point of view. But I think I hear
11 what you are saying about the need to be arbitrary,
12 which is the way I would describe it.

13 MR. FRUMKIN: To not respond directly to
14 your comment, but this concept, it is unfortunate that
15 we are talking about this concept now for the first
16 time because this concept, obviously, has been around
17 for a year or two. It is not immediately clear,
18 perhaps because of my inability to express it, but
19 when it gets a chance to sink in, the staff's position
20 is that it is a safe concept; it is a clear concept;
21 it is an enforceable concept, and that's our goal at
22 the end of the day.

23 So, as I have been discussing, there's two
24 categories of equipment for fire safe shutdown. One
25 is described as the safe shutdown success path. Also,

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1 as you heard me describe it as the green box or
2 components required for hot shutdown.

3 The reason that there's all of these
4 different names is the component required for hot
5 shutdown, that is words from the rule, but the Reg
6 Guide uses safe shutdown success path components. So
7 that's why there's two different words that are kind
8 of used interchangeably.

9 Then there's also the important to safe
10 shutdown components, also the orange box. These are
11 the components that you may use performance-based
12 tools to evaluate.

13 Although both require protection, only the
14 safe shutdown success path components, orange box, or
15 hot shutdown components require the III.G.2-type
16 protection of barrier separation, suppression, et
17 cetera.

18 Now I will talk here a little bit about
19 the changes to the Draft Reg Guide or the changes that
20 are included in the Reg Guide and also I will discuss
21 a little bit about the performance-based tools that
22 are available for the components important to safe
23 shutdown.

24 The main changes to the Regulatory Guide
25 were Regulatory Position C.5, which was the safe

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1 shutdown section.

2 First and foremost, we created this
3 distinction between the safe shutdown success path
4 components and the components important to safety.

5 For those components important to safety,
6 we described specifically in the Reg Guide that
7 feasible and reliable manual actions may be used where
8 they can assure safe shutdown. Also, there's a
9 section which describes the use of fire modeling to
10 assess components that are important to safe shutdown.

11 So, if we get back to our picture for a
12 minute, and let's say we are in a very large room, a
13 reactor building, or something, where I would have a
14 fire that would require this valve, I'm sorry, require
15 the tank, but also could affect this number one valve.

16 Well, then I've got to start doing maybe some timing,
17 some analysis, or so forth.

18 But if I'm in an area of the plant that
19 just requires this valve, or I'm sorry, that could
20 just affect this valve, but doesn't require the tank,
21 perhaps there's other tanks that are out there that
22 are going to be used for safe shutdown or perhaps
23 there won't be an effect on even a plant trip or plant
24 transient at all; then fire modeling may be sufficient
25 to demonstrate that this valve having spurious

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1 actuation will not be an adverse effect to safe
2 shutdown.

3 So that is how fire modeling could work,
4 where because you have to have the transient that
5 causes you to need your safe shutdown equipment, and
6 then you figure out the equipment that could affect
7 the safe shutdown. Well, if the transient requires
8 safe shutdown equipment on a different train, then
9 your spurious actuations, and there would be no
10 effect, then fire modeling may be sufficient to
11 demonstrate that you don't need any protection.

12 This was a major point from the licensees,
13 is that they were concerned that, well, if we just
14 allow manual actions, we will triple our size of our
15 procedures, putting in dozens and dozens of manual
16 actions to mitigate things that aren't real. That
17 would be adverse to safety because now the procedures
18 would be unwieldy.

19 This resonated with the staff, that, yes,
20 unless this is a real effect, you don't need to -- if
21 it is a real effect, you need to mitigate it. But if
22 it's not a real effect, if there's no credible fire
23 scenario that could cause the problem, you could
24 evaluate that, document that there's no credible fire,
25 and the licensee would have that performance-based

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1 analysis in their back pocket for inspection.

2 I'm saying, performance-based a lot. I'm
3 not saying, risk-informed performance-based. This is
4 not a risk analysis with entry conditions on fire
5 frequency, and so forth. This is purely a
6 performance-based analysis. We used to call them
7 deterministic analysis. It is that kind of analysis.

8 MEMBER STETKAR: Dan, if you use fire
9 models, how do you account for the uncertainties in
10 both the fire models and the supporting data and all
11 of that? I didn't see any requirement in this
12 document to do that.

13 MR. FRUMKIN: Right, and that gets to
14 these deterministic analyses that we've always
15 allowed. A licensee could have a 4-inch brick wall
16 that wasn't three-hour rated, and they could say,
17 well, we did an analysis of the wall, and basically,
18 the types of fires that we are expecting, we think
19 that the wall is going to survive.

20 We don't require any kind of uncertainty
21 analysis for that type of analysis. So it is much
22 more, when we start trying to quantify things, then I
23 think we are getting much more into the risk-informed
24 performance-based area, which requires NRC oversight,
25 and so forth.

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1 MEMBER STETKAR: You are using the fire
2 models, as I understand it, to quantify available time
3 windows for operator actions, which are then used to
4 justify the fact that those actions are, indeed,
5 reliable and feasible. So, indeed, you are using
6 those fire models to perform a quantification.

7 MR. FRUMKIN: Actually, though, if
8 that's --

9 MEMBER STETKAR: It is not a reliability
10 quantification, but a quantification. It is
11 quantifying a time.

12 MR. FRUMKIN: Well, the intent, and I will
13 have to take a look at the way the fire modeling was
14 written up, but the intent of the fire modeling was to
15 exclude the two pieces of equipment being damaged. It
16 wasn't a timing issue to say, well, now you have five
17 minutes or ten minutes or twenty minutes or an hour.
18 It was to say there's no credible fire scenarios that
19 would damage A and B. Therefore, you don't need to.

20 Now there is some uncertainty in
21 developing that, but I think that the inspectors and
22 the licensees and the staff have a sufficient
23 understanding of the limitations of the fire models to
24 have a high level of confidence that, if they can't
25 come up with a scenario, there is no scenario.

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1 MEMBER STETKAR: You may want to look at
2 that, make a note of it, because the Reg Guide simply
3 endorses NEI 00-01, Appendix H. In that appendix, it
4 says, fire modeling, however, may be used to determine
5 the amount of time required to open any subsequent
6 valves for cases involving need-to-open series valves
7 to cause flow diversion. So Appendix H does talk
8 about using fire models to develop what I call time
9 windows for operator actions.

10 MR. FRUMKIN: Right, okay. Yes, that's
11 helpful.

12 Yes, the Reg Guide doesn't talk about time
13 windows. So if that is in conflict with the Reg
14 Guide, we may have to do it, but that was not the
15 intent of --

16 MEMBER STETKAR: Okay. You were just
17 looking at a strictly heat-release rate and the fact
18 that you have the --

19 CHAIR SIEBER: Well, we have the
20 separation criteria. It either fails or it does not.

21 MEMBER STETKAR: Yes.

22 CHAIR SIEBER: On the other hand, the fire
23 models actually will give you a time profile.

24 MEMBER STETKAR: They will, and the
25 implication of Appendix H in NEI 00-01 is that you can

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1 use them, you can use that time profile as
2 justification for manual actions to place a piece of
3 equipment or a set of spurious signals, is what we are
4 talking about, in one category or another.

5 MR. FRUMKIN: Because we are in a
6 performance-based type of environment, that may be
7 appropriate, but I believe the licensee is going to
8 have a lot more complex analysis and there's going to
9 have to be a lot more rigor on their part.

10 One of the advantages we have by flying a
11 performance-based fire modeling in this case is that
12 our friends from this afternoon who are NFPA 805 are
13 going to be training up our inspectors on fire
14 modeling and risk analysis, and all of those type of
15 things. So the inspectors are going to be much more
16 competent and qualified or at least trained and
17 prepared to do this kind of analysis.

18 CHAIR SIEBER: Well, this whole factor
19 requires an examination of the modeling itself. I
20 recall the curves that were drawn and the test data
21 that was included in that, so that the curve that was
22 basically an envelope over all the failures, and the
23 failures occurred at more severe conditions, and
24 deterministic analysis for that and analysis of
25 uncertainty has to bound within a reasonable range --

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1 what? -- 95 percent confidence, what is expected to
2 occur.

3 So I think that is another way to look at
4 it, is to examine the approved fire modeling and the
5 fire modeling tools to see that they reasonably bound
6 the phenomenon that is involved and then compare that
7 to the licensee's use of the tool or the
8 authentication of the tool situations he does use. So
9 I think that is one of the important factors that
10 comes out of this discussion.

11 MR. FRUMKIN: And the tools, the fire-
12 modeling tools are being validated, or have been
13 validated, by the Office of Research. They are
14 currently working on a fire modeling users' guide, so
15 there will be consistent application in the industry
16 and by the staff. So we are confident -- we might be
17 better, we will certainly be better in 10 years on
18 quantifying/describing fire models and how they should
19 be used in the plant. But the staff is confident now
20 that the state of the art is sufficient to use this
21 for this equipment important to safe shutdown.

22 CHAIR SIEBER: Well, the NRC developed,
23 through the Office of Research, a set of fire-modeling
24 tools, but I don't think that the licensees are
25 required to use those tools exactly.

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1 MR. FRUMKIN: That's right. There's
2 three -- there's actually a few international tools
3 that are available. We have a member of our fire-
4 modeling community in the audience here. But there's
5 some international tools.

6 The NRC has developed a tool. I think it
7 is NUREG-1805. The National Institutes of Standards
8 and Technology, NIST, has a field-based modeling tool,
9 the FDS model, and a zone-based CFAST model, all of
10 which have been validated and verified as part of the
11 NFPA 805 program, and the limitations are discussed in
12 that document.

13 So another major change to the document
14 was this table that was referred to earlier, which
15 provides examples of safe shutdown success path
16 components and components important to safe shutdown.

17 So that table I think is a valuable slice between
18 what is required for hot shutdown or what requires
19 III.G.2 protection and what can be used for this
20 performance-based-type analysis.

21 MEMBER STETKAR: One last one on that
22 table, then I'll be quiet because I know you want to
23 get to the comments segment.

24 In the table, under important to safe
25 shutdown, there's just a blanket statement that says,

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1 HVAC systems and components required to provide
2 cooling to success path components to the extent that
3 cooling is required for post-safe shutdown.

4 Have you thought very much about new
5 reactors? This will apply, Reg Guide 1.189 will apply
6 to new reactors in addition to the existing fleet, is
7 that correct?

8 MR. FRUMKIN: Yes.

9 MEMBER STETKAR: The new reactors are
10 going to use an awful lot of digital instrumentation
11 and control systems that tend to be more susceptible
12 to room heat-up considerations in safety-related
13 systems.

14 I was just curious whether that blanket
15 statement that HVAC, by definition, was always only
16 important to safe shutdown, rather than required to
17 safe shutdown, was sensitive to perhaps some
18 vulnerabilities in new reactors that we may not have
19 in the existing fleet that relies more on analog
20 systems that are somewhat less susceptible to room
21 heat-up concerns.

22 MR. FRUMKIN: Well, in a way, this
23 clarification is very applicable to the old plants,
24 but shouldn't be used that much with the new plants.
25 The reason is because the new plants are going to be

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1 designed with separation, absolute separation, between
2 trains, in accordance with III.G.1, and so forth.

3 So, if there's a plant that has a
4 capability of requiring the HVAC system, a fire in the
5 plant that could both require the HVAC system and
6 cause some transient, or affect the HVAC system and
7 the transient, I mean that should be established in
8 the design, that those things should be provided with
9 sufficient separation.

10 MEMBER STETKAR: So you're essentially
11 relying on the expected design of the new reactors to
12 obviate the need for many of the requirements in this
13 Reg Guide, is that right?

14 MR. FRUMKIN: To obviate the need for many
15 of the performance-based-type analyses.

16 MEMBER STETKAR: Okay.

17 MR. FRUMKIN: Now the types of things and
18 the equipment required for hot shutdown are probably
19 going to be analyzed or have been analyzed by our
20 friends in New Reactors. But, rather than say, well,
21 they've got to be 20 feet apart with suppressions,
22 they are going to be on the opposite side of robust
23 concrete walls.

24 Again, you are bringing up points that we
25 have had conversations with the inspectors, and they

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1 say, well, what if this, what if that? And when we
2 really try to pull real examples out, what we find is
3 the things that we put as important to safe shutdown,
4 really it is very hard to find examples that will
5 affect safe shutdown. And for required for safe
6 shutdown, it is very easy.

7 Now there's always going to be some
8 crossovers. So, with the equipment that is required
9 for hot shutdown that isn't really safety-significant,
10 we still have the exemption process. But, at least in
11 my experience, at least talking to the industry, I
12 wouldn't be expecting exemptions on that. Those
13 things have already been protected quite robustly or
14 exemptions have already been submitted.

15 Then in the required for the safe
16 shutdown, I do believe -- I'm sorry -- for the
17 important to safe shutdown, my understanding with
18 talking to the industry is there is going to be some
19 equipment that is going to either require manual
20 actions, change in plant design of some sort, in order
21 to be able to assure safe shutdown.

22 Now the classic example that I know about,
23 and every time I talk to the industry folks, I'm like,
24 give me more examples, and they can't give me more
25 examples or they haven't given me more examples.

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1 There was this assumption of a single
2 spurious. So you have two valves in series. I will
3 go back to my picture. Two valves in series under 3,
4 where if the top valve were to have a spurious
5 actuation, well, then the second valve would be
6 assumed not to have a spurious actuation.

7 That is no longer -- this paradigm or this
8 clarification also cuts the other way. If it is
9 credible that both of these valves could be affected
10 by the same fire, then the licensees are going to need
11 to consider these valves in their analysis and be able
12 to demonstrate that they can sufficiently protect safe
13 shutdown.

14 My understanding is that some licensees
15 relied on a single spurious analysis to not look at
16 both of those valves. I believe that they are going
17 to have to go back and look at those, and there's
18 going to be some plant modifications to assure safe
19 shutdown. I don't have any plant names, but this is
20 just my gut feeling.

21 For the most part, though, this
22 clarification that you see on this diagram is very
23 consistent with what most licensees have done.
24 Licensees who didn't do this, there are some licensees
25 who have no fire barriers in their plant, some

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1 licensees who haven't done a lot of fire protection at
2 all. Those licensees have gone to NFPA 805. They
3 realize that even to do a paradigm like this would be
4 much more complicated than they could handle.

5 So, if we didn't have 805 and plants going
6 to that, I think there would be a lot more discussion
7 between some of the licensees and the NRC staff. But
8 because the licensees who have perhaps the programs
9 that need the most work, because they are going to
10 NFPA 805, they are not in the pool of the people we
11 are having our discussions with.

12 MEMBER RAY: Let me make an observation
13 and see if you have any comment on it. It looks to me
14 like one of the problems we have, I think, looking at
15 it as we do, there is no difference between required
16 and important other than the ones that are in the
17 required category are part of the success path by
18 definition.

19 In other words, it has to do not with the
20 outcome or the consequences, but it has to do with the
21 location of the item in question, period. That is
22 what I meant by being arbitrary, because we tend to
23 look at things in terms of outcomes, and there isn't
24 any difference, I claim, based on all I have seen and
25 what you have said, between required and important

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1 other than where the thing is located. If it is
2 located in the success path, then it is required.

3 MR. FRUMKIN: Right, and that argument --

4 MEMBER RAY: Can we stop there? I mean,
5 if that is a correct understanding, it helps me.

6 MR. FRUMKIN: Yes.

7 MEMBER RAY: I'm okay with it, and we can
8 move on. All right.

9 MR. FRUMKIN: Yes.

10 MEMBER RAY: Now go ahead and say whatever
11 you want.

12 (Laughter.)

13 MR. FRUMKIN: And that arbitrary
14 designation --

15 MEMBER RAY: You don't know how many hours
16 I have been spent trying to unravel that, until we
17 finally got here to this picture.

18 MR. FRUMKIN: Not hours, years.

19 (Laughter.)

20 That arbitrary designation is written in
21 the rule. That is how the rule was written.

22 MEMBER RAY: Well, that's a matter of
23 opinion, but we shouldn't debate that here.

24 MR. FRUMKIN: The current staff opinion,
25 as through our Office of General Counsel's no legal

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1 objection process --

2 MEMBER RAY: Okay.

3 MR. FRUMKIN: -- agrees with that
4 interpretation of the rule, which is just as you
5 described.

6 MEMBER RAY: Thank you. I am much better
7 off now.

8 (Laughter.)

9 CHAIR SIEBER: You think.

10 MEMBER RAY: Well, I couldn't make any
11 sense out of it for a long time.

12 CHAIR SIEBER: Right.

13 MR. FRUMKIN: Probably the 85 revisions of
14 the original SECY may have had those exact words at
15 one point.

16 MEMBER RAY: Okay.

17 MR. FRUMKIN: So, if we don't have
18 specific comments on this diagram, I will get to the
19 public comments that we have received.

20 We had three industry stakeholders provide
21 public comments. The Nuclear Energy Institute
22 provided comments on behalf of, likely, most of the
23 NRC licensees. Then we had public comments from
24 Dominion, and I think it was Florida Power and Light.
25 Florida Power, I think some of their comments were to

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1 pull in the NEI comments. Actually, Dominion had some
2 other comments that were unrelated.

3 Many of the comments were editorial in
4 nature, and in the view of the NRC staff improved the
5 document, and therefore, were incorporated. These
6 comments related to many of the chapters other than
7 Section C.5. Probably only about half of them
8 addressed Section C.5, and there was information about
9 fire breaks in cable trays that is not currently part
10 of the NRC process, but we still have a paragraph
11 describing how to put them in, but they are not in the
12 regulatory framework. So that is just one example of
13 one of the ones that we included. But, for the most
14 part, we included those editorial improvement-type
15 comments.

16 A significant comment was that the
17 industry stakeholders commented that NEI 00-01, Rev 2,
18 should be referenced in the Guide, and this comment
19 was consistent with the Commission direction, as I
20 described in the slides before.

21 Also, what we did is we had numerous
22 conversations with NEI on their Revision 2. We saw
23 Revision 2B. We commented on it. We gave it back to
24 the industry, or maybe that was Revision 2C. We had a
25 number of public meetings describing the issues on

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1 this NEI 00-01, which we describe as the Industry
2 Implementation Guide.

3 Because it was consistent with Commission
4 direction to consider the Guide, and also consistent
5 with our positions, there was no reason not to endorse
6 it to the extent that we did.

7 CHAIR SIEBER: Overall, you had, from NEI,
8 you had 83 comments. You accepted 54 of those carte
9 blanche, which were basically editorial. You accepted
10 in concept six of them. Twenty-seven you decided you
11 didn't need a change, but one of them was rejected.
12 And the same thing with Florida Power and Light, a lot
13 of those were basically duplicates of NEI's, but you
14 rejected one of those.

15 Make sure that in your discussion you talk
16 about the two that were rejected.

17 MR. FRUMKIN: Right. I will just jump to
18 this slide here. This is slide number 11. This is
19 numerous other comments that were considered and were
20 accepted. But the ones that weren't accepted, the
21 bulk of the editorial ones, they addressed things
22 like, the Guide does not supersede a plant's fire
23 protection program.

24 There was comments that said, please tell
25 us, please provide us, the licensees, some confidence

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1 that the current fire protection program isn't going
2 to be superseded by this, or the approved fire
3 protection program isn't going to be superseded by
4 this Guide.

5 So a number of the non-acceptances related
6 to that one. Some of the non-acceptances related to
7 the fact that the information was located elsewhere in
8 the Guide, and the other one, the other majority of
9 the non-acceptance ones were there were means
10 available to deviate from guidance in the Guide
11 written in the Guide. So we didn't need to add more
12 discussion along those points. So those are the
13 general ones.

14 I hope that I am going to pick up the ones
15 that we are not accepting, these three public comments
16 that were not incorporated, these next slides, 8
17 through 10.

18 One of the comments that wasn't
19 incorporated was the request for the endorsement of
20 Appendix E of NEI 00-01 which was an industry
21 implementation guide for operator manual actions. The
22 reason that we are not endorsing that section is,
23 although we did have numerous discussions with the
24 licensees about NEI 00-01, whether it was a
25 miscommunication or just a disagreement, there was one

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1 significant comment that they did not incorporate into
2 their document, which was an assumption that there
3 will always be 10 minutes to do a manual action.
4 There was no justification; at least in the opinion of
5 the staff, we didn't have sufficient justification to
6 endorse that type of thing.

7 And secondly --

8 MEMBER RAY: Endorse that type of thing?

9 MR. FRUMKIN: Endorse a 10-minute -- you
10 always have 10 minutes to do a manual action
11 assumption. That's what I mean by type of thing.

12 MEMBER RAY: You always will have or you
13 need to assume --

14 CHAIR SIEBER: You will always need.

15 MR. FRUMKIN: No, no. We cannot, we
16 won't, we are not prepared to endorse that there will
17 always be 10 minutes available to do a manual action.

18 CHAIR SIEBER: Okay.

19 MEMBER RAY: Of course.

20 CHAIR SIEBER: That's right.

21 MR. FRUMKIN: Okay. Then that was part of
22 the assumptions of that Appendix E. Then there was
23 also a lack of clear discussion on the reliability of
24 manual actions. In the opinion of the staff, there
25 was some good, useful information there, but it wasn't

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1 as sufficiently clear as we would have liked to see in
2 order to endorse.

3 Probably one of the issues with, not
4 really an issue, Appendix E wasn't in the previous
5 revision of NEI 00-01, so it hasn't been vetted
6 through the staff, through each of the various
7 revisions. This is only the first time we have looked
8 at it, and I don't know that the staff was really even
9 considering incorporation of it when we looked at it.

10 So it may not have gotten the view, the level of
11 scrutiny that it needed to be endorsed.

12 Our path forward for this is we do have a
13 NUREG series document, NUREG-1852, which provides
14 useful information for evaluating post-fire operator
15 manual actions. Again, that is an NRC document, but
16 what we have seen through about 11 exemptions for
17 manual actions that we received on the docket is
18 licensees do understand that; they do understand how
19 to apply it. It is a fairly clear document.

20 So we are confident that in the interim,
21 before we can endorse some industry implementation
22 guidance, that that is an effective fallback position.

23 Additional information has been added to
24 the Guide regarding manual actions. We did add some
25 information about manual actions to the equipment

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1 important to safe shutdown and how that can be
2 applied, and fire modeling may be used to demonstrate
3 that a manual action is not necessary to mitigate
4 spurious actuations for equipment important to safe
5 shutdown.

6 So this is another tool, fire modeling is
7 a tool that may be able to justify the exclusion of a
8 manual action in some cases. The bottom line is that,
9 my bottom line is that industry implementation
10 guidance is good. We will work with the industry on
11 this manual actions implementation guidance if it
12 continues to be important to them, but we have enough
13 information on manual actions in the Guide for
14 licensees to move forward with this clarification.

15 The second comment was a discussion of a
16 20-minute duration of direct current hot shorts.
17 Basically, the NEI 00-01 said that all hot shorts would
18 self-short to ground or not be hot shorts anymore
19 after 20 minutes.

20 CHAIR SIEBER: They would clear.

21 MR. FRUMKIN: I'm sorry?

22 CHAIR SIEBER: They could clear.

23 MR. FRUMKIN: They would clear. That's
24 the word.

25 CHAIR SIEBER: Yes. Okay.

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1 MR. FRUMKIN: They would clear within 20
2 minutes.

3 The reason for not incorporating this is
4 actually based on the testing that some of the
5 industry stakeholders have done. Duke Energy did some
6 testing on DC circuits, and the NRC is in the midst of
7 doing some testing on DC circuits. Although the AC
8 circuits tend to fail very quickly, in a matter of a
9 minute or two, or a millisecond or two, up to a minute
10 or two, the DC circuits are not showing the same kind
11 of failure times.

12 I believe that in the current testing they
13 have had a DC circuit that locked in for 15 minutes
14 before it cleared. And that was one of two tests that
15 tested DC circuits.

16 CHAIR SIEBER: And what causes that, the
17 resistance in the junction area; it defaults?

18 MR. FRUMKIN: I'll have my test expert
19 provide some insights on that.

20 MR. BARRETT: This is Harry Barrett from
21 the Fire Protection Branch in NRR.

22 What differentiates DC from AC is two
23 different things. One of them really has nothing to
24 do with whether it is AC or DC. One of them has to do
25 with fire intensity. If you end up having a slow-

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1 growing fire or a very slow heatup of the component,
2 you can end up having an extended duration, just
3 because the length of time that it takes for it to
4 continue to fail to the point where it shorts to
5 ground ends up being lengthened because the heat
6 transfer process is essentially stagnant, and it just
7 sits there.

8 The other item --

9 CHAIR SIEBER: Why is that unique for DC
10 as --

11 MR. BARRETT: It's not. That particular
12 part is not unique to DC. That could be for AC, and
13 it could be for DC; it doesn't matter.

14 And the other thing is that there are some
15 DC circuits that are fused much higher. Some switch
16 gear trip coils may end up having a 35-amp fuse on
17 them. Having a higher fuse rating could end up
18 meaning that you have to have a much better short to
19 ground in order to blow the fuse. We have seen that
20 happen in some of the tests with larger components,
21 like large PORV coils or trip coils and breakers; you
22 can end up having a large enough fuse that you just
23 don't blow the fuse.

24 In the DESIREE fire testing that we
25 observed a couple of weeks ago out in Sandia, we

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1 actually ended up shorting to ground at the tray and
2 vaporized the conductor, but didn't blow the fuse.

3 CHAIR SIEBER: So it does have something
4 to do with the --

5 MR. BARRETT: A hundred and twenty-five
6 volt DC, we had an arcing fault to the point where it
7 actually vaporized the conductors, and we didn't blow
8 the fuse.

9 So some things are unique to DC because of
10 the application the way they are. We may end up
11 seeing that with AC, if you end up having higher
12 current ratings, let's say, in a lighting panel, and
13 you have a 50-amp breaker. Then you might end up
14 having the same kind of phenomenon with that, but it
15 has to do with the fuse sizes, and it also has to do
16 with the amount of heat flux.

17 CHAIR SIEBER: Yes. Well, I can picture
18 AC circuits, for example, pump-start circuits, where
19 you have a provision in the protection scheme to allow
20 high currents during the early part, but that's
21 usually relatively short in duration.

22 MR. BARRETT: Right, right.

23 CHAIR SIEBER: Okay. That answers my
24 question. Thank you.

25 MR. FRUMKIN: Well, our folks from

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1 Research, when this is done, I am sure they will be
2 very happy to come in and bring in burnt cables and
3 show videos and --

4 CHAIR SIEBER: We already did that.

5 MR. FRUMKIN: -- regale you. Well, but
6 this is a whole new testing. So you will get it all
7 again.

8 CHAIR SIEBER: The same cables, new tests.

9 MR. FRUMKIN: That's right.

10 (Laughter.)

11 CHAIR SIEBER: Okay.

12 MR. FRUMKIN: But the bottom line, I guess
13 the point is the testing is not bearing out that DC
14 circuits can be assumed to clear within 20 minutes.

15 Now, based on the body of testing, we are
16 confident that AC circuits will clear in 20 minutes,
17 and we plan to endorse that again.

18 Then, where for DC circuits there's also
19 other options available, where these hot shorts could
20 affect safe shutdown, such as manual actions, fire
21 modeling to assure that what needs to be damaged to
22 cause the transient and what needs to be damaged to
23 mitigate the transient aren't affected by the same
24 fire. So there are tools out there.

25 But, in the judgment of the staff, this is

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1 a real issue that cannot be handled with a simple
2 assumption. This is going to take some work on the
3 part of the licensees to demonstrate their ability to
4 safely shut down.

5 CHAIR SIEBER: Yes. To me, the difference
6 between DC and AC continues to be sort of arbitrary,
7 and I guess if you want to distinguish between, you
8 would say DC circuits take longer to fail, as opposed
9 to looking at the fusing or interruption capability.
10 To me, it stretches it a little bit.

11 MR. BARRETT: Yes, there's several factors
12 you have to consider there. It is not just the fact
13 that it is DC or AC.

14 CHAIR SIEBER: Right.

15 MR. BARRETT: It is not a simple
16 phenomena.

17 CHAIR SIEBER: But I would think that if a
18 licensee wanted to take exception, you would require a
19 detailed analysis, including the protection scheme and
20 the setpoints or limitations that were there.

21 Okay, thank you. That answers my
22 question.

23 MR. FRUMKIN: So the third major area of
24 non-incorporation -- I think I made that term up --
25 has to do with concurrent hot shorts for components

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1 important to safe shutdown.

2 I will add that these issues that we have
3 are not in the required for safe shutdown. There's a
4 strong parity between the staff and the industry that
5 those equipment required for safe shutdown in that
6 green box is required protection, according to III.G.2
7 or exemption. That's not where these issues are
8 coming up. These issues are coming up in the
9 application of the orange box or the equipment
10 important to safe shutdown.

11 So what we found, just the staff
12 interpretation of the application of this concurrent
13 hot shorts issue, is that they are trying to set
14 limits on the consideration of concurrent hot shorts.

15 The staff's position is that that is risk-informed;
16 they are using risk-informed assumptions, which is
17 perfectly acceptable to the staff, except it needs to
18 come in or it is the staff expectation that risk
19 options come in under Reg Guide 1.174. Other options,
20 such as manual actions and fire modeling, are also
21 available.

22 CHAIR SIEBER: Okay. So this is really
23 not a technical issue? It is a how-to-apply-the-rules
24 issue?

25 MR. FRUMKIN: Yes, that's the staff's

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1 position, and I think it gives me some satisfaction to
2 know that we do have these tools out there that aren't
3 going to require licensees to do drastic modifications
4 of their plants and spend lots of money. As they have
5 described to me, these systems have been in operation
6 for as long as 40 years. To modify them physically to
7 avoid this would create a new system that may be
8 subject to new failure modes that weren't being
9 considered.

10 So we have risk tools available that would
11 come into the NRC for review. Also, there's manual
12 actions and fire modeling which they could do their
13 own analysis and keep that in-house for subject to
14 inspection.

15 CHAIR SIEBER: Okay.

16 MR. FRUMKIN: This is a summary of the
17 public comments. In the view of the staff, there is
18 sufficient guidance and alternatives available for
19 licensees to complete fire-induced circuit analysis,
20 including multiple spurious actuations. There's a
21 variety of methods available that would allow
22 licensees to avoid modifications to resolve non-
23 safety-significant circuit analysis issues.

24 For licensees that cannot resolve these
25 issues technically without the risk options, NFPA 805

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1 is also available. Obviously, that is a more costly
2 approach because it takes in the entire plant, but,
3 again, it doesn't introduce modifications that aren't
4 necessary.

5 Lastly, the NRC staff will continue to
6 work with the industry in refining this implementation
7 guidance for the open issues, but I'll just repeat my
8 mantra, that this refinement is not necessary to
9 fulfill the Commission's direction regarding clearly-
10 defined method of compliance. In the staff's
11 judgment, we have met all of the goals of the
12 Commission in bringing this to closure, providing
13 clearly-defined method of compliance, using the public
14 process of issuing the Reg Guide, numerous public
15 meetings with industry stakeholders. We did have some
16 public participation in some early meetings, and we
17 feel like we've met their intent.

18 That takes me to my last slide, that our
19 goal is to issue the final Regulatory Guide 1.189
20 before the end of the fourth quarter of 2009. The
21 issuance of the Reg Guide will start the clock on
22 Enforcement Guidance Memorandum EGM 09-002, which will
23 give licensees six months to identify non-compliances,
24 and then it will give them another 30 months to
25 resolve those non-compliances.

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1 So licensees who identify non-compliances
2 during that period will not be subject to
3 enforcement, and that is really the goal of the
4 enforcement discretion, is to give the licensees a
5 window to look for things, without looking and then
6 getting hit with a violation.

7 Then, really, at the end of six months
8 following the issuance of the Reg Guide 1.189, the
9 enforcement discretion will end for all issues that
10 haven't been identified. So the inspections will
11 begin at that point. Obviously, some items will be
12 identified in the corrective action system, but that,
13 again, is something for the inspectors to inspect.

14 I misspoke. Currently, there are
15 inspections going on in this area, but there's also
16 currently a more broad inspection Enforcement Guidance
17 Memorandum out there that covers all-circuit findings
18 for multiple spurious. So that is being inspected,
19 but these are all being put through with the
20 Enforcement Guidance Memorandum, and not receiving
21 cited violations.

22 Then the NRC will revise its inspection
23 manual to assure that licensees are appropriately
24 implementing the clarification, as described in this
25 Reg Guide.

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1 And that's all I have.

2 CHAIR SIEBER: Okay. I would like to ask
3 the members, before we take a break, if they have
4 additional questions on the staff's presentation.

5 MR. WEERAKKODY: Jack, this is Sunil
6 Weerakkody, NRC. I just want to make a couple of
7 comments for the information of the Committee.

8 I took a couple of notes in terms of
9 things that I want to speak to Dan and, if necessary,
10 with New Reactors.

11 One is with respect to the questions on
12 fire modeling. We have the other track, 805, in
13 there. We are very clear with respect to the training
14 requirements, the knowledge levels for people who use
15 fire models.

16 I am going to talk to Dan later and make
17 sure that we have parity because fundamentally, if a
18 licensee uses fire models, they should be subject to
19 the same standards. So that is a take-back for us.
20 We may have done it; we may not, but I want to explore
21 that.

22 The second thing is with respect to John's
23 questions on HVAC and the important to safety, we have
24 been meeting, Dan has been meeting with NEI and other
25 public interested stakeholders in terms of determining

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1 drafting for this with respect to required or
2 important to safety.

3 We have a couple of members from NRO here,
4 the New Reactors organization here, but I'm going to
5 bring that question that John raised back to their
6 attention, especially in light of what you said about
7 the digital and the nature that they have thought
8 through that.

9 MEMBER STETKAR: Also, there are some
10 plants, existing plants, that are proposing to replace
11 their safety-related protection control systems, their
12 current analog systems with digital systems. So there
13 may be some subset of the currently operating fleet
14 that falls into that regime of susceptibility also.

15 MR. WEERAKKODY: All right. Thank you,
16 John.

17 Just to make it very clear, because
18 digital is a whole new area that has been under the
19 NRR, and not open view, I just think I want to take it
20 back and make sure 1.189 has carefully thought through
21 that. I do not know at this point how Office of New
22 Reactors feels about that, but that is something that
23 we need to think about.

24 MEMBER STETKAR: The reason I brought up
25 HVAC is part of the overall theme that I had in terms

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1 of just kind of a general concern about pigeonholing
2 certain types of systems or equipment or functions in
3 a particular category as either required for safe
4 shutdown or important to safe shutdown because of an
5 implicit credit for some type of operator action and
6 some sort of implicit time window available. That is
7 the basic concern.

8 HVAC is an example in terms of
9 susceptibility of digital I&C. Other more mechanical
10 components, like these valves, are other examples and
11 more a mechanical side of the equation.

12 MR. WEERAKKODY: And the last thing I
13 wanted to share with the Committee members is, in
14 fact, I think the need for arbitrariness. You know,
15 all the questions that Dan got initially with respect
16 to our definition or application of the important to
17 safety versus required for safety.

18 I thank the Committee for your patience.
19 Dan had the very hard job to clarify the
20 unclarifiable. If you look at the Commission, you
21 know, as regulators, we wish we could have just said,
22 here's what you need to do. Go do it. But when the
23 Commission said it lacks specific guidance, there was
24 not specific guidance, that put us in a situation
25 where Dan and his team had to meet with the industry,

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1 basically, go with a different plan, different
2 configurations, and come up with something that makes
3 sense.

4 So I appreciate the questions, and I'm
5 glad I wasn't sitting there with Dan. But thank you
6 for your understanding.

7 Like I said at the beginning of the
8 meeting, we firmly believe that the staff has
9 developed enough guidance to meet the Commission's
10 expectations, and we would like this Committee to
11 recommend to the full Committee that this Reg guide be
12 endorsed, so that we can issue it in the fourth
13 quarter.

14 Thank you very much.

15 CHAIR SIEBER: Do members have any
16 questions to ask Dan?

17 I take it you have completed both of your
18 sections that are on the agenda?

19 MR. FRUMKIN: Yes. Yes, I have.

20 CHAIR SIEBER: If we want to ask Dan
21 questions, now is the time.

22 (No response.)

23 MR. FRUMKIN: Well, I will be available
24 after --

25 CHAIR SIEBER: Yes, but you will be

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1 sitting over there, perhaps.

2 Okay, if there are no additional
3 questions, this is an appropriate time to take a
4 break. I would suggest that we try to be back, by
5 that clock there, at quarter after 10:00.

6 (Whereupon, the above-entitled matter went
7 off the record at 9:47 a.m. and resumed at 10:14 a.m.)

8 CHAIR SIEBER: Okay, I think we are ready
9 to begin.

10 At this point in the meeting, we would
11 like to hear from NEI: Tom Gorman and Steve Hutchins.

12 MR. HUTCHINS: Good morning. My name is
13 Steve Hutchins. I'm a loaned employee from Exelon
14 working for NEI as the Project Manager for Fire
15 Protection.

16 I would like to thank the ACRS
17 Subcommittee for this time to share our comments. We
18 gathered industry comments from about 17 different
19 utilities and gathered them and submitted them as one
20 package to the NRC.

21 But I would like to thank the NRC, also,
22 for two years of very positive interaction and
23 meetings, public meetings, over 40 public meetings, to
24 work out the Reg Guide and also NEI 00-01.

25 I want to introduce Tom Gorman. Tom is

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1 our PPL employee who is the Chairman of our Fire-
2 Induced Circuit Failure Task Force and one of the
3 principal authors of NEI 00-01. He is going to review
4 the public comments.

5 Tom?

6 MR. GORMAN: Thank you, Steve.

7 Before we start, I would just like to add
8 that a lot of what we are focusing on here today are
9 the few differences that we have left relative to the
10 criteria, and I believe we have really made a lot of
11 progress on putting together a criteria that the
12 industry will be able to use to put a lot of the
13 debate that we have had for a period of time behind us
14 and to stabilize the regulatory and, from the licensee
15 perspective, the inspection aspects of plant fire
16 protection design.

17 I would also like to just give you a
18 little bit more history. We have been working on this
19 revision of NEI 00-01 for probably two to three years,
20 but there's some history on the issues that we have
21 been discussing in these documents that some would
22 suggest go back 30 years. Others you can go back and
23 you can point at active discussions on specific topics
24 probably 15 to 17 years ago. I know back in November
25 of 2000, some of us were here as representatives of a

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1 BWR Owners Group presenting a paper which was a
2 predecessor of NEI 00-01 that related specifically to
3 the guidance for post-fire safe shutdown. So there is
4 a long history on this stuff.

5 We appear to be converging on a solution
6 to the differences of opinions and to be putting
7 together a criteria that we will be able to apply and,
8 hopefully, will stand the test of time as we go
9 forward.

10 Some of the information on the slides will
11 be almost identical to what you saw with Dan. Some
12 will be slightly different or a couple of differences.

13 Again, we go back in our history to the
14 issuance of Generic Letter 2006-XX. That was
15 rejected. One of the reasons for disapproval was the
16 fact that licensees couldn't really be expected to
17 perform an analysis without a clear regulatory
18 footprint, without clear regulatory guidance on how to
19 do that.

20 As Dan had stated earlier, the
21 endorsement, the encouragement of the Commissioners to
22 work with industry and to come up with a criteria that
23 did meet the requirements for a clearly-defined method
24 for the operating plants was something that we
25 believed was very important also. We were encouraged

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1 by the fact that NRC was requesting that we be
2 involved in that process.

3 Those were words that I think I spoke
4 myself in 1997 at the BWR Owners Group document, where
5 people asked, what would you like out of these
6 meetings, as we formed an Appendix R Committee for the
7 BWR Owners Group. I said I would like a clear design
8 criteria that we can all apply and that we know, when
9 we are done applying it, that we can reference as we
10 get into discussions about what is and what is not a
11 required performance criteria for post-fire safe
12 shutdown. As I said, I think we are converging on
13 that.

14 We have been working with the staff for
15 the last three years. We have had a lot of back and
16 forth. We have made a lot of progress. We won't talk
17 so much about the progress, but we will talk about the
18 differences today.

19 We went back and we revised NEI 00-01 to
20 put in the specific methodology for the resolution of
21 the multiple spurious operations issue. That, I
22 think, is something that you haven't really heard too
23 much about. So that is one of the areas that I think
24 we have good agreement between the staff and the
25 industry, and that is how we are going to address the

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1 issue of multiple spurious operations.

2 We have built in generic lists that were
3 developed by each of the owners groups of the
4 potential combinations of equipment failures that need
5 to be looked at by each one of the licensees. We have
6 also provided provisions for an expert panel process
7 that would review that generic list and would adjust
8 it with additional plant-unique equipment
9 combinations, and in some cases would have the ability
10 to remove certain combinations from the list that were
11 not appropriate to the particular vintage of the plant
12 that was under evaluation. So we have that expert
13 panel process.

14 Then, in the middle of that, we came upon
15 this criteria of required for safe shutdown and
16 important for safe shutdown. So we viewed that as a
17 way to resolve some of the differences of opinion
18 between the industry and the NRC relative to the use
19 of manual operator actions. We have incorporated that
20 into NEI 00-01.

21 MEMBER RAY: Do you agree with what I said
22 earlier, that the difference between required and
23 important is the location of the item, that required
24 is in the success path?

25 MR. GORMAN: I was debating whether we

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1 were going to get back into that issue or not. Since
2 you brought it up, I have a slightly different
3 explanation of --

4 MEMBER RAY: Can you say it like in a
5 sentence or so or --

6 MR. GORMAN: Probably not.

7 MEMBER RAY: -- does it take a paragraph?

8 MR. GORMAN: It really, in our mind, comes
9 down to that single-flow diversion path off of the
10 discharge line on the required system. We initially
11 argued that all flow diversions --

12 MEMBER RAY: On the safe shutdown path?

13 MR. GORMAN: Yes.

14 MEMBER RAY: Right.

15 MR. GORMAN: We initially argued that all
16 flow diversions were important to safe shutdown; they
17 were not required for safe shutdown. The NRC staff
18 was uncomfortable with that position relative to large
19 full-flow-diversion situations. If you had a full-
20 flow diversion where your damage could happen very
21 quickly, they were concerned with allowing operator
22 manual actions for that scenario.

23 We said, well, if it happens very quickly,
24 that is not something where we would be able to
25 justify the use of an operator manual action, and we

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1 would be forced to provide the required protection.

2 To end that debate, what we decided to do
3 is we generated that Appendix H. What we said
4 initially is that all flow diversions off of the safe
5 shutdown path are going to be classified as required.

6 What we attempted to put into Appendix H, and I hope
7 you read it this way, was a criteria to determine
8 whether or not some of those valves could be
9 considered as important.

10 So, for example, if you had a large full-
11 flow flow diversion off the injection path and the
12 required for safe shutdown path, that would not make
13 the cut for important to safe shutdown. That would
14 pretty much stay as required.

15 If you had a small, 2-inch line, a midflow
16 line, for example, for the pump that failed to close,
17 most of the plant systems are designed such that the
18 loss of flow through that midflow can be tolerated.

19 So we proposed the criteria that is in
20 Appendix H where we said, if an analysis, including
21 thermal hydraulic analysis, were to demonstrate that
22 the flow diversion were to cause a problem with
23 respect to safe shutdown within one hour, then you
24 can't consider it for operator manual actions. If it
25 takes more than hour, then you can consider it.

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1 We also said in there that that one hour
2 is a separate criteria from the criteria that we
3 included in Appendix C on Operator Manual Actions for
4 justifying the feasibility and reliability of operator
5 manual actions.

6 Operator manual actions, if they are
7 allowed, need to be justified on a separate criteria
8 that addresses both reliability and feasibility. All
9 we are doing with that one-hour requirement in
10 Appendix H is we are determining whether or not
11 looking at a feasibility and reliability criteria is
12 an option for us.

13 MEMBER RAY: Okay. So you would not
14 include everything on the safe shutdown path as
15 required, provided it met the exclusion that you just
16 outlined --

17 MR. GORMAN: Correct.

18 MEMBER RAY: -- in which case it would
19 then be important, even though it was in the safe
20 shutdown path?

21 MR. GORMAN: As flow diversion, yes.

22 MEMBER RAY: Yes, yes. Okay.

23 MEMBER STETKAR: Tom, in Appendix H
24 there's kind of a categorical statement that says I
25 can screen out any flow diversion paths less than 1-

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1 inch in diameter. What's the basis for that?

2 MR. GORMAN: We can't envision a 1-inch
3 diameter flow diversion giving us a problem with
4 respect to the makeup systems that we have.

5 MEMBER STETKAR: I know you have looked
6 at -- most of the examples in NEI 00-01 come from
7 Boiling Water Reactors.

8 MR. GORMAN: Right.

9 MEMBER STETKAR: Have you thought about,
10 there's a requirement for maintaining level in a
11 Pressurized Water Reactor, and you can take credit --
12 in fact, the only system that you can take credit for
13 is the charging and makeup system. Have you thought
14 about a 1-inch flow diversion from that system?

15 MR. GORMAN: I have not specifically
16 thought about it relative to that.

17 MEMBER STETKAR: They tend to about 2-inch
18 lines.

19 MR. GORMAN: Yes, if it is significant, it
20 would need to be looked at.

21 MEMBER STETKAR: I was curious why the 1-
22 inch categorical exclusion for any plant, any system.

23 MR. GORMAN: Some of that came from
24 previous criteria. As I said, the document is
25 predicated on BWR owners' criteria. We are talking

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1 about systems with --

2 MEMBER STETKAR: A good fraction of the
3 plants that are applying these happened to be
4 Pressurized Water Reactors that actually have slightly
5 different systems.

6 MR. GORMAN: Yes. I would say, if you
7 look at the split between NFPA 805 and the
8 deterministic, I would say the NFPA 805 group of
9 plants is heavily weighted toward the PWRs.

10 MEMBER STETKAR: That's true.

11 MR. GORMAN: The majority of people
12 looking at the deterministic criteria, at least in my
13 view, are still in the BWR category.

14 MEMBER STETKAR: Yes. Still, if I have a
15 Pressurized Water Reactor and I have a charging system
16 that is required to maintain pressurizer level, and I
17 want to use a deterministic criterion, this says I can
18 screen out a 1-inch flow diversion path in that
19 system.

20 MR. GORMAN: Yes.

21 MEMBER STETKAR: I was just curious what
22 the -- I am a bit concerned about black-and-white
23 absolutes, 1.00 inches, 1.00 hours, in terms of
24 criteria that apply, you know, specifically criteria
25 that apply universally to everyone everywhere

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1 regardless of the actual plant situation.

2 MR. GORMAN: Yes. Well, I guess one of
3 the implicit, maybe not stated, requirements of the
4 guidance document is that you shouldn't do something
5 foolish.

6 (Laughter.)

7 MEMBER STETKAR: Okay. I hope not.

8 MR. GORMAN: Because we are expecting
9 these analyses to be performed by people who are
10 qualified engineering personnel that base their
11 decisions and their actions based on engineering
12 principles and engineering analysis. That was pretty
13 much the argument that we got into, the discussion
14 that we got into at NRC relevant to flow diversions.
15 We don't want to be arbitrary, but we know that there
16 are flow diversions of specific sizes that both they
17 and we would agree are not a problem for these
18 systems.

19 MR. HUTCHINS: And that was one of the
20 reasons for the expert panel also, is to bring in --

21 MR. GORMAN: Right.

22 MR. HUTCHINS: -- operators, maintenance
23 people, those types of people, to review the lists, so
24 that we have some collegiate review of the list versus
25 just an engineering person sitting down.

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1 MR. GORMAN: Right.

2 CHAIR SIEBER: On the other hand, you
3 didn't go through all the instances of approximate 1
4 inch and decide whether that was valid for each and
5 every case or not, is that correct? It is just sort
6 of a number --

7 MR. GORMAN: Not specifically, no. Right.

8 CHAIR SIEBER: Yes, it is just sort of a
9 number you picked, and it seems reasonable to me.

10 MR. GORMAN: Yes. And that's not a
11 current revision or addition to the document. I think
12 that's been in there since the first time we wrote in
13 1997.

14 MEMBER STETKAR: Thanks.

15 MR. GORMAN: Yes. So did I answer the
16 question?

17 MEMBER RAY: Yes. Yes. No, that's fine.
18 Thank you.

19 MR. GORMAN: And NEI 00-01, Revision 2,
20 has been issued to the industry for use, and that was
21 in May of this year. People have it out there, and
22 people are reviewing and trying to understand it and
23 trying to apply it.

24 The interface with Reg Guide 1.189, Rev 2,
25 it was our intention to have the guidance in 00-01

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1 endorsed to the largest extent possible within the Reg
2 Guide. Our reasoning for that was that we thought we
3 had developed a fairly comprehensive criteria where we
4 looked at what we considered to be every aspect of
5 post-fire safe shutdown, and we provided criteria that
6 was consistent with the application of those
7 principles over the last 30 years. We also believe
8 that we have added in criteria that addressed the
9 recent issues on multiple spurious operations and
10 discussions we had with the staff relative to required
11 and important to safe shutdown.

12 We also believe that we had put in
13 information there that kind of provided good clarity
14 on when an operator manual action could be used and
15 when it couldn't be used, and when you needed to make
16 a submittal to get approval to use it.

17 So it was our intent to have that
18 information included. That was pretty much our
19 substantive set of comments related to the comments we
20 provided to the Reg Guide. Most of those comments
21 that we put in have been accepted.

22 As I said before, I think we made good
23 progress on the whole criteria document. We do have a
24 couple of open items, though, and they happen to align
25 very well with the open items that Dan talked about.

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1 CHAIR SIEBER: Okay. Well, let me ask you
2 this question or let me ask the staff: are these open
3 items for the staff? In other words, by calling these
4 items open items, does that mean the staff is not
5 prepared to issue the Draft Rev 2 of Reg Guide 1.189?

6 MR. FRUMKIN: No. This is Dan Frumkin.

7 In the judgment of the staff, these are
8 issues. Actually, one of them is currently undergoing
9 testing. Another one, which he is mentioning in
10 there, we plan to work with the industry.

11 In the staff's judgment, these do not,
12 should not stand in the way of the issuance of the Reg
13 Guide, but that's the staff's position.

14 CHAIR SIEBER: Does that mean that if the
15 testing comes out with an answer different than what
16 you expect, you will have to revise the Reg Guide
17 again?

18 MR. FRUMKIN: We would plan to revise the
19 Reg Guide as much as necessary, but currently the
20 testing is consistent with our current position in the
21 Reg Guide.

22 CHAIR SIEBER: You mean the results of the
23 testing?

24 MR. FRUMKIN: Yes, the results, the
25 preliminary results of the testing.

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1 CHAIR SIEBER: And when will the testing
2 be done? When will it be completed?

3 MR. FRUMKIN: Probably a preliminary
4 report, early next year, something like that. Then,
5 again, one thing we didn't mention about this testing
6 is the industry is involved in the testing. They have
7 got some industry observers, which we feel is good for
8 transparency and openness, and so forth. Then they
9 are also providing insights into the testing as it
10 goes on.

11 CHAIR SIEBER: Is industry conducting
12 their own testing? Will this become a contest in test
13 results?

14 MR. HUTCHINS: The testing that we are
15 contemplating right now has to do more with reducing
16 some of the conservatisms in fire PRA development. We
17 are looking at, talking to EPRI, talking about
18 gathering up some information. We are having an
19 industry forum in September. We will be talking about
20 fire modeling and benchmarking that, and then going to
21 the NSAC, the NEI committee of all the CNOs, and
22 asking for some money to do some additional testing to
23 help the fire PRA reduce the methodology.

24 CHAIR SIEBER: Okay. So that involves Reg
25 Guide 1.205, as opposed to --

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1 MR. HUTCHINS: Exactly, yes. We are not
2 looking at --

3 CHAIR SIEBER: Now 1.189 allows modeling
4 of specific issues? Does the NEI work, the industry
5 work that is being done right now involve those small
6 modelings that they may produce to provide exemptions
7 under Reg Guide 1.174?

8 MR. HUTCHINS: I think what will help
9 that, again, we are having a benchmarking section as
10 part of the industry forum in September to talk about
11 that and bring together utilities that are applying
12 fire modeling to talk about it and to try to further
13 the technology.

14 CHAIR SIEBER: Okay. Why don't you go on
15 with your open items then?

16 MR. GORMAN: Okay. The first open item is
17 Appendix E on operator manual actions. As Dan
18 explained earlier, the NRC prepares an approach for
19 reliability to be consistent with NUREG-1852, rather
20 than the guidance that we have included in Appendix E.

21 CHAIR SIEBER: And that's your NEI
22 document?

23 MR. GORMAN: NEI document. Yes, we've
24 included a number of things in appendices that needed
25 a detailed explanation.

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1 And our appendix tells the licensees that
2 they should use 1852 if they are making a submittal to
3 the NRC for approval of an operator manual action.
4 The criteria that we have in the document, however, is
5 a criteria that is consistent with what has been
6 applied to operator manual actions over the history of
7 Appendix R, and it is also consistent with criteria I
8 believe that's been in the NRC inspection modules over
9 the course of time.

10 So, for existing operator manual actions,
11 and I suppose operator actions that would be
12 consistent with those existing ones, we would expect
13 people to apply the criteria in Appendix E. And if
14 you needed to make a submittal to justify an operator
15 action, where Appendix E gives you the criteria when
16 you need to do that, then that submittal should be
17 based on consideration of NUREG-1852.

18 CHAIR SIEBER: Well, it would seem to me
19 that if you are going to decide as a licensee whether
20 you need to seek an exemption or not, you would use
21 the tool that the exemption --

22 MR. GORMAN: Right.

23 CHAIR SIEBER: -- specifies in your
24 decisionmaking as to whether you need an exemption or
25 not, rather than some other methodology.

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1 MR. GORMAN: Right, and that is what our
2 Guide says. If you are going to make a submittal to
3 the NRC, look at NUREG-1852.

4 CHAIR SIEBER: Okay. On the other hand,
5 to make the decision as to whether you are going to do
6 the submittal, wouldn't you also look at 1852?

7 MR. GORMAN: Oh, yes. Yes. I guess, in
8 my mind, they are one in the same. The distinction I
9 am trying to make is between operator actions that
10 many licensees have had on the books probably for the
11 life of the plan.

12 CHAIR SIEBER: Well, okay.

13 MR. GORMAN: And that we have been going
14 back and forth since about 2000, 2001, as to which
15 ones are okay and which ones aren't okay. I think we
16 have now determined that certain ones are okay, and we
17 are saying that the ones that are okay were based on
18 the criteria in Appendix E and should be acceptable
19 based on that criteria.

20 MEMBER RAY: Can you come up with a
21 different phrase than, if you're going to make a
22 submittal? Because I agree with Jack that doesn't
23 seem like an appropriate qualification. Some other
24 way of saying where you would apply the NUREG.

25 CHAIR SIEBER: Well, to expand that a

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1 little bit, if you have an exemption, you have an
2 exemption, and the exemption stays. If something new
3 comes up, why would you not look at 1852 to decide
4 whether you need an exemption or not?

5 MR. GORMAN: Right.

6 MR. HUTCHINS: So the expectation would be
7 that, if you already went through this methodology and
8 it comes up determining that they need a new manual
9 action on a required system, they would submit an
10 exemption or a deviation, depending on the vintage of
11 the plant, to ask the NRC for permission to use an
12 operator manual action on a required system.

13 MR. GORMAN: Again, I think maybe an
14 example helps here. For example, Dan's diagram with
15 the tank and the flow-diversion valve, and we talked
16 about that flow-diversion valve opening, draining the
17 tank in 45 minutes.

18 A real-life example for a BWR would be an
19 opening of a pumpdown system for the suppression pool.

20 For Susquehanna, that is about a 6-inch line. It
21 used go to the condenser. Now it goes to liquid
22 radwaste.

23 When it went to the condenser, if you put
24 a vacuum on it, you got some additional assist in
25 pulling water out of the tank. If you postulated

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1 spurious opening of a number of valves and a spurious
2 start of the pump, you would end up draining the
3 suppression pool to the point where you start to
4 encroach upon the vortex limits, MPSH requirements for
5 some of the pumps in about 11 hours.

6 So our evaluation of that was we would
7 tell our operators, if that were to happen, that
8 within 11 hours they needed to get somebody out there
9 to do something about it.

10 So, for an operator action like that, I
11 wouldn't believe that I would need to do a real
12 detailed study about its feasibility, its reliability.

13 It is something that is certainly going to be well
14 beyond the postulated event that we would be looking
15 at for fire containment.

16 MEMBER STETKAR: Yes, but suppose, Tom, on
17 a Pressurized Water Reactor you had an RWST or a
18 spurious opening of couple of containment sump valves
19 to drain the RWST into the containment sump in 45
20 minutes.

21 MR. GORMAN: That's the 45-minute example,
22 right. So that would have to be treated differently.

23 MEMBER STETKAR: Well, but I didn't read
24 that anywhere in your guidance, that it would be
25 treated differently, because your guidance just says

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1 any valve that can drain down a tank is important to
2 safety, not required for safe shutdown.

3 MR. GORMAN: Right, but in our mind,
4 classifying something as important to safety as
5 opposed to required for safe shutdown doesn't relieve
6 us of any responsibility to make sure that we can
7 safely shut down the plant. It is kind of a legal
8 distinction that says, for these, an operator action
9 may be feasible; for these, an operator action is not
10 feasible.

11 And if you can't accomplish it, you can't
12 accomplish it. You've got to provide the protection.

13 CHAIR SIEBER: The fact is that you have
14 to do something about it, regardless of which of the
15 two categories it fits in --

16 MR. GORMAN: Right.

17 CHAIR SIEBER: -- unless it makes no
18 difference at all. If you can't do it within an hour,
19 then that puts it in the required list of things to be
20 protected, as opposed to those for which you allow
21 operator action.

22 MR. GORMAN: Right. If it can cause an
23 impact to your ability to safely shut down within one
24 hour, then on the required path, then you have to
25 keep --

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1 MEMBER RAY: Yes, but the important thing,
2 what he just said was on the required, on the safe
3 shutdown path -- he called it the required path -- if
4 it is part of the safe shutdown path. It doesn't
5 automatically become required just because of the one-
6 hour rule if it is located elsewhere than the safe
7 shutdown path.

8 CHAIR SIEBER: Yes.

9 MEMBER RAY: But to get back, I think
10 where we started this dialogue had to do with, can you
11 describe when you would use the NUREG to define the
12 operator action assumptions, I guess? You used the
13 phrase, if you had to submit it to the NRC, then you
14 would refer to the NUREG. And I said, can you define
15 that in any other way? And you then said a number of
16 things, and I lost the trail.

17 Basically, I think what you are saying is,
18 if you make a change. You know, you talked about
19 things that I was interpreting to be a change in the
20 fire protection plan.

21 MR. GORMAN: It could be a change, and as
22 a result of the application of this new criteria,
23 there would be new issues that are identified.

24 MEMBER RAY: Well, okay.

25 MR. GORMAN: So those would be considered

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1 on a change --

2 MEMBER RAY: Maybe I am putting you on the
3 spot too much. I am trying to find something other
4 than the phrase, if you submit it to the NRC, then
5 look at the NUREG to define the acceptable operator
6 action assumption.

7 CHAIR SIEBER: I have the same problem.

8 MEMBER RAY: And I am trying to get you to
9 say it in another way, and maybe that is not fair.

10 The predicate is what is the problem. You
11 only apply the NUREG if you are going to make a
12 submittal to the NRC. Otherwise, you can assume
13 whatever you want about the time available.

14 MR. GORMAN: Well, the NUREG really
15 doesn't give you available times.

16 MEMBER RAY: Okay, I thought that was what
17 you were talking about, was the difference, the
18 disagreement --

19 MR. FRUMKIN: This is Dan Frumkin.

20 I think the distinction is something Steve
21 Hutchins made. If it is one of the equipment that is
22 required for safe shutdown, then a submittal is
23 required, and therefore, they would use the NUREG. If
24 it is important to safe shutdown, then I will let --
25 is that what you guys mean by if you're going to make

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1 a submittal?

2 MR. HUTCHINS: Exactly.

3 MR. GORMAN: Right.

4 MR. FRUMKIN: Okay.

5 MR. GORMAN: If it is required for safe
6 shutdown --

7 MR. FRUMKIN: You guys were just
8 struggling there. I thought I would step in.

9 MR. GORMAN: If it is required for safe
10 shutdown and you would like to propose something to
11 the NRC where you justify the use of an operator
12 manual action, then you had better be looking at 1852
13 because that is going to be the basis for how they are
14 going to review your submittal.

15 CHAIR SIEBER: Yes.

16 MR. GORMAN: Does that help?

17 MEMBER RAY: I guess, yes. It is less
18 than what I thought you were trying to say. I mean,
19 to just say, well, you'd better look at it because
20 that's the way they're going to review your submittal,
21 yes, that is wise counsel, I guess. It doesn't sound
22 like an industry position on this particular operator
23 action.

24 CHAIR SIEBER: No. No, it doesn't. On
25 the other hand, I'm not sure where else they could

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1 go --

2 MEMBER RAY: Yes.

3 CHAIR SIEBER: -- other than to fail in
4 their submittal.

5 MEMBER RAY: Okay, I'll throw in the
6 towel.

7 CHAIR SIEBER: Okay. Why don't we go on?

8 MR. GORMAN: Okay. So we do believe we
9 have made some reference in NUREG-1852. We also
10 believe we have included the criteria that documents
11 how many of the existing operator manual actions have
12 been reviewed and how they have been inspected for
13 periods of time.

14 We also believe that Appendix E provides
15 additional criteria beyond what is in 1852 relative to
16 what is an acceptable, what is an operator manual
17 action that requires a submittal to the NRC, and which
18 ones are acceptable within the bounds of the criteria
19 that we have developed in this document.

20 We would still like to see Appendix E
21 endorsed. If there are some exceptions that need to
22 be taken, we would like to at least have that
23 endorsement.

24 MEMBER STETKAR: Tom?

25 MR. GORMAN: Yes?

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1 MEMBER STETKAR: I think we are doing okay
2 on time. Just stop me if you don't think we are going
3 to make it.

4 If I read Appendix E, one of the things
5 that I hung up on, and Dan mentioned it in his
6 presentation, is that Appendix E endorses the use of
7 NUREG-1852 to evaluate the feasibility of operator
8 actions. There are two or three paragraphs in
9 Appendix E that spend quite a bit of effort to define
10 what is time T_0 because 1852 requires a feasibility
11 assessment based on the start of a timeline.

12 MR. GORMAN: Right.

13 MEMBER STETKAR: And when you define time
14 $T=0$ can affect whether or not you determine whether
15 there is sufficient time for operators to perform the
16 required actions.

17 It is my interpretation, if I read
18 Appendix E, that your time T_0 begins 10 minutes after
19 the control room operators recognize that there is a
20 fire, is that correct?

21 MR. GORMAN: Recognizes that there is a
22 fire and takes actions to scram the reactor and close
23 the MSIBs, do things to put the reactor in a safe
24 condition.

25 MEMBER STETKAR: That could be some

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1 substantial amount of time after the fire actually
2 started, is that correct?

3 MR. GORMAN: It's possible.

4 CHAIR SIEBER: Yes, and not determined.

5 MEMBER STETKAR: That's right. It is 10
6 minutes after the operators recognize there is a fire
7 and actually do something, and they do something, and
8 then 10 minutes after that becomes T_0 for any
9 subsequent operator actions, is that the way it is
10 applied?

11 MR. GORMAN: It becomes T_0 as a starting
12 point for figuring out timing, which could get you
13 into thermal hydraulic analysis. They are going to
14 require some kind of an analytical estimation of the
15 state of the reactor at the point in time when you
16 start your analysis. You can't do those kinds of
17 analyses without boundary conditions on it.

18 So it is an analytical assumption, and it
19 is --

20 MEMBER STETKAR: Well, the 10 minutes is
21 an arbitrary assumption --

22 MR. GORMAN: Arbitrary, right.

23 MEMBER STETKAR: -- based on some presumed
24 operator cognition and response.

25 MR. GORMAN: Right.

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1 MEMBER RAY: Now this is the same 10
2 minutes that Dan was talking about?

3 MEMBER STETKAR: That I believe is the
4 same 10. Dan, is that the same 10 minutes that you
5 were talking about that the staff is basically
6 concerned about?

7 MR. FRUMKIN: Yes.

8 MEMBER STETKAR: Okay. Thanks.

9 MR. GORMAN: Yes, and that is not a 10-
10 minute timeframe to perform operator manual actions.
11 It is kind of the starting point of your thermal
12 hydraulic analysis. It is the starting point of your
13 study of timing for performing operator manual
14 actions, and it is --

15 CHAIR SIEBER: Yes, and as time clicks,
16 before you start the counting of the 10 minutes and
17 the one hour, the plant is deteriorating. So you may
18 not reach the time for operator action. So, in my
19 view, that is sort of conservative.

20 Would you conclude the same thing?

21 MR. GORMAN: Ten minutes?

22 CHAIR SIEBER: No, the fact, where the
23 starting point is, that it is delayed from the start
24 of the incident. It doesn't really start until the
25 operator figures out what is going on, and then waits

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1 10 minutes while his mind says, I'd better go out and
2 do these things.

3 MR. GORMAN: Yes, and the time zero, I
4 think we were originally asked to provide a definition
5 for time zero in 1998. This is the best shot I have
6 seen in 11 years.

7 CHAIR SIEBER: It has shreds of being
8 arbitrary in there. On the other hand, it appears
9 that there was some reasoning that went into the
10 selection.

11 MR. GORMAN: There was some reasoning,
12 yes.

13 CHAIR SIEBER: Yes. It is not totally
14 conservative, but --

15 MR. GORMAN: But you can't pick a time
16 zero that everybody in this room would feel is --

17 CHAIR SIEBER: That's right.

18 MR. GORMAN: -- 100 percent justified. It
19 is an assumption.

20 CHAIR SIEBER: Yes. It would be different
21 for different crews, too.

22 MR. GORMAN: Right. Now if you got into
23 detailed fire modeling of every aspect of everything
24 in the plant, and then you could pick a time zero for
25 each scenario, depending on which equipment was

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1 available and which equipment was not available, but
2 for the deterministic rules, we don't apply design
3 basis fires like that. We assume damage. To come up
4 with starting points for operator manual actions,
5 starting points for thermal hydraulics, you basically
6 have to pick something.

7 CHAIR SIEBER: That's right.

8 MR. GORMAN: This was our pick.

9 MEMBER RAY: John, when Dan made the
10 presentation, he referred to it as, there will be 10-
11 minute criteria. I didn't understand at the time what
12 we were talking about.

13 You maybe have a succinct way of saying
14 what the heck this 10 minutes is. Could you speak
15 what it is we are talking about here?

16 MEMBER STETKAR: I guess I would rather
17 hear NEI answer that because I'm only reading --

18 MEMBER RAY: That's fine.

19 MEMBER STETKAR: -- an interpretation --

20 MEMBER RAY: I am trying to get something
21 that is short and crisp. We had better try. What is
22 the 10 minutes from the standpoint of the way we look
23 at --

24 MR. GORMAN: The 10 minutes is a timeframe
25 that defines the boundary conditions on your thermal

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1 hydraulic analysis, which would be used to determine
2 the amount of time that you had available to take an
3 action prior to an impact of post-fire safe shutdown.

4 So, when your thermal hydraulics
5 individuals come to you and they want to know what are
6 the boundary conditions on the analysis, you would say
7 the reactor scram, the MSIVs are closed --

8 MEMBER RAY: Okay. That's way too long.
9 I have lost the thread. I don't know what the 10
10 minutes is still.

11 Is it an assumed --

12 MR. GORMAN: It's an assumed number.

13 MEMBER RAY: But I didn't say what yet.

14 MR. GORMAN: Okay.

15 MEMBER RAY: Is it an assumed period in
16 which you can take credit for -- well, I don't know.
17 Never mind. I can't say what it is.

18 MR. HUTCHINS: Probably the easiest way to
19 think about it is a fire starts. It starts to grow.
20 An alarm goes off. The control room recognizes there
21 is a fire. There's 10 minutes where that control room
22 operator has to diagnose the issue, and so forth. At
23 the end of that 10 minutes is where the time zero
24 would start for any perceived -- you know, the
25 operator telling the local operator to go out and do a

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1 manual action, to go somewhere.

2 MEMBER RAY: Okay. So you don't have to
3 assume the interval from the start of the fire until
4 the initiation of operator action is more than 10
5 minutes? You don't have to assume it's 15 minutes,
6 for example? Is that right?

7 CHAIR SIEBER: Well, the starting of the
8 fire, from a time standpoint, is not directly related
9 to an effect on the plant. It is the effect on the
10 plant that the operator sees. That's where the 10
11 minutes starts, and it is thinking time. I've got to
12 do this. I've got to do that.

13 MR. GORMAN: So if you have a procedural
14 action that says, within one hour, within two hours,
15 within three hours, go perform this action, that's
16 your starting point.

17 CHAIR SIEBER: Right.

18 MEMBER RAY: Okay. This isn't working. I
19 agree we still have time, I think. So let's keep
20 trying.

21 He said it was from the start of the fire
22 until the operator had to start taking --

23 MR. HUTCHINS: No, no. No, I said that's
24 time T minus zero. So these things are happening --

25 MEMBER RAY: What is the 10 minutes?

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1 MR. HUTCHINS: The 10 minutes is from
2 where the operator has recognized there is a fire, has
3 recognized there needs to be action, and then will
4 initiate an action.

5 MEMBER RAY: So it is the time during
6 which the fire has been recognized, but during which
7 no operator action needs to be assumed --

8 MR. HUTCHINS: Correct.

9 MEMBER RAY: -- in the analysis? Operator
10 action then begins after the 10 minutes. Okay.

11 Where in this interval is this so-called
12 time zero? The beginning or the end?

13 MR. HUTCHINS: At the end of that time,
14 yes.

15 MEMBER RAY: Time zero then begins at the
16 end of the time. So we have the fire at some
17 indeterminate point in time. Its recognition begins
18 the 10 minutes. Ten minutes later, time zero starts?

19 MR. HUTCHINS: That is when the operator
20 can tell another operator to go do something, right.

21 MEMBER BLEY: And that time zero is the
22 beginning of the time under which you are assuming the
23 operator will be carrying out those actions?

24 MR. HUTCHINS: That's when he starts on
25 his path, right.

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1 MEMBER BLEY: You think he starts right
2 then?

3 MEMBER RAY: There's fire, detection. Ten
4 minutes later, action starts.

5 CHAIR SIEBER: Right.

6 MEMBER RAY: When the action starts,
7 that's time zero?

8 CHAIR SIEBER: That's right. We only have
9 one hour, and if the analysis would show that one hour
10 is too short, then that changes the category.

11 MEMBER RAY: Well, no, it doesn't change
12 it unless it's on the success path, Jack.

13 MR. HUTCHINS: It would change our level
14 of protection. Then we would protect it as if it was
15 a III.G.2 system.

16 CHAIR SIEBER: That's right.

17 MEMBER RAY: Even if it is not on the
18 success path?

19 CHAIR SIEBER: Exactly. That's helpful.

20 MEMBER RAY: Agreed. But, anyway, I've
21 got this timeline now straight. I'm not going to
22 deviate from it, though.

23 CHAIR SIEBER: Yes, if you can't do it
24 within an hour, it's like you can't do it.

25 MR. HUTCHINS: The example would be the

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1 10-inch drain valve. If it could drain down the CST
2 in 45 minutes, and we couldn't do a manual action and
3 we couldn't do fire modeling, we would protect it as
4 III.G.2, even though it was an important to safe
5 shutdown system.

6 CHAIR SIEBER: As if it were safety-
7 related.

8 MR. HUTCHINS: Exactly.

9 MEMBER RAY: But you do have the choice of
10 fire modeling or other things. In other words, you
11 don't automatically have to protect it as III.G.2.

12 MR. HUTCHINS: Right, but if we couldn't
13 do an action, if we couldn't do modeling, we would
14 protect.

15 MEMBER RAY: All right. I think I have
16 time zero and the 10 minutes straightened out finally.

17 CHAIR SIEBER: Okay. Thank you very much.
18 It is clearer now.

19 MEMBER STETKAR: Can I ask one last
20 question before we get to the 20-minute duration of
21 the hot shorts?

22 CHAIR SIEBER: You have less than 10
23 minutes.

24 (Laughter.)

25 MEMBER STETKAR: I hope this will be a

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1 yes-or-no answer.

2 CHAIR SIEBER: Okay.

3 MEMBER STETKAR: In Appendix G, there are
4 lists of -- I think Appendix G, by the way, is really
5 good. There are lists of various multiple spurious --
6 I have to be careful -- whatever you guys called it.

7 MR. GORMAN: Equipment combinations I
8 called it.

9 MEMBER STETKAR: Yes, multiple spurious
10 operations -- I call them multiple spurious
11 operations. They are different. SMOs.

12 For the Boiling Water Reactor, it seems to
13 say that I do not need to consider multiple spurious
14 operations that can prevent scram. Is that correct?
15 Because there has been some justification that the
16 operators can scram the plant quickly enough.

17 MR. GORMAN: The operators have direction
18 in their emergency operating procedures, if they do
19 not scram when they intend to scram, to take immediate
20 action to save the plant.

21 MEMBER STETKAR: So that means that, if I
22 am doing an assessment of SMOs, I don't need to worry
23 about any fire-induced effects that can prevent a
24 reactor scram for a BWR, is that right?

25 MR. GORMAN: That's what we are saying,

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1 yes.

2 MEMBER STETKAR: For a PWR, it seems to
3 say that I need to consider those, though. Is that
4 correct? It is Item No. 39 in your list, if you are
5 looking at it.

6 MR. GORMAN: We have written a specific
7 position paper for the BWRs. I don't believe that
8 there is a comparable evaluation that has been
9 completed for the P's.

10 MEMBER STETKAR: Okay. We'll keep going
11 then.

12 MR. GORMAN: Okay. So, to summarize the
13 operator manual action item, we recognize the staff's
14 position on the use of 1852, as some of the comments
15 here suggested, or broader use of that document might
16 be recommended for the industry, too. But, regardless
17 of all those, we think there's a lot of other good
18 information and necessary information in Appendix G
19 that's not in 1852. We would like to see that
20 appendix endorsed and, if necessary, endorsed with
21 some exceptions.

22 The 20-minute duration for hot shorts.

23 CHAIR SIEBER: Yes, on the other hand, if
24 they adopt your position, that is not crucial from a
25 safety-related standpoint? It is just the methodology

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1 differs in the Reg Guide than it does from Appendix E,
2 is that correct? You are going to end up at the same
3 endpoint and the same safety determination --

4 MR. GORMAN: I think yes. I would think
5 so.

6 CHAIR SIEBER: -- regardless of which path
7 you take?

8 MR. GORMAN: I think so, yes.

9 CHAIR SIEBER: Yes, I do, too. Yes.

10 So you like your path; they like their
11 path, which is really where we're at, right?

12 MR. GORMAN: We did all the other stuff to
13 ask them.

14 CHAIR SIEBER: Okay.

15 MR. GORMAN: The 20-minute duration for
16 hot shorts. As NRC expressed, their concern is
17 blessing off on a 20-minute duration for hot shorts.

18 What we currently assume in the analysis
19 is a hot short lasts until somebody takes an action to
20 mitigate its effect. So, if you have a hot short, and
21 even if you don't need that system for six hours, if
22 you want to use it after six hours, you need to build
23 something into your procedures that has an operator go
24 and open a breaker or do something to eliminate that
25 hot short, so that it allows you to do something with

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1 that equipment.

2 With respect to the testing that has been
3 done through NEI/EPRI and CAROLFIRE testing, we
4 believe that the 20-minute duration is a good number,
5 and it is a good number with wide margin to what we
6 actually saw in the testing.

7 We would like to see that number endorsed.

8 We recognize that we do have the DC testing program
9 going on right now, and that may give us different
10 results. I believe we already say in our document
11 that the DC testing results need to be reflected into
12 this hot short duration. But we would like to see
13 that endorsed, endorsed with an exception.

14 Ideally -- and again, we make this
15 recommendation without necessarily understanding all
16 the political ramifications or the regulatory
17 ramifications -- but, to us, it would be good to
18 understand the results of the DC testing and to
19 reflect them into both our document and to the Reg
20 Guide prior to getting people started on this
21 reanalysis effort that we are about to embark on as
22 soon as the Reg Guide goes out.

23 CHAIR SIEBER: Yes, but until the testing
24 is done and the report is issued and accepted, the
25 staff's position is conservative, right?

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1 MR. GORMAN: Right. Right.

2 CHAIR SIEBER: Okay.

3 MR. GORMAN: The third item is the non-
4 concurrent hot shorts and separate non-seal-in/non-
5 latching cables. Again, we have asked for this as a
6 criteria to be applied to the classification of
7 components that are important to safe shutdown. We do
8 not apply them to the ones that are required for safe
9 shutdown.

10 The circuit failure criteria that we have
11 included in our document says, if you are required for
12 safe shutdown, you have to make sure any cable that
13 can affect your ability to perform your function, of
14 the equipment to perform its function, is properly
15 protected, properly analyzed, properly addressed.

16 We saw in both the NEI/EPRI, and the
17 CAROLFIRE testing that -- and I am talking
18 specifically here about the intermediate scale
19 testing. I think there was 15 or 16 test
20 configurations in each one of those tests.

21 The basic configuration was a seven-
22 conductor cable surrounded by three single-conductor
23 cables.

24 CHAIR SIEBER: Right.

25 MR. GORMAN: Some of the single-conductor

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1 cables were energized. Conductors within the seven-
2 conductor cable were energized. That configuration
3 was subjected to fires of various heat-release rates.

4 What we saw in all of that testing, with
5 one exception, is that even though you had a cable
6 bundle in the same cable tray sitting next to another
7 cable in the same, that you didn't have a concurrent
8 set of hot shorts happening in those adjacent cables.

9 CHAIR SIEBER: Yes.

10 MR. GORMAN: We understand that it has a
11 limited scope of cable testing. It was done for a
12 specific heat-release rate. But I also believe that
13 the heat-release rates were kind of selected in order
14 to be representative of the types of fires we might
15 see in the plants. Harry may or may not agree with
16 that.

17 CHAIR SIEBER: My memory of those tests
18 was you didn't have intercable shorts that you could
19 have, particularly in the seven-conductor cable,
20 intracable shorts.

21 MR. GORMAN: Right, right. So our
22 criteria says, if you have a multi-conductor cable,
23 you need to analyze for whatever set of combinations
24 can happen within that cable. Our criteria, we are
25 debating with the staff still, is that if you have a

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1 separate cable that --

2 CHAIR SIEBER: You can't cross --

3 MR. GORMAN: -- is not part of that cable
4 -- not that they won't cross. It is just that if this
5 cable, when it becomes energized due to a hot short,
6 if it closes a contact that energizes a relay, that
7 then aligns up a separate circuit and allows for
8 additional hot shorts to affect the performance of
9 that circuit; we are saying we don't believe that
10 that's a necessary assumption to look at.

11 The reason why we are saying that is we
12 believe that we need to have a limit on the number of
13 issues that we deal with.

14 Just as an example, we went through --

15 CHAIR SIEBER: Do you have test data that
16 proves that?

17 MR. GORMAN: Just the test data that is
18 done. In reviewing that test data, what that test
19 data showed to me was that you do get hot shorts --

20 CHAIR SIEBER: Yes.

21 MR. GORMAN: -- but you need to have,
22 depending on your type of cable, you need to have
23 temperatures in the 400- to 500-, 700-degree range,
24 and you need to have cable damage. If you get cable
25 damage from those temperatures in that range, then

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1 there is a good chance you are going to get a hot
2 short.

3 There is also information in that testing
4 that suggests that we can get cables to certain
5 temperatures and have no cable damage and have no hot
6 shorts.

7 CHAIR SIEBER: But those tests, as I
8 recall them, were significantly dependent on the cable
9 type.

10 MR. GORMAN: They were, yes.

11 CHAIR SIEBER: So your criteria does not
12 take into account the cable type, right?

13 MR. GORMAN: No, it does. We looked at
14 all cable types across all the testing.

15 CHAIR SIEBER: So it applies to all cable
16 types?

17 MR. GORMAN: All cable types, yes.

18 CHAIR SIEBER: So the difference, then, is
19 the speed at which it occurred? The thermo-setting
20 was the better cable --

21 MR. GORMAN: Right.

22 CHAIR SIEBER: -- as opposed to thermal-
23 plastic.

24 MR. GORMAN: Thermal-setting was better in
25 terms of --

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1 CHAIR SIEBER: So the time to the short
2 was maybe double --

3 MR. GORMAN: Right.

4 CHAIR SIEBER: -- for a thermal-setting
5 versus thermal-plastic?

6 MR. GORMAN: Right.

7 CHAIR SIEBER: Okay. Let me think about
8 that.

9 MR. GORMAN: We really propose this as
10 what we believe to be a reasonable limit, based on
11 testing results; that when you couple the criteria
12 that we believe we have included in our document with
13 the other aspects of defense in-depth, you have safe
14 plant design.

15 We look at the components of the defense
16 in-depth aspects of fire protection design as all
17 needing to be present. You need to make sure you
18 don't have fires, and as the first one, you need to be
19 able to rapidly detect them and extinguish them, if
20 you have them. The other one is you have to have the
21 path available to safely shut down, in the event that
22 you do have a fire.

23 We also look at that triangle and we say
24 no aspect of it is going to be perfect. In my view,
25 looking at not allowing this type of a criteria starts

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1 to drive us toward perfection in the area of circuit
2 analysis, and in then the attempt to drive us to
3 perfection, I think it will introduce a large amount
4 of chaos into the analysis.

5 We have looked at our automatic initiation
6 circuits are really one of the primary areas of
7 concern. If you look at the automatic
8 depressurization system, spurious ADS on one division,
9 on one unit, you can come up with close to 400
10 different combinations of fire-induced circuit failure
11 combinations that could cause that event to happen.

12 MEMBER RAY: Well, chaos is a strong word.
13 I'm sure the staff doesn't want to have chaos,
14 either. They must have a different view.

15 CHAIR SIEBER: Yes. I think the agenda
16 asks the staff to address that. But I have your same
17 thought. I would ask the staff, you have heard and
18 understood this comment? Okay, and when it is your
19 turn, you can tell us your response to it. Okay,
20 thank you.

21 MR. GORMAN: So, again, we would like to
22 see an endorsement of our position. We think, to some
23 extent, the completion of the DC testing may shed some
24 additional light on our position on this issue also.
25 As an alternative to endorsing the position, we are

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1 looking at, as an alternative, maybe waiting for the
2 completion of the DC testing, understanding the DC
3 testing results, factoring those into our document and
4 the Reg Guide prior to starting off on the reanalysis
5 efforts.

6 CHAIR SIEBER: And the testing will be
7 done in the end of this year? Okay.

8 MEMBER STETKAR: Are you looking at cable-
9 to-cable effects in DC also?

10 MR. FRUMKIN: Yes.

11 MR. GORMAN: The DC testing is an
12 ungrounded DC -- is that --

13 MR. FRUMKIN: Yes, it is ungrounded,
14 right.

15 CHAIR SIEBER: Well, that is the more
16 difficult one because you lose an element of
17 protection that would occur through ground pulse.

18 MR. GORMAN: Right.

19 CHAIR SIEBER: Yes. Okay.

20 MR. GORMAN: So, in our conclusions, we
21 went back and we have looked at the Commission
22 direction. I guess we would give our combined rate to
23 our efforts and the staff's effort on this one of
24 maybe a 90 percent, which is a good A-, but in this
25 industry, with rising expectations and striving for

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1 excellence, you know, we are kind of hoping for an A+
2 because this is an area where, when people start into
3 this reanalysis, it is going to be a very expensive
4 endeavor. It is going to be more expensive, depending
5 on the pedigree of your current analysis.

6 So people could spend lots and lots of
7 money on these analyses. I know personally I have
8 done Susquehanna's analysis twice for various reasons.

9 The first time it cost us about \$40 million, and the
10 next time we spent about \$30 million between the
11 analysis and the repercussions of the analysis in
12 terms of plant changes that needed to take place. So
13 we know it is expensive.

14 We would like to have, as others would, a
15 clear criteria on what it is that we are being asked
16 to do before we kind of embark upon it again. We have
17 these items that I think are things that need to be
18 close, we need to come to some agreement on, but also
19 items that, as I said in the beginning, we have been
20 talking about openly for two or three years, on some
21 level for 15 years, and subversively for on the order
22 of 30 years.

23 So we are very, very close to coming to a
24 conclusion on this. If I have a vote, I would like to
25 vote for finishing up and putting the criteria

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1 together, make sure we all understand and agree with
2 it, and then we move on from there.

3 CHAIR SIEBER: Now my understanding,
4 though, is that your fire analysis that you have today
5 is valid, including the exemptions that are associated
6 with it, except to the extent that enforcement
7 discretion has been granted with regard to items like
8 associated circuits.

9 So you aren't going to start off doing a
10 whole reanalysis of your plant. You are going to do
11 an analysis of associated circuits and some other
12 things where enforcement discretion has been granted
13 for some time, and that analysis involves generally
14 the things that you are talking about.

15 MR. GORMAN: Right.

16 CHAIR SIEBER: And the question is, to
17 what extent do you rely on your methodology, which
18 would basically interpret, admittedly, unfinished test
19 data to provide some shortcuts to the analysis as
20 opposed to the staff's methods? And you believe that
21 those shortcuts are warranted?

22 MR. GORMAN: I don't know if I would refer
23 to them as shortcuts, but, yes, the items that we are
24 looking at, I call the criteria myself.

25 CHAIR SIEBER: Yes, right.

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1 MR. GORMAN: And reanalysis needs to have
2 a criteria on it that can be understood and be
3 implemented. These items I think are important
4 aspects of that, particularly as we embark upon
5 dumping a whole bunch of new items into that analysis
6 that is already a very, very complicated analysis.

7 CHAIR SIEBER: Well, I don't know how the
8 other members think, and we will find out in a little
9 bit, but nothing seems to jump out at me like there is
10 a violation of our basic concepts of safety --

11 MR. GORMAN: No, no.

12 CHAIR SIEBER: -- regardless of which way
13 we go, except one is more conservative than the other,
14 it appears.

15 Okay. At this point, I would ask the
16 members if they have any additional questions they
17 would like to ask our representatives from the Nuclear
18 Energy Institute, based on their comments.

19 MEMBER BLEY: None from me, Jack.

20 CHAIR SIEBER: Okay. Bill? None?

21 MEMBER ABDEL-KHALIK: I have a question to
22 both the industry and the staff. Are there any
23 lessons learned from the recent fire at the Columbia
24 station that would pertain to this Reg Guide?

25 MR. WEERAKKODY: No, we don't see anything

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1 new coming out of that fire that has to be factored
2 into this.

3 MEMBER ABDEL-KHALIK: How do you know
4 that?

5 MR. WEERAKKODY: Well, in the first place,
6 it was a fire that did not affect any of the safety-
7 related plants. What we are looking for here is any
8 new insights of, can a fire cause multiple concurrent
9 hot shorts? To the extent we have looked at that, we
10 didn't have anything coming out of that fire.

11 MEMBER ABDEL-KHALIK: Okay.

12 CHAIR SIEBER: Harold?

13 MEMBER RAY: No, I didn't have anything
14 more for NEI. Thank you, Jack.

15 CHAIR SIEBER: Okay. Thank you very much,
16 gentlemen.

17 Next on the agenda is the staff's response
18 and summary.

19 MR. WEERAKKODY: Yes, I would just like to
20 make one statement, and then I will turn it over to
21 Dan --

22 CHAIR SIEBER: Okay.

23 MR. WEERAKKODY: -- to basically
24 substantiate that.

25 The staff believes that, even though

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1 there's a handful of issues that we have not come to
2 full agreement with the industry, that we have enough
3 of an understanding to issue the Reg Guide and
4 proceed, and get the licensees to comply with the
5 expectations and to say they are using the methods.

6 With that --

7 MEMBER RAY: Well, wait. Having said
8 that, though, that sounds like a direct disagreement
9 with the idea that at least one aspect of this would
10 create chaos in the analysis. So, surely, you have a
11 different -- I guess you want Dan to address this
12 specifically, but you must be disagreeing with the
13 view that chaos would result.

14 MR. FRUMKIN: This is Dan Frumkin.

15 MR. WEERAKKODY: We do the same thing.

16 MR. FRUMKIN: Yes. What we have here is,
17 I guess, a typical regulatory conundrum. On one hand,
18 we have -- and these are just different factors that I
19 am just going to pull together and show you some of
20 the ranges that we deal with.

21 On one hand, in our AC circuit testing
22 that we have done, we have had, I think, the longest
23 AC circuit is under 11 minutes, but most of them were
24 in under the 30-second range. So we, as the staff,
25 can make a deterministic determination, if I can say

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1 that, that 20 minutes is reasonable. It provides
2 reasonable assurance that AC circuits will clear
3 within 20 minutes. We are comfortable giving that to
4 the licensee as a justification.

5 On the far end of it, we have very little
6 testing for circuits or for DC circuits. Some of the
7 testing that is available by the licensee and some of
8 our current testing that is ongoing says that 20
9 minutes is not a reasonable value because of the
10 length that DC circuits have stay locked in. So the
11 staff is not comfortable saying 20 minutes is a good
12 assumption.

13 Now if the industry came in with an hour,
14 I'm not sure that we could do anything with that,
15 either, based on the current level. But this is the
16 bounding. When we have a lot of good, reasonable
17 information, we can call that supportive of a
18 deterministic analysis. When we have contrary
19 information, we say, licensees, you need to do more
20 work.

21 Now the chaos, the slide I put up as the
22 non-concurrent hot shorts and separate non-seal-
23 in/non-latching cables, we have 120 tests and we had
24 one failure, one concurrent failure. This, in my
25 opinion, falls in between those. It's one in 100.

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1 Okay?

2 It is certainly not as rare as never from
3 our AC testing, and it is certainly more often than
4 never and more reasonable than the 20 minutes.

5 So what I see is this is a perfect -- I
6 guess, to carry on what Tom was saying, in some cases
7 where you have a large possibility of a fire and a
8 large consequences, 1 in 100 may not be acceptable.
9 But in some cases where you have a low likelihood of a
10 fire and low likelihood of consequence, 1 in 100 may
11 be enough to say that that is acceptable.

12 MEMBER RAY: Well, chaos is inevitable
13 because it's necessary, but what is being proposed
14 here is wait until the testing is done, implying that
15 there will be some change in expectation as a result
16 of the testing yet to be completed.

17 I would interpret your comment just now to
18 be, no, we know enough already; it's not going to
19 change between now and the end of the year. So we can
20 go ahead.

21 Is that a fair characterization?

22 MR. FRUMKIN: On this issue, because of
23 this concurrence, even if we have another 100 tests
24 and it's 1 out of 200, I'm not sure that the staff
25 will be comfortable saying, deterministically, we can

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1 assume this doesn't happen.

2 MEMBER RAY: Okay, fair enough. But I
3 just want to be clear that the remaining testing you
4 don't think would change the bottom-line conclusion
5 that you would draw from the testing already done in
6 this regard?

7 MR. FRUMKIN: Yes.

8 MEMBER RAY: So the consequences may be
9 whatever they need to be, but they're necessary to
10 move ahead. That is basically what I am trying --

11 MR. FRUMKIN: And part of this testing
12 that is occurring, it is kind of a validation of some
13 industry testing that is not publicly available.

14 In the future, though, if industry or the
15 NRC feels it is necessary to focus in on these issues
16 much more closely and with much more specificity, and
17 we are talking a testing program takes two to three
18 years to start, and so forth, then we may be able to
19 gather more insights on this. But a lot of this
20 testing is to validate some existing testing that is
21 out there that's not publicly available.

22 So I don't really foresee that this is
23 going to --

24 MEMBER RAY: You wouldn't change it from
25 chaos to no chaos as a result?

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1 MR. FRUMKIN: Yes.

2 MEMBER RAY: If there's going to be chaos,
3 there's going to be chaos.

4 MR. FRUMKIN: And this is extremely area-
5 dependent. It could vary dependent on cable fill in
6 trays. It could depend on, well, maybe three
7 conductor cables have it, but 20 conductor cables
8 don't. One in 120, it may be, if you reproduced that
9 one, it might happen every single time. But if you
10 reproduced that 119, it may never happen. But we
11 don't have that information right now.

12 CHAIR SIEBER: Well, and that is a matter
13 of chance also.

14 MR. FRUMKIN: Yes.

15 CHAIR SIEBER: Harold, I think your
16 question is one of the key questions that we need to
17 know the answer to. I would say that, in a general
18 scheme of things, a 1 percent chance that an event
19 will happen is pretty small. On the other hand, if
20 you look at root causes of CDF, fire is pretty
21 significant. In that regard, maybe 1 percent should
22 be paid attention to.

23 MR. FRUMKIN: Right, and that is exactly
24 the point. We don't feel, even if we move forward
25 with this approach, as the staff is recommending, I

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1 think it's overstatement to say that there would be
2 chaos because we have risk-informed tools where this
3 number could be applied in the context of the entire
4 area, in the context of the consequences. Although
5 the licensees would likely have to submit that to the
6 NRC, and it would be hard, unfortunately, the testing
7 does not support the dismissal of this issue.

8 MEMBER RAY: Well, it may be. That may be
9 the chaos that they are referring to, what you just
10 said.

11 In any event, it is clear, and Jack
12 summarized it well. So I'm satisfied we understand
13 the two sides.

14 CHAIR SIEBER: Okay.

15 MEMBER RAY: At least I think I do.

16 CHAIR SIEBER: Yes, understanding is a
17 step toward resolution.

18 MEMBER RAY: Yes, right.

19 CHAIR SIEBER: The very first step.

20 Okay. You're going to go through all the
21 open items, right?

22 MR. FRUMKIN: No. Actually, I think I
23 talked about this one. Well, with regard to the 20-
24 minute duration for DC circuits, the evidence isn't in
25 for supporting that, I believe. DC circuits is coming

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1 out of this testing, but the preliminary information
2 is it doesn't support the 20 minutes.

3 The NRC staff is planning on endorsing the
4 20-minute duration for hot shorts of AC circuits. So
5 I think that, in a technical way, we agree with the
6 industry.

7 There was a possibility that we wouldn't
8 have any long-term DC faults, but the preliminary
9 results show that that is not the case.

10 CHAIR SIEBER: Okay, and the reason for
11 that? Because it is not obvious that there is a
12 reason, but it is the difference, the typical
13 difference in protection system settings?

14 MR. FRUMKIN: I've heard the difference in
15 protection system. I have heard Harry tell me that,
16 since AC passes through zero, that there is electrical
17 phenomenon which causes these things to clear that
18 doesn't occur in DC.

19 CHAIR SIEBER: I have to think about that
20 one.

21 MR. FRUMKIN: And the way that they are
22 grounded. I am not an electrical -- and I think that
23 they are going to need a lot of time. I believe there
24 is perhaps an expert panel planned after this testing,
25 which even once the testing is done, an expert panel

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1 is another 9 to 18 months of people getting together
2 and having conversations, and coming up with a report
3 that is reviewed for public comment. It is a very
4 long process.

5 But, as we learned from the original NEI
6 testing and the expert panel, new information doesn't
7 really come out of the expert panel. They just
8 provide more confidence of the information.

9 On this point, the testing isn't
10 supporting less than 20 minutes --

11 CHAIR SIEBER: Okay. So this one, in your
12 mind, is pretty clear-cut?

13 MR. FRUMKIN: Yes.

14 CHAIR SIEBER: Okay.

15 MR. FRUMKIN: The last NEI open item, as I
16 said, there is some valuable information in their
17 Appendix E, but it is just not to the point where the
18 NRC is prepared to endorse it.

19 That being said, there are many examples
20 of NEI documents that the NRC doesn't endorse and the
21 licensees use effectively as guidance documents. NEI
22 02-03, which is a guide for doing 86-10 fire
23 protection deterministic evaluations, the NRC has
24 never endorsed that, but it has been useful. It
25 provides consistency in the licensees, and so forth.

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1 At some point, maybe this could get
2 endorsed, but at this point we are not -- to give
3 ourselves a grade, I think in a lot of areas we are
4 probably 95, give ourselves a 95 out of 100. I think
5 the amount of scrutiny and the work that we have done
6 on particularly Appendix E, we might have gotten a C.

7 Now I'm really mixing my metaphors.

8 But I recognize that this needs more work.

9 I believe the staff's position is sufficiently safe
10 and sufficiently clear to move forward.

11 MEMBER RAY: Can you indulge me? You
12 heard my effort to try to make it simple enough for
13 even me to understand the 10-minute issue, which you
14 referred to as the 10-minute criteria, and everybody
15 gets used to buzzwords.

16 Do you agree with the construct that we
17 came up with, which was the fire starts, some
18 indeterminate time later it is detected? Then there
19 is a 10-minute period during which no operator action
20 is assumed to occur. Then time zero occurs, and
21 operator action occurs after that. Do you draw it the
22 same way?

23 MR. FRUMKIN: I think I learned a lot
24 during this conversation about how that 10-minute
25 criteria is developed. So I really --

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1 MEMBER RAY: Okay. Well, let's just
2 assume that for right now you don't want to endorse
3 it.

4 MR. FRUMKIN: I think that the key
5 factors, in my judgment, are not this 10-minute
6 criteria, but it is, what is the fire damage; what is
7 the consequences, and then how long does it take to
8 respond effectively?

9 MEMBER RAY: Okay, but you referred to the
10 10 minutes. I still want to explore it a little bit.

11 MR. FRUMKIN: I don't believe that my
12 explanation of the 10 minutes is consistent with NEI's
13 explanation of the 10 minutes.

14 MEMBER RAY: All right, that's fine.
15 Thank you. So there's two versions of the 10 minutes.

16 But, for your understanding of it or the
17 way you would describe it anyway, is it better, more
18 conservative to make the 10 minutes shorter or longer?

19 I am having a hard time even figuring that out. In
20 other words, would it be better to make the 10 minutes
21 longer from the standpoint of being conservative in
22 the analysis or better to make it shorter?

23 MR. FRUMKIN: Right. My vision of this is
24 it's a race of the fire damage causes some sort of
25 transient, which is going to challenge safe shutdown.

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1 That racer, it just starts. We don't know exactly
2 where it starts.

3 The earliest it can start is at the
4 beginning of the fire. That is conservatively the
5 beginning of its track.

6 The operators, the soonest they can begin
7 is when they identify the fire. So there's a
8 potential -- there's a possibility that the damage and
9 the consequence could occur and be unrecoverable
10 before the operators even know there is a fire. We
11 think that is very rare.

12 MEMBER RAY: Right. Maybe 10 minutes
13 longer would be more conservative is the bottom line,
14 from your standpoint, because it would add to the time
15 before mitigation began?

16 MR. FRUMKIN: Right, but the real time
17 zero, and I think Steve Hutchins called it negative
18 zero, is the beginning of the fire.

19 MEMBER RAY: But John asked about what
20 defined time zero, because that is important to the
21 people who actually are engaged in this chaos we're
22 creating, apparently. So we will have to deliberate
23 on that.

24 John, did you have any more on that?

25 MEMBER STETKAR: No.

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1 MEMBER RAY: Because I am trying to fit
2 the time zero in with the 10 minutes that we are
3 talking about here.

4 CHAIR SIEBER: Well, the important thing
5 is, you know, you are talking about the time required
6 for operators to do things. Until they figure out
7 they've got to do something, you can't start the
8 clock.

9 On the other hand, the system may fail
10 beforehand, and then you have to protect it beyond the
11 operator actions. So, to me, that is conservative.

12 MEMBER STETKAR: Well, you have to be
13 careful because NUREG-1852 defines two times. It is
14 the amount of time available for the operator to do
15 something before things become bad, if I can
16 characterize it that way.

17 MEMBER BLEY: Which is highly uncertain.

18 MEMBER STETKAR: Which is highly
19 uncertain, and that time starts at some zero point
20 that must be defined.

21 Then there is the amount of time that is
22 required or necessary for the operators to implement
23 what they need to do. In other words, if I need to
24 walk with my bad hip from here to the Capitol
25 Building, it is going to take me a certain amount of

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1 time to do that. If I need to do that within 15
2 minutes, I can't do that.

3 And that time also begins at the same zero
4 point. So it is important to clearly define that zero
5 point for both of those analyses, the analysis that
6 determines the amount of time available, and then your
7 analysis that says, given these conditions, how much
8 time is required for the operators to decide what they
9 need to do and then go do it?

10 MEMBER RAY: But in this case, those two
11 periods don't start at the same point in time --

12 MEMBER STETKAR: Yes.

13 MEMBER RAY: -- because there is a lag. I
14 guess maybe I am dwelling on this because I think,
15 ultimately, when we get done, it may be important that
16 we clearly understand it.

17 I didn't bring up the 10 minutes. It was
18 brought up here. I am just trying to understand what
19 the heck it is --

20 MEMBER STETKAR: Yes.

21 MEMBER RAY: -- and what is causing the
22 analysts, who I used to manage, to assume. Do we all
23 understand it the same way? I still don't understand
24 it. I mean I understand what NEI said it was. I
25 don't know what it means particularly, but I

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1 understand at least what they said. I'm not sure what
2 we were commenting on here.

3 MEMBER BLEY: The real thing going on is
4 that we have a highly indeterminate situation, and
5 people have tried to come up with kind of crude
6 criteria that give us some confidence that they can do
7 what we say they can do within the time before things
8 break.

9 If you look at the whole basis of how you
10 would do this very precisely, even that you can't do
11 because in any case it is different.

12 MEMBER RAY: Well, yes, we have always
13 been faced with that dilemma, Dennis, but can you tell
14 me what the heck the disagreement fundamentally is
15 between the two sides on Appendix E? The only thing I
16 have here is this 10-minute criteria. That was what
17 was given as the reason why -- there are other
18 reasons, doubtless, but at least that was specified.
19 And I'm just trying to understand what it is.

20 If anybody knows, please tell me. I don't
21 know what it is. I don't know what the 10 minutes is.

22 CHAIR SIEBER: Well, somebody can say I'm
23 wrong, but I think I know. It is the time between the
24 onset of alarms, plant actions, what have you, that
25 alert the operator to the fact that he's got a fire,

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1 until he figures out, he assesses what is going on in
2 the plant and decides manual actions are necessary.

3 MEMBER RAY: Okay. Let me buy that
4 because that is exactly what NEI said it was. Now
5 they also defined time zero as at the end of the 10
6 minutes. I hear John saying it is going to be
7 different.

8 CHAIR SIEBER: That's right. That's
9 right.

10 MEMBER RAY: But, to me, if we are
11 disagreeing over that 10-minute period, I am trying to
12 understand why. Is that not enough time for people,
13 from the detection of an alarm to initiating action?
14 Is that why we disagree with it? That is what I am
15 trying to understand, Jack.

16 CHAIR SIEBER: Yes. Well, my thought is
17 that it does take a minute --

18 MEMBER RAY: I agree.

19 CHAIR SIEBER: -- perhaps 10 minutes, for
20 an operating crew to look at a bunch of alarms,
21 including the fire alarm --

22 MEMBER RAY: Yes.

23 CHAIR SIEBER: -- and handle some
24 immediate things, and decide he has to take a manual
25 action.

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1 MEMBER RAY: But my first reaction --

2 CHAIR SIEBER: I think it is conservative.

3 MEMBER RAY: -- is 10 minutes is enough
4 time. That would be my reaction.

5 CHAIR SIEBER: Yes.

6 MEMBER RAY: For that interval. So I am
7 believing these guys --

8 CHAIR SIEBER: Right.

9 MEMBER RAY: -- apply the 10 minutes to
10 something else. Because, you know, if you need more
11 than 10 minutes from the time the alarm comes in to
12 initiate action, I am wanting to know, well, why does
13 it take more than 10 minutes for that? I would be
14 very upset if that was what we were having --

15 MEMBER SHACK: If you read Appendix E, it
16 says time zero is 10 minutes after confirmation. Time
17 zero is the time at which fire damage to safe shutdown
18 occurs, needs to be defined.

19 MEMBER RAY: What does that mean to you,
20 Bill?

21 MEMBER SHACK: That means that I assume
22 that, after I have confirmation, I am saying that the
23 damage occurs to the components. At that point, I
24 start doing my analysis of how much time I have to do
25 a recovery action.

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1 MEMBER RAY: Okay. So 10 minutes may be
2 too much.

3 MEMBER SHACK: It may be too much.

4 MEMBER RAY: Yes. Yes, in that
5 sense -- Jack, hold on.

6 CHAIR SIEBER: Yes.

7 MEMBER RAY: In that sense, 10 minutes
8 could be too much, not not enough, because the damage
9 could have occurred at five minutes or one minute or
10 some other time.

11 So that's why I ask the question, is 10
12 minutes more conservative when it is short or more
13 conservative -- I mean, is the interval more
14 conservative when it is shorter than 10 minutes or
15 more conservative when it is longer than 10 minutes?

16 By what you just read, Bill, I would say,
17 well, it is more conservative if it is less than 10
18 minutes; whereas, if it is --

19 MEMBER BLEY: Conservative from the
20 viewpoint of what the fire is going to do.

21 MEMBER RAY: Yes.

22 MEMBER BLEY: It is not conservative from
23 the viewpoint of, can the people do it within that
24 time. The one thing you are forgetting, I believe --
25 I could be wrong, Harold -- is these manual actions

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1 aren't the first order of business when the plant
2 trips. The first order of business --

3 MEMBER RAY: No, no, I haven't forgotten
4 it.

5 MEMBER BLEY: The first order of business
6 is carrying out the emergency operating procedures.
7 If you look at some of the fires where they have to
8 play the fire procedures against the emergency
9 operating procedures, you can't turn the one loose to
10 do the other. So the emergency operating procedures
11 are moving on, and they have to break somebody off to
12 run the other part of it. Suddenly, a lot of time can
13 go by, and you can see cases where that has happened.

14 There's no this is more conservative than
15 that. This whole discussion of conservatism, as I
16 know --

17 MEMBER RAY: All right, I will take
18 conservative out of the discussion, and I haven't
19 forgotten that. But I just said, if it was more than
20 10 minutes, I wanted to know why. If the staff's view
21 was we need 15 or 20 minutes, I just wanted to know
22 why. That's all.

23 But what Bill read, to me, is something
24 different, which is you've got 10 minutes after the
25 detection before you have to assume damage that has

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1 failed the shutdown equipment.

2 MEMBER BLEY: By definition, in the
3 appendix. That's not quite related to reality.

4 MEMBER RAY: But, Dennis, my point is
5 that's a completely different understanding of the 10
6 minutes. I was only trying to understand what the 10
7 minutes was for.

8 MEMBER SHACK: We are not trying to say
9 good, bad, or just what.

10 MEMBER RAY: That's right. Jack was using
11 the word "conservative", and I was trying to say,
12 well, it's not clear to me which way is conservative.

13 CHAIR SIEBER: Well, it depends on which
14 way you take it. For example, here starts the
15 incident. Alarms come in some time later. Operators
16 figure it out, take care of necessary business, and
17 send somebody out. That defines a length of time that
18 is greater than an hour.

19 In the meantime, the plant's deteriorating
20 through that period. If it gets to the point where
21 operator manual actions in that one-hour-plus time
22 that is allowed is not effective, then you have to
23 consider it as safety-related as opposed to important
24 to safety, and apply greater protection to the --

25 MEMBER RAY: I believe, if you endorsed

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1 Appendix E, I think what it would mean is you don't
2 have to assume failure of components due to fire until
3 10 minutes after the alarm comes in. I think that's
4 what it means. And that's a big deal.

5 CHAIR SIEBER: That is different than what
6 I --

7 MEMBER RAY: You're darned right it is.

8 CHAIR SIEBER: Yes.

9 MEMBER RAY: I'm just trying to understand
10 it; that's all.

11 MR. FRUMKIN: Well, that was my
12 understanding --

13 MEMBER RAY: Okay.

14 MR. FRUMKIN: -- until NEI --

15 MEMBER RAY: Yes, but NEI gave a different
16 definition here a few minutes ago.

17 MEMBER SHACK: Well, it is all on page
18 E-3.

19 MR. SHACK: What is written, it is written
20 in the appendix.

21 MEMBER RAY: Yes, I think you're right,
22 what we have just now, with Bill's help, understood
23 what the 10 minutes really means.

24 MEMBER SHACK: Well, we understand what
25 E-3 says.

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1 (Laughter.)

2 MEMBER RAY: Yes, well, but that's where
3 it comes from. That was the starting point for my
4 question.

5 MR. FRUMKIN: And NUREG-1852 has a very
6 nice appendix that spells out how these timelines can
7 be done, and done effectively. In fact, some of our
8 licensee exemptions for manual actions go through and
9 they draw all these timelines very nicely. It is very
10 clear what they are trying to get at.

11 So I think that we have the information
12 out there. Licensees understand how to do it. We are
13 doing some reviews. We are going to learn a little
14 bit from those reviews.

15 But the staff position is we know what we
16 are doing with these manual actions.

17 MEMBER RAY: To be fair to NEI, it may
18 have been that that's what they meant when they said
19 time zero was at the end of the 10 minutes --

20 CHAIR SIEBER: Yes.

21 MEMBER RAY: -- and I just didn't
22 understand it correctly.

23 CHAIR SIEBER: Okay, any other questions
24 to the staff?

25 MEMBER STETKAR: I have a question. It is

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1 not particularly to the staff, Jack, but it is to NEI.

2 CHAIR SIEBER: Okay.

3 MEMBER STETKAR: As long as the staff is
4 up here, and you can say, no, you don't want to answer
5 it, and that's fine.

6 CHAIR SIEBER: They can do that.

7 MEMBER STETKAR: Of these three open items
8 that we have been discussing here, does NEI have a
9 priority list in terms of which of those three -- I
10 know you want all three of them fully endorsed in the
11 Reg Guide, but is there one that is particularly more
12 beneficial or higher priority for you compared to the
13 other two?

14 MR. GORMAN: Tom Gorman, NEI and PPL.

15 Yes, I would say that our third open item
16 would be our priority 1. Our first open item would be
17 priority 2, and our second open item would be priority
18 3. So that means the non-latching cables, I would say
19 one. Endorsement of Appendix E would be No. 2. Then
20 the duration of the hot shorts would be three.

21 I think on the duration of the hot short,
22 I think we will eventually get to a number as a result
23 of the DC testing. We just picked 20 minutes because
24 that was the information that was available and the
25 expert panels and everything for the AC testing.

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1 MEMBER STETKAR: But, I mean, all things
2 being equal in terms of where you feel the Reg Guide
3 would reduce the amount of, you used the word "chaos",
4 so I'll use chaos, in your analyses, they appear
5 prioritized in order?

6 MR. GORMAN: Yes.

7 MEMBER STETKAR: Okay. Thanks. That
8 helps.

9 CHAIR SIEBER: Is there not a chaos
10 theory?

11 (Laughter.)

12 MEMBER STETKAR: There is, but it is
13 chaotic.

14 (Laughter.)

15 MEMBER SHACK: On item three, do you see
16 any difference between grounded circuits and
17 ungrounded circuits?

18 MR. FRUMKIN: The original CAROLFIRE
19 testing indicated that AC ungrounded circuits would
20 perform the same as AC grounded circuits.

21 MEMBER SHACK: Right.

22 MR. FRUMKIN: With regard to DC circuits,
23 either whether they are grounded or ungrounded, I
24 think that is being tested.

25 MR. BARRETT: This is Harry Barrett.

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1 The only difference that grounded and
2 ungrounded makes is with armored cable. If you have a
3 grounded circuit with armored cable, you are more than
4 likely not going to have a spurious actuation because
5 it is very likely that it is going to ground to the
6 armor.

7 Ungrounded circuits or grounded circuits,
8 it is still the same electrical physics that goes on.

9 So, as far as the hot short --

10 MEMBER SHACK: So, if you were going to
11 make an exception, you would make the exception only
12 for the grounded armored cable?

13 MR. BARRETT: Yes, that would be the only
14 exception.

15 CHAIR SIEBER: Which is pretty rarely
16 used, right?

17 MEMBER SHACK: And your resolution to this
18 is we just have to go back to an exemption based on a
19 risk-based analysis?

20 MR. BARRETT: It depends on the utility.
21 Duke uses it extensively. All of their plants have
22 armored cable, but other utilities don't use it as
23 much.

24 CHAIR SIEBER: Yes, I don't recall using
25 it. Okay.

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1 MEMBER SHACK: Would you be willing to
2 revise 1.189 to cover grounded armored cables?

3 MR. FRUMKIN: We could do that. I guess
4 the issue with the grounded cable is that I believe it
5 is more the public availability of the testing. It
6 hasn't been released, and it would be hard to defend
7 that without having that information out.

8 But the staff has that testing. The
9 industry has that testing. So, I mean, we would be on
10 a level playing field if we had that discussion for
11 the Duke plants, which are all going to NFPA 805.

12 (Laughter.)

13 So it becomes a fairly moot point, I
14 think.

15 CHAIR SIEBER: Any additional questions
16 from members?

17 (No response.)

18 Okay. Thank you very much.

19 What I would like to do now in the few
20 minutes that we have remaining is that we will have a
21 session at the full Committee meeting because the full
22 Committee voted to hear this subject. An outcome of
23 the full Committee could be an ACRS letter, and I will
24 need your help in preparing the first draft.

25 So what I would like to do is go around

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1 the table and have you provide what your comments are,
2 No. 1, and secondly, if you have a proposed conclusion
3 or recommendation that should be in that letter, tell
4 me what it is.

5 Dennis, I will start with you.

6 MEMBER BLEY: I am not ready to say I have
7 a conclusion yet, but I think this goes a pretty good
8 way at giving a reasonable solution to a very
9 difficult and indeterminate problem. I want to think
10 a little bit more about it before I say something more
11 definitive.

12 CHAIR SIEBER: Okay. Anything else?
13 Bill?

14 MEMBER SHACK: I am going with Dennis. I
15 like that. They made a lot of progress. Whether I'm
16 ready to say that now is the time to start the clock
17 ticking, which is what you were really talking
18 about --

19 MEMBER BLEY: That's right.

20 MEMBER SHACK: I am actually impressed by
21 the amount of progress that has been made. But
22 whether we have to start the clock ticking now or
23 there is some possibility, I think that is the same
24 that needs to be addressed a little bit, is whether --
25 you know, Dan is making the case that the testing is

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1 not going to change regulatory positions.

2 If upon reflection at the full Committee
3 he is ready to really stand by that statement, then I
4 think I would be willing to go ahead with it. But I
5 would like them at least to think about that position
6 a little harder, whether they really think it is very
7 unlikely that the testing will change the regulatory
8 positions.

9 CHAIR SIEBER: Okay. John?

10 MEMBER STETKAR: I think I will echo
11 Dennis and Bill. It has been pretty obvious that I
12 have some concerns regarding the implicit or explicit
13 time criteria for manual actions, but I don't want to
14 raise that as a particular concern at the moment in
15 terms of endorsing or not endorsing the Reg Guide
16 because I really need to think a little bit more about
17 what I have heard today and how that might be applied
18 in practice. So that is all I have to say, I think.

19 CHAIR SIEBER: Okay. Said?

20 MEMBER ABDEL-KHALIK: I agree with my
21 colleagues.

22 CHAIR SIEBER: Okay. Harold?

23 MEMBER RAY: Likewise, I hate to be so
24 opaque, but at the end of the day we are setting
25 groundrules for people to do analyses, and that means

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1 that assumptions have to be deemed reasonable and
2 specified.

3 The exchange we had, for example, on the
4 subject of -- John referred to it as operator actions.

5 I talked about it as the 10-minute business. But
6 what the implication of that is, to me, is
7 indefensible on the one hand, but on the other hand,
8 you have to make some assumption, and is that a
9 reasonable assumption to make? Perhaps it is.

10 I need some more time to reflect on that.

11 MEMBER SHACK: There is a justification
12 for the 10 minutes on E-4.

13 MEMBER RAY: Okay. I mean I realize you
14 can't leave it. You can't have no guidance. So, as I
15 sit here and think about it, I wish we could -- this
16 isn't the time to attempt to do it, but I wish we
17 could say, well, what should be assumed?

18 MEMBER SHACK: Well, I mean, they do have
19 1852, which I think is less arbitrary. It asks you to
20 look at a situation by situation and an expert kind of
21 panel thing. I think that's the real decision: can
22 you make blanket rules or do you really have to look
23 at these almost case by case?

24 MEMBER RAY: The question at hand, though,
25 is, how long after the fire starts should you assume

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1 this damage condition is created? That I don't
2 believe we have talked about at all. I don't have any
3 clue what a reasonable assumption is because somewhere
4 in there you have the detection point occur.

5 We are really talking about how long after
6 detection before damage. Well, God, I don't know
7 because I don't know what basis to assume from the
8 start of the fire to detection.

9 CHAIR SIEBER: Well, the difficulty is you
10 have detection and suppression in your fire alarm
11 system.

12 MEMBER RAY: Yes, I know.

13 CHAIR SIEBER: That would be a clue, but
14 another clue is when the first fault occurs, and the
15 plant responds to that.

16 MEMBER RAY: I guess what I am trying to
17 say is, Jack, I can reason through a conclusion that
18 10 minutes after detection before damage is not an
19 unreasonable thing for purposes of analysis. I can
20 reason that. But is it right? I don't know. That's
21 why I hesitate right now to tell you what my
22 conclusions would be on this.

23 CHAIR SIEBER: Just getting beyond that,
24 you can't tell an operator to do something until
25 something fails.

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1 MEMBER BLEY: You've got to have an
2 indication.

3 CHAIR SIEBER: The fire alarm system, the
4 detection and suppression --

5 MEMBER RAY: That's key.

6 CHAIR SIEBER: -- part of it, all it does
7 is say send a fire brigade.

8 MEMBER RAY: Yes, and that's why I can't,
9 just off the top of my head, come to some conclusion
10 about that. It is important. It is the No. 1 item
11 maybe in importance.

12 So I'm sorry, but I just have to tell you
13 I need to think about this some more.

14 CHAIR SIEBER: Okay. Now let me ask this
15 question of you: are you concerned more about when
16 the 10 minutes starts or the fact that it is 10
17 minutes and not 12 or 5, or both, or neither?

18 MEMBER RAY: Well, no, no, no. I am
19 trying to be responsive. I would say I am probably
20 concerned about the length of time assumed because
21 maybe it should be zero. I honestly don't know.

22 Because I haven't had to do this for a
23 long time, and when I did have to do it, I didn't have
24 to do the multiple spurious actuation exercise. So I
25 apologize, but I can't tell you what I would put in a

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1 letter, if we were going to write it today, because I
2 haven't thought about it enough.

3 CHAIR SIEBER: Okay. Well, I guess it is
4 up to me to think about it then.

5 (Laughter.)

6 MEMBER BLEY: I'm sure we're all going to
7 think about it, Jack.

8 CHAIR SIEBER: Everyone has my email
9 address.

10 Well, I actually think we had a very
11 productive meeting. I thank the staff, not only for
12 today's presentation, but for 30 years of work leading
13 up to it.

14 I also thank NEI. I think the work you
15 did to assist the staff was valuable. I think your
16 comments were valuable.

17 I also think the staff and its working
18 with industry was productive in this area. We note
19 that the testing, fire testing of cables, was not
20 complete. We have to ponder whether it is complete
21 enough to reach the conclusion that its completion
22 will not change the outcome.

23 So, with that, I actually very much
24 appreciate the staff's work and NEI's work, and their
25 associated utilities, and also the members for asking

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1 difficult, detailed questions, which helped me in
2 understanding.

3 So, with that, we will conclude the
4 meeting six minutes earlier.

5 Thank you very much.

6 (Whereupon, at 11:52 a.m., the above-
7 entitled matter was adjourned.)
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MEETING OF THE SUBCOMMITTEE ON PLANT OPERATIONS AND FIRE PROTECTION

Reg Guide 1.189, Revision 2

DG-1214

Industry Comments

Tom Gorman, PPL



Agenda

- History
- Role of NEI 00-01 Rev 2
- Interface with Regulatory Guide 1.189 Revision 2
- Open Items
- Conclusions



History

- SECY-06-0196 – Issuance of GL 2006-XX, "Post-Fire Safe-Shutdown Circuits Analysis Spurious Actuations" was disapproved by the Commission because "Licensees should not be required to perform analysis for which no clear accepted regulatory guidance exists."
- When the Commission disapproved the GL, it also required the Industry and the NRC to "Develop or endorse guidelines that provide a clearly defined method for the operating plants to determine compliance."
- As requested, the Industry and the NRC Staff have been holding Public Meetings in an effort to establish an acceptable "resolution methodology" for determining compliance



Role of NEI 00-01, Rev 2

- Written to provide the Industry with clear guidance for performing a Post-Fire Safe Shutdown Circuit Analysis
- Establishes a uniform methodology, using a Generic Multiple Spurious Operations List and an Expert Panel Review Process.
- Draft provided to the Industry and the NRC Staff for review in December of 2008.
- NEI 00-01 Revision 2 issued for Industry use in May 2009.



Interface with Regulatory Guide 1.189, Rev 2

- Issued as DG-1214 in April 2009
- Comments provided by the Industry.
 - Recommended that the guidance incorporate references to the appropriate sections of NEI 00-01, Rev. 2 to provide a consistent and comprehensive approach and minimize ambiguity
 - Sections of DG-1214 were found to be in conflict with RIS 2005-30. NEI recommended that RIS 2005-30 be retracted.
- NRC Response to Industry Comments
 - Most comments have been accepted
 - A few Open Items remain



Open Items

1. NEI 00-01, Appendix E - Operator Manual Actions (OMAs):
 - a) NRC prefers the approach for reliability spelled out in NUREG 1852 rather than Appendix E and is considering not endorsing Appendix E in the Reg Guide.
 - b) NEI's position is:
 - i. Appendix E does reference the use of NUREG 1852 for new OMAs requiring NRC acceptance
 - ii. The criteria contained in Appendix E is consistent with the criteria historically applied to and accepted for existing OMAs and with the longstanding criteria contained in the NRC Inspection Module for evaluating the acceptability of OMAs used in support of Post-Fire Safe Shutdown.
 - iii. Appendix E is needed because NUREG 1852 does not provide many of the required clarifications contained in Appendix E.
 - iv. **NRC should endorse Appendix E in RG 1.189, Rev.2** and, if necessary, provide an exception for reliability.



Open items

2. 20 minute duration for hot shorts:

- a) NRC is concerned about endorsing a hot short duration of 20 minutes until the DC Circuit Cable Fire Testing is completed.
- b) NEI position:
 - i. All cable fire testing completed to date has shown that the hot short duration is significantly less than 20 minutes. The 20 minute hot short duration provides a clear criteria with adequate margin to the tested values.
 - ii. **RG 1.189, Rev 2 should endorse the position taken in NEI 00-01 Rev.2**, revised to state: “NRC agrees that a 20 minute duration for hot shorts on grounded circuits is acceptable. This duration for hot shorts will be revised, if necessary, based on the results of the ongoing ungrounded dc circuit testing.”
 - iii. As an alternative, the issuance of RG 1.189 could be deferred until the dc circuit testing is completed and this open item is resolved.

Open Items

3. Non-concurrent hot shorts in separate non-seal-in/non-latching cables:
 - a) NRC is concerned about endorsing this criteria claiming it is risk based.
 - b) NEI position:
 - i. This criteria does not apply to circuits for components required for hot shutdown.
 - ii. In both the NEI/EPRI and CAROLFIRE Cable Testing concurrent hot shorts in separate cables in the same test occurred in only 1 out of 120 potential cases.
 - iii. A limit needs to be established to avoid introducing chaos into the analysis. This limit, when coupled with the defense-in-depth Fire Protection Program, provides reasonable assurance of a safe plant design.
 - iv. Completion of the dc circuit testing will provide additional insights related to this criteria.
 - v. **RG 1.189, Rev 2 should endorse the position taken in NEI 00-01 Rev.2**, revised to state: “NRC agrees that this criterion for hot shorts on grounded circuits is acceptable. This criteria as it applies to ungrounded circuits will be revised, if necessary, based on the results of the ongoing ungrounded dc circuit testing.”
 - vi. As an alternate, the issuance of RG 1.189 could be deferred until the dc circuit testing is completed and this open item is resolved.

Conclusion

- The Commission direction provided in SECY-06-0196 has been satisfied, with limited exceptions.
 - A clearly defined method has been defined in NEI 00-01, Rev. 2
 - A clear regulatory acceptance exists when RG 1.189, Rev. 2, references NEI 00-01, Rev. 2
 - Completion and Evaluation of the ongoing dc circuit testing and resolution of the open items discussed earlier is required to fully satisfy the Commission direction.
- Plant Re-analysis should be deferred until the Commission direction is fully satisfied.
 - Once results of the DC Circuit Test have been evaluated and all open items are resolved, NEI 00-01 can be revised to incorporate final resolutions.
 - Eliminates need to re-perform this costly analysis.





Daniel Frumkin

Fire Protection Branch

Division of Risk Assessment

Office of Nuclear Reactor Regulation

DG-1214, Fire Protection for Nuclear Power Plants

ACRS Subcommittee

August 18, 2009

Topics

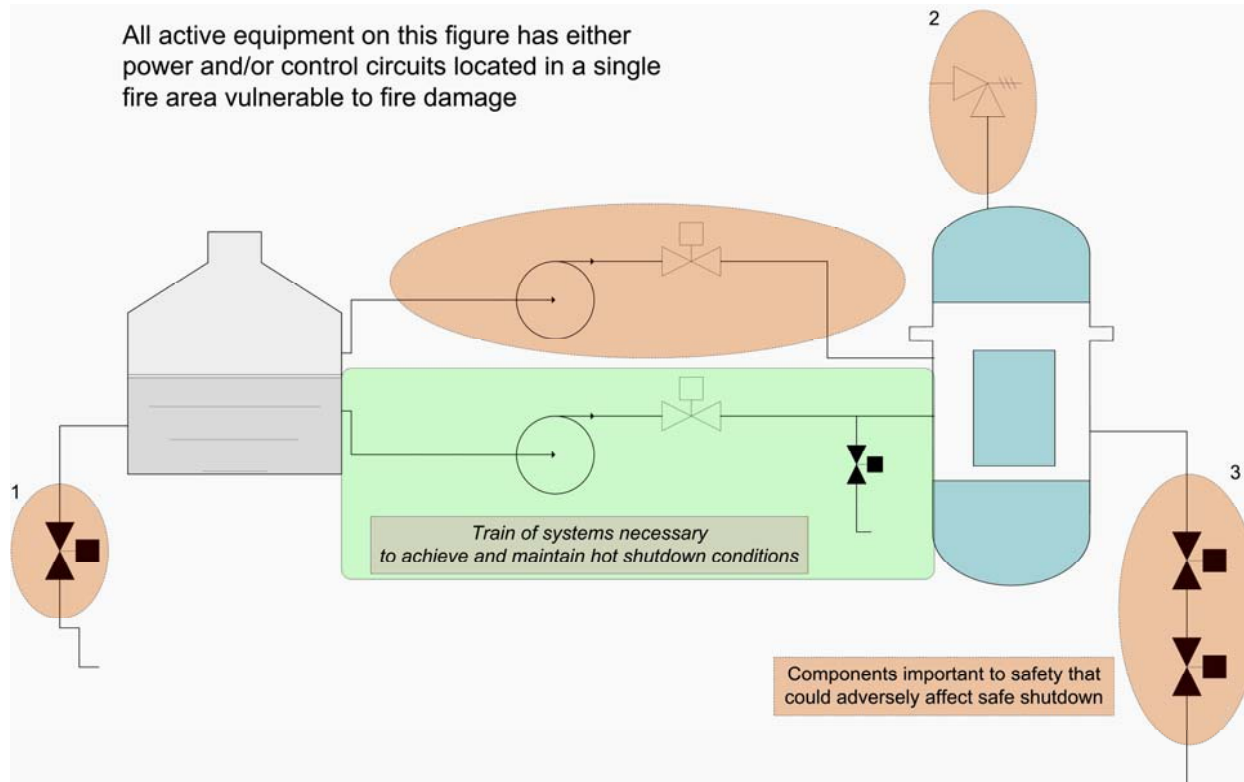
- Background
- Changes
- Public comments
- Public comments not incorporated
- Path forward

Background (1)

- Proposed resolution to multiple spurious actuations in SECY 06-0196, "Issuance of Generic Letter 2006-xx, "Post-Fire Safe-Shutdown Circuits Analysis Spurious Actuations"
- SRM/SECY 06-0196:
 - "The present draft of the proposed Generic Letter does not contain the necessary specificity for a licensee to understand what process will be sufficient to meet the analysis needs and information demands of the draft Generic Letter"
 - "The staff should examine licensee analysis methods in this area, including those using system or functional scenario development approaches, and using the normal public regulatory process to enable stakeholder engagement, develop or endorse guidelines that provide a clearly defined method of compliance for licensees who do not choose to utilize the risk-informed approach contained in 10 CFR 50.48(c)."

Background (2)

- SECY 08-0093, "Resolution of Issues Related to Fire-Induced Circuit Failures."



Background (3)

- Two categories of equipment were identified in SECY 08-0093:
 - Safe Shutdown Success Path
 - Also “Green Box” or “Components Required for Hot Shutdown”
 - Components Important to Safe Shutdown
 - Also “Orange Box”
- Although both require protection – only Safe Shutdown Success Path Components require Appendix R, III.G.2 protection

Changes in Draft Guide (1)

- The NRC initiated changes relate to Regulatory Position C.5 of the Guide. These changes include discussions of:
 - Safe shutdown success path components and components important to safety
 - Use of manual actions and fire modeling for assessing components important to safe shutdown
 - Examples of the safe shutdown success path components and important to safe shutdown components

Public Comments

- Three industry stakeholders provided comments
- Many comments were editorial in nature and, in the view of the NRC staff, improved the document and therefore were incorporated
- Industry stakeholders commented that NEI 00-01, Revision 2 should be reference in the guide – this comment was consistent with Commission direction and was done except as explained below

Public Comments Not Incorporated (1)

- Appendix E of NEI 00-01 – Operator Manual Actions
 - Reasons for non-incorporation
 - Lack of incorporation of NRC staff comment on assumption that there will be 10 minute criteria
 - Lack of clear discussion on reliability of manual actions
 - Path Forward
 - NUREG-1852 provides information useful for evaluating post-fire operator manual actions
 - Additional information has been added to the guide regarding manual actions
 - Fire modeling may be used to demonstrate that a manual action is not necessary to mitigate spurious actuations of components important to safe shutdown

Public Comments Not Incorporated (2)

- NRC staff endorsement of 20 minute duration of direct current hot shorts from NEI 00-01, for components important to safe shutdown
 - Reason for non-incorporation
 - The state of testing does not support the 20 minute duration for direct current (DC) circuit faults
 - Path Forward
 - NRC plans to endorse 20 minute duration for alternating current (AC) circuits
 - Although current testing is not complete – preliminary results indicate that 20 minute hot short duration for DC circuits may still not be a valid assumption
 - Other options – manual actions, fire modeling are available to evaluate the components important to safe shutdown

Public Comments Not Incorporated (3)

- NRC staff endorsement of limitations on concurrent hot shorts from NEI 00-01, for components important to safe shutdown
 - Reason for non-incorporation
 - These limitations rely on risk-informed assumptions, therefore, this wouldn't be appropriate for DG-1214, which is not formally risk-informed
 - Path Forward
 - Risk options are available in R.G. 1.174, this would involve submittal of an exemption or license amendment
 - Other options such as manual actions and fire modeling are available

Public Comments Not Incorporated (4)

- Numerous other comments were considered and either accepted, accepted in part, or not accepted. Some themes that repeat in these other comments that were not incorporated are:
 - The guide does not supersede a plants approved fire protection program
 - Guidance is located elsewhere in the guide
 - There are means available to deviate from the guidance in the guide

Public Comments Not Incorporated (5)

- The NRC staff view is that there is sufficient guidance or alternatives available for licensees to complete fire induced circuit analyses
- A variety of analysis methods are available that would allow licensees to avoid modifications to resolve non-safety significant circuit analysis issues
- 10 CFR 50.48(c) – NFPA 805, is also an option for licensees
- NRC staff will continue to work with industry regarding refining the implementing guidance for the open issues, but this refinement is not necessary to fulfill the Commission's direction regarding a clearly defined method of compliance

Path Forward

- Issuance of the Final Regulatory Guide 1.189 is planned for the fourth quarter of 2009
- Issuance of R.G. 1.189, will start the “clock” on Enforcement Guidance Memorandum (EGM) 09-002:
 - Licensees will have six months to identify noncompliances
 - And an additional 30 months to resolve those noncompliances
- The NRC will revise its inspection manual to assure that licensees are appropriately implementing the clarification described in RG 1.189