



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, DC 20555 - 0001**

May 20, 2015

MEMORANDUM TO: ACRS Members

FROM: Kathy D. Weaver, Senior Staff Engineer / **RA** /
Reactor Safety Branch A, ACRS

SUBJECT: CERTIFICATION OF THE MINUTES FOR THE FUKUSHIMA
SUBCOMMITTEE MEETING ON MAY 6, 2015, ROCKVILLE,
MARYLAND

The minutes of the subject meeting were certified on May 15, 2015, as the official record of the proceedings of that meeting. A copy of the certified minutes is attached.

Attachment: As stated

cc with Attachment: E. Hackett
 M. Banks



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, DC 20555 - 0001**

MEMORANDUM TO: Kathy D. Weaver, Senior Staff Engineer
Reactor Safety Branch A, ACRS

FROM: Dr. Stephen Schultz, Chairman
Fukushima Subcommittee

SUBJECT: CERTIFICATION OF MINUTES FOR THE ACRS FUKUSHIMA
SUBCOMMITTEE MEETING ON MAY 6, 2015, ROCKVILLE,
MARYLAND

I hereby certify, to the best of my knowledge and belief, that the minutes of the subject meeting on May 6, 2015, are an accurate record of the proceedings for that meeting.

/RA/

May 15, 2015

Dr. Stephen Schultz
Fukushima Subcommittee Chairman

Date

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
MINUTES OF THE ACRS FUKUSHIMA SUBCOMMITTEE MEETING
MAY 6, 2015

The ACRS Fukushima Subcommittee held a meeting on May 6, 2015 in Room T-2B3, 11545 Rockville Pike, Rockville, Maryland. The meeting convened at 8:30 a.m. and adjourned at 4:49 p.m. The entire meeting was opened to the public.

ATTENDEES/PRESENTERS

ACRS Members/ Staff

Stephen Schultz, Chairman
Ron Ballinger, Member
Dennis Bley, Member
Charles Brown, Member
Michael Corradini, Member
Dana Powers, Member
Peter Riccardella, Member
Michael Ryan, Member
Gordon Skillman (by telephone), Member
John Stetkar, Member
Harold Ray, Member
William Shack, Consultant
Kathy Weaver, ACRS Staff, DFO
Weidong Wang, ACRS Staff, DFO

Other Attendees

Phil Amway, Exelon Nuclear
Clinton Ashley, NRO/DSRA
Rajender Auluck, NRR/JLD
Scott Bauer, NEI
James Bonfiglio, AREVA
Eric Bowman, NRR/JLD
Randy Bunt, Southern Company
Mark Caruso, NRO/DSRA
Paul Driehaus, Exelon Nuclear
Hossein Esmaili, RES/DSA
Bryan Ford, Entergy Nuclear 3
Jeff Gabor, ERIN
Nageswara Kariipineni, NRR/DSS
Tim Kolb, NRR/DIRS
Steven Kraft, NEI
Walt Lee, TVA Nuclear
Roy Linthicum, PWROG RMSC
John McKirgan, NRO/DSRA
Milt Murray, NSIR/DPR

Nick Pappas, Palo Verde
Marie Pohida, NRO/DSRA
Michael Powell, Palo Verde
William Reckley, NRR/JLD
Timothy Reed, NRR/DPR
Jeffrey Schmidt, NRO/DSRA
David Young, NEI

SUMMARY

The purpose of the meeting was to hear presentations and discuss the information in the three draft regulatory guides and the NEI technical reports that support the proposed rule for mitigation of beyond design basis events. The committee also discussed with the staff and industry the final versions of the interim staff guidance on reliable hardened containment vents for BWR Mark I and Mark II designs and the related NEI supporting document.

The following table lists the significant issues that were discussed during the meeting with the corresponding pages in the transcript.

Significant Issues	Reference Pages in Transcripts
<p>Member Stetkar asked if the industry was going to get rid of the EDMGs completely? He asked NEI why do you need yet another set of procedures to confuse the operators? Member Stetkar explained that these guidelines were built for a presumed stylized set of regulatory compliance conditions that was negotiated with the staff, but is an artificial condition. He further asked why do we need to constrain ourselves to these artificial rules, given that we are taking a holistic, flexible strategy toward dealing with things outside of the procedures. Mr. Young from NEI responded that it is regulatory compliance.</p> <p>Member Stetkar further questioned why the industry is not trying to address this in a holistic sense rather than saying: "We are not going to because that is a regulatory compliance issue"?</p> <p>There was much more discussion on SAMGs, EDMGs, FSGs, AOPs, EOPs, and Fire Response Procedures. There was still much disagreement about the potential confusion operators could experience due to the several different response procedures that may need to be used during real events.</p>	<p>22 – 25</p> <p>25 - 77</p>
<p>There was much discussion regarding the EP position of Ultimate Decision Maker and whether that position should require an active Senior Reactor Operator license. Member Stetkar asked what is the downside of requiring the EP position of Ultimate Decision Maker to have an active SRO license that he or she keeps up to date? Mr. Young of NEI stated that "And part of that is, you limit your pool for site emergency directors"</p>	<p>38-45 77-88</p>
<p>Member Stetkar had questions regarding the arrival time of the ERO staff in 6 hours and actually having the staff to be able to do what is necessary during an event. Mr. Young of NEI indicated that there would be enough staff that you could support the implementation of the mitigating strategies.</p>	<p>104 – 106</p>
<p>Scott Bauer of NEI discussed that "One of the big issues facing all of us right now is what to implement or how to update the NEI 12-06 document to deal with the reevaluated flood and seismic hazards. He described that NEI has developed an Appendix G that deals with the reevaluated flood hazard and is currently undergoing review by NRC. Mr. Bauer further discussed that there is going to be a series of public meetings in the next few months to look at how to deal with the reevaluated flood hazard. He stated that "the reevaluated seismic hazard is not anywhere near that level of completion." He stated that "We're in formative discussions just about how to even approach the reevaluated seismic hazard, which would eventually be Appendix H for the document." Mr. Bauer indicated that a public meeting is anticipated in mid/late-May to basically come to a final determination or to say here's what we have.</p>	<p>149 - 154</p>

Mr. Bauer summarized the remaining issues to deal with regarding NEI 12-06 which includes: the generic questions on reactor coolant pump seals and NOTRUMP code, maintenance rule resolution, and Appendix G and H.	156
<p>There was much discussion about the regulatory guidance in DG-1301, Appendix A for new reactors regarding SSCs relied on during Phase 1 following an external event. Member Stetkar gave an example that the emergency diesel generators installed at a plant are assumed to fail although they meet the requirements from the guidance in Appendix A for the newly installed equipment required for Phase 1. Member Stetkar quoted the guidance in Appendix A which states that "the AC source distribution system and necessary load should be protected per Section 3.2 of this appendix." Member Stetkar further read from Section 3.2, which states that "SSCs relied on during Phase 1 should be protected to safety-related criteria; e.g., Seismic Category 1 and flood protection in accordance with Regulatory Guide 1.102, Flood Protection for Nuclear Power Plants, to be capable of performing the intended safety functions during and following the external event. SSCs and equipment relied upon during Phase 1 should be protected from all external events regardless of the warning time." Member Stetkar commented that it sounds like all of the emergency diesel generators satisfy that criterion. Member Stetkar again quoted from Appendix A which further states that "For seismic events the applicant may propose an alternative approach to ensuring a level of protection consistent with a site hazard including a safety margin to demonstrate that the overall high confidence of low-probability of failure is equal to or less than one percent at the site-hazard times a margin factor, GMRS times 1.67, which is consistent with that used in the plant design assessment." Member Stetkar stated "But it sounds to me like as long as I put this diesel in and qualify it for Seismic Category 1 and meet the Reg Guide 1.102 flood protection, which I've already met for all of my safety-related diesels, which are already by definition failed by this external hazard -- by definition this additional one survives. Why is that and why does the staff accept that? A lengthy discussion on this topic between the Committee and staff ensued. At the conclusion, several members recommended that the expectations in the guidance should be logical and presented clearly. The staff agreed.</p>	<p>214 – 215</p> <p>214 – 227</p>
Member Corradini commented that the process of using or integrating all the different procedures and determining how they all fit together is confusing. Perhaps a tabletop demonstration of their use would be beneficial to the Committee. Mr. Kraft explained that NEI staff thought a tabletop exercise in the ACRS conference room with the use of the video screens would be very valuable in helping members understand how all the procedure integrate or fit together.	276-277
Member Stetkar summarized his comments regarding the notion of integration of the guidance, both in the sense of integrating the paper guidance, that is characterized as the FLEX support guidance, SAMGs and EDMGs. He further commented that as one considers fire, flooding, or other related procedures, we need to make sure that we're not somehow making life more complicated for the operators or decision-makers, including the offsite response organization.	313-314

DOCUMENTS PROVIDED TO THE SUBCOMMITTEE

The following documents were provided to the members prior to the meeting:

Supporting Documents

- I. Nuclear Energy Institute (NEI) Technical Report NEI 12-01, "Guidelines for Assessing Beyond-Design-Basis Accident Response Staffing and Communication capabilities," Revision 0 dated May 2012, (ML15027A542)
- II. NEI Technical Report NEI 13-06, "Enhancements to Emergency Response Capabilities for Beyond-Design-Basis Accidents and Events," Revision 0, dated September 2014, (ML14269A230)
- III. NEI Technical Report NEI 14-01, "Emergency Response Procedures and Guidelines for Beyond-Design-Basis Events and Severe Accidents," Revision 0, dated September 2014, (ML14049A005)
- IV. NEI Technical Report NEI 12-06, "Diverse and flexible Coping strategies (FLEX) Implementation Guide," Revision 1 C, dated January 26, 2015, (ML15027A542)
- V. NRC Draft Regulatory Guide (DG)-1301 (proposed RG 1.226) "Flexible Mitigation Strategies for Beyond-Design-Basis Events," (ML15072A171)
- VI. NRC Draft Regulatory Guide (DG)-1317 (proposed RG 1.227), "Wide-Range spent Fuel Pool Level Instrumentation," dated March 2015, (ML15068A325)
- VII. NRC Draft Regulatory Guide (DG)-1319 (proposed RG 1.228), "Integrated Response Capabilities for Beyond-Design-Basis Events," dated March 2015 (ML15068A328)
- VIII. NEI Technical Report NEI 13-02, "Industry Guidance for Compliance with Order EA -13-109 – BWR Mark I&II Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions," Rev. 0E2, dated December 2014
- IX. JLD-ISG-2015-01 (Draft) Compliance with Phase 2 of Order EA-13-109, Order Modifying Licenses with Regard to Reliable Hardened Containment Vents capable of Operation under Severe Accident Conditions, draft dated March 2015 (ML15051A143)
- X. Letter to The Honorable Stephen G. Burns, NRC Chairman, from John W. Stetkar, ACRS Chairman, dated April 22, 2015, Subject – Draft SECY Paper, "Proposed Rulemaking: Mitigation of Beyond-Design-Basis Events (RIN 3150-AJ49)" (ML15111A271)

Official Transcript of Proceedings

NUCLEAR REGULATORY COMMISSION

Title: Advisory Committee on Reactor Safeguards
 Fukushima Subcommittee

Docket Number: (n/a)

Location: Rockville, Maryland

Date: Wednesday, May 6, 2015

Work Order No.: NRC-1551

Pages 1-320

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UNITED STATES OF AMERICA
 NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

(ACRS)

+ + + + +

FUKUSHIMA SUBCOMMITTEE

+ + + + +

WEDNESDAY

MAY 6, 2015

+ + + + +

ROCKVILLE, MARYLAND

+ + + + +

The Subcommittee met at the Nuclear
 Regulatory Commission, Two White Flint North, Room
 T2B1, 11545 Rockville Pike, at 8:30 a.m., Stephen P.
 Schultz, Chairman, presiding.

COMMITTEE MEMBERS:

STEPHEN P. SCHULTZ, Meeting Chairman

RONALD G. BALLINGER, Member

DENNIS C. BLEY, Member

CHARLES H. BROWN, JR. Member

MICHAEL L. CORRADINI, Member

DANA A. POWERS, Member

HAROLD B. RAY, Member

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PETER C. RICCARDELLA, Member

MICHAEL T. RYAN, Member

GORDON R. SKILLMAN, Member*

JOHN W. STETKAR, Member

ACRS CONSULTANT:

WILLIAM J. SHACK

DESIGNATED FEDERAL OFFICIALS:

KATHY D. WEAVER

WEIDONG WANG

ALSO PRESENT:

EDWIN M. HACKETT, Executive Director, ACRS

PHIL AMWAY, Exelon Nuclear

CLINTON L. ASHLEY, NRO/DSRA

RAJENDER AULUCK, NRR/JLD

SCOTT BAUER, NEI

JAMES BONFIGLIO, AREVA

ERIC E. BOWMAN, NRR/JLD

RANDY BUNT, Southern Company

MARK A. CARUSO, NRO/DSRA

PAUL DRIEHAUS, Exelon Nuclear

HOSSEIN ESMAILI, RES/DSA

BRYAN FORD, Entergy Nuclear

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TIM KOLB, NRR/DIRS
STEVEN P. KRAFT, NEI
WALT LEE, TVA Nuclear
ROY LINTHICUM, PWROG RMSC
JOHN B. MCKIRGAN, NRO/DSRA
MILT MURRAY, NSIR/DPR
NICK PAPPAS, Palo Verde
MARIE A. POHIDA, NRO/DSRA
MICHAEL POWELL, Palo Verde
WILLIAM D. RECKLEY, NRR/JLD
TIMOTHY A. REED, NRR/DPR
JEFFREY S. SCHMIDT, NRO/DSRA
BILL WILLIAMSON*
DAVID YOUNG, NEI

*Present via telephone

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

(8:30 a.m.)

CHAIRMAN SCHULTZ: Good morning. This meeting will now come to order. This is a meeting of the Advisory Committee on Reactor Safeguards Subcommittee on Fukushima. I am Steve Schultz, Chairman of the subcommittee. Members in attendance are Harold Ray, Dana Powers, John Stetkar, Dennis Bley, Mike Ryan, Ron Ballinger, Charlie Brown, and Mike Corradini.

We also have former ACRS Chairman, Dr. Bill Shack at this meeting as our consultant on this matter.

The purpose of today's meeting is to review three draft regulatory guides and the NEI technical reports that support the proposed rule for mitigation of beyond design basis events.

During our previous subcommittee and full committee meetings, we did not have the opportunity for detailed interaction with the staff or industry on these documents. So, we plan to do that today. As shown on the agenda, we will be discussing each regulatory guide separately.

Later today, we will shift gears and discuss with the staff and industry the final versions of the interim staff guidance on reliable hardened

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1 containment vents for BWR Mark I and Mark II designs
2 and the related NEI supporting document.

3 The full committee requested that the
4 staff provide these completed documents to this
5 subcommittee for our review at this meeting.

6 This meeting is open to the public. The
7 meeting is being conducted in accordance with the
8 provisions of the Federal Advisory Committee Act.
9 Rules for the conduct of and participation in the
10 meeting have been published in the *Federal Register* as
11 part of the notice for this meeting.

12 The subcommittee intends to gather
13 information to analyze relevant issues and facts and
14 formulate proposed positions and actions as
15 appropriate for deliberation by the full committee.

16 Ms. Kathy Weaver is the Designated Federal
17 Official for this meeting.

18 A transcript of the meeting is being kept
19 and will be made available as stated in the *Federal*
20 *Register* notice. Therefore, we request that
21 participants in the meeting use the microphones located
22 in the meeting room when addressing the subcommittee.
23 When recognized, first identify yourself and speak with
24 sufficient clarity and volume so that you may be readily
25 heard.

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1 We have received no written comments or
2 requests for time to make oral statements from members
3 of the public regarding today's meeting.

4 I do understand that there may be
5 individuals on the bridge line today, who are listening
6 on today's proceedings. To effectively coordinate
7 that participation in this meeting, we will be placing
8 the incoming bridge line on mute, so that those
9 individuals may listen in. At the appropriate time,
10 later in this meeting, we will provide the opportunity
11 for public comments from the bridge line and for members
12 of the public in the audience.

13 We also have another telephone line that
14 is set up for additional NEI staff to participate in
15 answering ACRS members' questions, if needed during the
16 meeting. If you are on this line, please keep your
17 phone on mute at all times, when not addressing the
18 committee. It is very sensitive here and all your
19 background noises will transmit over this line.

20 I also remind us all in the meeting room
21 to turn off our communication devices, so that there
22 are no interruptions during the meeting.

23 For the subcommittee members who were not
24 present yesterday, we have to inform you that there is
25 a new protocol for providing individual committee

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1 responses. These microphones are now set so that they
2 may be turned off when not in use. There is a button
3 on the bottom of your microphone. Please turn off that
4 microphone now after the green light is showing. And
5 when you want to ask a question or make a comment, turn
6 it on and speak your piece.

7 We will now proceed with the meeting and
8 I will call upon David Young of NEI to open the
9 presentations today and to introduce the first panel
10 for the discussion.

11 MR. YOUNG: Thank you, Dr. Schultz. Good
12 morning, everyone. My name is David Young and I am the
13 Senior Project Manager of the Emergency Preparedness
14 Department at NEI and with me are Walt Lee, Paul
15 Driehaus, Roy Linthicum, and Phil Amway.

16 We appreciate this opportunity to provide
17 an overview of NEI 14-01, 13-06, and 12-01 and answer
18 your questions concerning these guidance documents.

19 As you are aware, the NRC staff has
20 proposed to endorse all three guidance document sin
21 Draft Regulatory Guide DG-1319.

22 With us in the audience and on the phone
23 lines are some of the industry members who helped
24 develop this NEI guidance, several of whom are current
25 or former licensed operators.

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1 So, we will begin with NEI 14-01 and I am
2 going to turn it over to Phil Amway to get it started.

3 MR. AMWAY: Good morning. My name is Phil
4 Amway from Exelon Corporation. I will be walking us
5 through the NEI 14-01 discussion. As Dave had said,
6 there are members of the PWROG that are both on the phone
7 line, I believe we have Bill Williamson on, who is on
8 the Emergency Procedures Committee for the PWROG.
9 Also in the room with us, Randy Bunt, who is also a
10 member of the PWROG. I may ask them for assistance in
11 clarifications and answering questions that the ACRS
12 committee may have related to 14-01.

13 We will start off. 14-01 is the Guidance
14 Document for making sure that our various procedure
15 classifications are properly integrated, that they are
16 cohesive, they are effective, and they are usable for
17 the operators in responding to events.

18 The purpose of 14-01, it addresses the
19 recommendations for developing the command and control
20 structures that are necessary to ensure that we can
21 appropriately mitigate and manage beyond design basis
22 accidents, including severe accidents -- design basis
23 events, including severe accidents.

24 There are a number of topics in 14-01. We
25 are going to pay particular attention to the

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1 integration portion but it also does address the
2 requirements for the SAMGs and the command and control
3 structures for beyond design basis events. It is
4 important to note that the elements, the major
5 structural components of this procedure classification
6 and structure are already in place. We will go through
7 those various procedure classifications throughout
8 this presentation. But there are enhancements that
9 need to be implemented as part of NEI 1401 to make sure
10 that that integration is there and the appropriate
11 level of guidance is available to operators and the ERO
12 staff when responding to the beyond design basis events
13 that occur.

14 So, that is the overview of 14-01. The
15 integration certainly has been a topic of discussion
16 at past ACRS meetings and I have seen it not only in
17 the context of this combined rulemaking, beyond design
18 basis event rulemaking, but it has also come up as a
19 topic of discussion in some of the other subcommittee
20 meetings, such as hardened vents and FLEX and things
21 of that nature, just because of the very nature that
22 we are going to implement post-Fukushima actions using
23 procedures. So, that is a very important component of
24 post-Fukushima actions.

25 In developing the approach in 14-01, it has

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1 involved a number of groups of stakeholders, including
2 the BWROG and PWROG. And within those organizations,
3 it also includes licensed operators in the various
4 facilities in developing that guidance documents.

5 Licensees --

6 MEMBER STETKAR: Phil?

7 MR. AMWAY: Yes.

8 MEMBER STETKAR: When you say licensed
9 operators, people currently licensed operating plants?

10 MR. AMWAY: Both currently licensed and
11 former licensed. That is correct.

12 MEMBER STETKAR: Thank you.

13 MR. AMWAY: Yes. The licensees,
14 themselves, have been involved in various ways. We are
15 speaking here of licensees in general, which would
16 include engineering, training, that type of thing.

17 Also, NEI, in developing the actual
18 guidance documents, and EPRI, in the form of developing
19 underlying analysis in the evaluations that support
20 these products.

21 It reflects NRC requirements and guidance
22 and it considers the extensive operating experience
23 that already exists.

24 The structure that we have in place has
25 been used in actual past plant events. The framework

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1 itself that we have in place is sound. But we do
2 acknowledge and the reason why we are doing this
3 activity on integration is because there are
4 enhancements that can be made.

5 This slide here, I just bring this up here
6 because it is something we are all familiar with. This
7 comes out of both 14-01 and NEI 12-06. For the purpose
8 of discussion today, this is really showing the
9 hierarchy of the procedure structure that exists and
10 the addition of the various procedure classifications
11 that have been added post-Fukushima, primarily, the
12 FLEX Support Guidelines.

13 This note down at the bottom that says, in
14 addition, the BWROG has developed Technical Support
15 Guidelines in the support to SAMGs. That was true at
16 the time. There has been work within the PWROG. I
17 will ask Roy Linthicum to explain some of the work that
18 is ongoing within the PWROG to develop those TSGs, also
19 to support PWR SAMGs.

20 MR. LINTHICUM: This is Roy Linthicum from
21 the PWR Owners' Group. From our perspective, when we
22 started working on this integration effort, we actually
23 formed a joint committee from both the combined between
24 the BWROG and the PWROG. And one of the lessons we
25 learned in looking at their guidance was that they had

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1 some good guidance. These Technical Support
2 Guidelines that help enhance -- provide some of the
3 technical basis for the SAMGs. And we felt that that
4 was something that we were missing and could definitely
5 learn from.

6 So, as part of our effort to enhance our
7 SAMGs and to combine the three different NSSS-type SAMG
8 documents into one consolidated set, we also included
9 the development of these Technical Support Guidelines
10 for our utility members as well.

11 MEMBER CORRADINI: Can you give an example
12 of this?

13 MR. LINTHICUM: I will ask Mike Bonfiglio.
14 He was much more involved in that development. I think
15 he could provide a better example. There is a
16 microphone up here.

17 CHAIRMAN SCHULTZ: Right over here, Mike.
18 Thank you. And just introduce yourself before you
19 speak. Thank you.

20 MR. BONFIGLIO: Is this working?

21 CHAIRMAN SCHULTZ: Yes, it is.

22 MR. BONFIGLIO: Okay, so I am a very short
23 guy. I am Mike Bonfiglio. I work for AREVA. I
24 represent the Pressurized Water Reactor Owners' Group.
25 It is kind of important to note I am also an ex-SRO for

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1 both Westinghouse and Babcock and Wilcox designed
2 plants.

3 My department is involved in developing
4 what we are calling an enhanced Severe Accident
5 Management Guidelines that takes the three vendor-type
6 from PWRs, the three vendor-type Severe Accident
7 Management Guidelines and we basically pulled the best
8 practices out of all three and came up with an enhanced
9 document that now applies to all three pressurized
10 water reactor vendors. So, we are going to have a
11 common guideline document to provide the underlying
12 basis for the utilities to develop their plant-specific
13 Severe Accident Management Guidelines.

14 During the efforts where we were trying to
15 decide what is the best way to go about things, we were
16 meeting with Jay Liter and Bill Williamson and other
17 folks from the Boiling Water Reactor Owners' Group and
18 they said we have got this technical support guideline
19 that provides background information for the TSC staff
20 and for the Ultimate Decision Maker that is going to
21 be making the decisions associated with severe accident
22 progression and what is the best strategies to take and
23 the reason to take it.

24 So, we have taken their example and
25 integrated it into our enhanced product, which is

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1 actually out in draft form. And our first set of
2 validations is being performed at Byron Station this
3 week.

4 MEMBER CORRADINI: So, can you give me a
5 more specific example of what you found on the BWR side
6 that you have now incorporated --

7 MR. BONFIGLIO: Well, we didn't take the
8 actual guidance. We took the example of you having the
9 support document because --

10 MR. LINTHICUM: I think the question, Mike
11 is, an example of a TSG.

12 MR. BONFIGLIO: Yes, so we have TSGs that
13 contain essentially the calculational age that
14 provides the information to the TSC staff if the
15 instrumentation in the control is not operating
16 properly, for example.

17 So, you would assess plant conditions,
18 compare the instrument readings and it provides a
19 method of determining which indication is your most
20 valid and which path to follow relative to the strategy
21 that you need to implement to protect the containment
22 or slow the progression of the accident.

23 So, we have a TSG that assesses the
24 operability of instrumentation. We have a TSG that
25 actually supports methods of getting water into the

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1 containment and the decision process for when to do it
2 because sometimes it may not be the best thing to do.
3 So, it provides background information for that.

4 MEMBER CORRADINI: So, if I could say it
5 back to you so that I understand it. So, in the past,
6 this was vendor-specific or didn't exist at all in terms
7 of a specific procedure. And now with these, the
8 technical support center would essentially go through
9 -- one of the members of the TSC would go through some
10 sort of calculation to make sure if I had this agreement
11 and instrumentation consistency, which one would I tend
12 to want to believe more than another?

13 MR. BONFIGLIO: Correct. It provides an
14 assessment capability to determine, based upon
15 benchmarking other plant conditions, which of the
16 instrumentation or which path is the appropriate path
17 to follow.

18 MEMBER CORRADINI: And this is
19 independent of brown and yellow, orange, or red?

20 MR. BONFIGLIO: Well, the TSGs or the
21 Pressurized Water Reactor Owners' Group are applied to
22 the Severe Accident Management Guidelines, which would
23 be the top --

24 MEMBER CORRADINI: Oh, okay. So, in
25 theory, you won't have inconsistency before you get out

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1 of orange and into red.

2 MR. BONFIGLIO: I would not be using the
3 TSGs until I got into the Severe Accident Management
4 Guidelines.

5 MEMBER CORRADINI: Okay.

6 MR. BONFIGLIO: There are symptom-based,
7 not that it is determining plant conditions and making
8 decisions, outside of the TSGs that are part of the
9 current structure. We didn't want to disturb the
10 current structure because there is thousands of hours
11 in training related to that.

12 MEMBER CORRADINI: Sure.

13 MR. BONFIGLIO: So, we left the existing
14 structures for the three vendors in place and enhanced
15 the Severe Accident Guidelines to be applicable to all
16 three vendors.

17 MR. YOUNG: And in an upcoming slide, we
18 are going to highlight that transition point.

19 MEMBER CORRADINI: So, one last question,
20 just so I get it. So, the TSGs is mainly connecting
21 -- helping in the connection to the red box.

22 So, in all of these up to, I assume, the
23 red but not including it, you are using a simulator or
24 some calculational tool to develop an accident
25 signature that you would use as kind of like a tabletop

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1 what if to train.

2 MR. BONFIGLIO: Yes, that would be for
3 training purposes up through the Emergency Operating
4 Procedures, the full scale simulators that are at all
5 utilities are fully capable of providing the simulation
6 and --

7 MEMBER CORRADINI: Up through the
8 Emergency Operating Procedures.

9 MR. BONFIGLIO: Yes, up to the EOP. Once
10 you get to core melt progression, simulator modeling
11 tends to fall apart.

12 MEMBER CORRADINI: Okay.

13 MR. BONFIGLIO: It is also kind of
14 important to note that in the Pressurized Water Reactor
15 Owners' Group, the TSGs are only using the Severe
16 Accident Management Guideline documents because our
17 existing structures we thought was adequate; whereas,
18 in the BWR Owners' Group, it is part of their EOP.

19 So, they actually review the TSGs wherever
20 they felt it warranted.

21 MEMBER CORRADINI: Okay, thank you.

22 MR. AMWAY: Okay.

23 MEMBER BLEY: Just let me pursue that last
24 statement just a little. If things somehow demanded
25 it, I would assume, I would hope that they could still

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1 access those procedures, if it made sense.

2 MR. BONFIGLIO: Oh, absolutely, yes. If
3 the symptoms present themselves that you need to go to
4 the Severe Accident Guidelines, you would go there and
5 use all the tools that are available to you at the time.

6 MEMBER BLEY: Okay.

7 MR. BONFIGLIO: And what we considered the
8 TSGs are really a tool for the decision makers to
9 enhance their ability to make the decisions during a
10 very difficult situation.

11 MEMBER BLEY: Okay but even before other
12 decision makers have responded, if things had
13 deteriorated quickly, I am still thinking the operators
14 could take advantage of that.

15 MR. BONFIGLIO: Oh, absolutely. Yes,
16 absolutely they will use whatever tools are available
17 to them when the conditions present themselves that
18 would require it. Yes.

19 MEMBER BLEY: And they will be trained on
20 that aspect.

21 MR. BONFIGLIO: Absolutely, yes.

22 MEMBER BLEY: One other, just a curiosity
23 for me. At least one of the three vendors has EOPs that
24 are very, very different from the others.

25 MR. BONFIGLIO: That is correct.

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1 MEMBER BLEY: Whatever led to that doesn't
2 really affect this.

3 MR. BONFIGLIO: No.

4 MEMBER BLEY: Everybody thinks this is
5 going to work fine.

6 MR. BONFIGLIO: I represent the vendor
7 that is different. I own the Babcock and Wilcox tech
8 basis document. My department maintains it. There is
9 really not as much difference between the approach that
10 is taken by the Babcock and Wilcox fleet and was taken
11 by the Westinghouse and CE fleet, it is just that go
12 directly to the symptom-based guidelines out of the
13 trip procedure without having any interim procedures.
14 There is no E1, E2, E3 series of procedures for them
15 to run through. They just diagnose the same symptoms
16 based on the same events. So, the transitions --

17 MEMBER BLEY: And if things are weird, they
18 can patch things together, which is even closer to these
19 other procedures.

20 MR. BONFIGLIO: Yes, absolutely.

21 MEMBER BLEY: Okay.

22 CONSULTANT SHACK: Just out of curiosity,
23 what are you trying to indicate between the solid and
24 the dashed arrows?

25 MR. AMWAY: And you are referring to right

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1 here, the solid and dashed arrows. What that indicates
2 is that the FLEX Support Guidelines are really support
3 procedures could be to either EOPs, Emergency Operating
4 Procedures or Severe Accident Management Guidelines
5 where they are actually called out. Like within the
6 severe accidents, it may tell you to preserve this
7 function, go do this section of an FSG to make sure that
8 -- it actually gives you the step-by-step details of
9 how to restore that function or to maintain that
10 function.

11 EDMGs and FLEX, the dashed line there shows
12 that the EDMGs are built as a separate -- I mean it was
13 built in response to B5B 50.54(hh) (2) Loss of Large Area
14 Stations and it has both a -- and you will see it in
15 the next slide but a command and control structure
16 component to it. It also has specific methodologies
17 of how to go out and supply makeup to the RPV, how to
18 protect containment, things of that nature. Where, if
19 you are in the EDMGs, you have those methodology
20 procedures but you may also benefit by using a FLEX
21 Support Guideline.

22 Maybe the thought process behind the EDMG
23 methodology procedure won't work in a specific
24 application but the FLEX Support Guideline will. So,
25 there is that freedom to be able to use the FSGs to

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1 support the EDMGs.

2 CONSULTANT SHACK: Are people really
3 doing the EDMGs to take advantage of the fact that they
4 now have the FLEX equipment?

5 MR. AMWAY: They are certainly looking at
6 that, yes. And so there may be some adjustment there
7 to -- and I expect there will be some adjustment to the
8 original EDMG procedures that will now take the benefit
9 of the FLEX capability because it is better. I mean
10 it is pre-engineered it is ready connection points,
11 things of that nature.

12 MR. LINTHICUM: I think it is possibly one
13 of the enhancements that folks could identify when
14 going through the guidance in NEI 14-01. In doing that
15 integration assessment, this could be one of the
16 enhancements you would pick up.

17 MEMBER STETKAR: Is one of the
18 enhancements just getting rid of the EDMGs completely?
19 Why do you need yet another set of procedures to confuse
20 the operators?

21 MR. AMWAY: Well, I would answer that as
22 the EDMGs are specifically built for Loss of Large Area
23 Station due to fire or explosion.

24 MEMBER STETKAR: They are built for a
25 presumed stylized assumed set of regulatory compliance

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1 conditions that was negotiated with the staff but is
2 an artificial condition, at least operating plant. We
3 had to deal with a lot of artificial regulatory
4 conditions that we thought were absolutely absurd. I
5 use that term a lot.

6 Now, that we are taking a holistic,
7 flexible strategy toward dealing with things outside
8 of the procedures, why do we need to constrain ourselves
9 to these artificial rules?

10 MR. YOUNG: I think you have already
11 provided the answer. It is regulatory compliance.

12 MEMBER STETKAR: Why doesn't the industry
13 try to address this in a holistic sense rather than
14 saying oh, we are not going to attack that because that
15 is a regulatory compliance issue?

16 MR. YOUNG: But in the Guidance Document,
17 we have to write it towards the regulatory -- the
18 requirements in place. So, that is the way the
19 guidance document is written.

20 MEMBER STETKAR: I will ask the staff
21 about that.

22 MEMBER STETKAR: I would hate to be in a
23 control room sometime where I was in trouble because
24 somebody wrote confusing procedures for regulatory
25 compliance.

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1 MR. YOUNG: I think we are going to talk
2 about this in just a minute.

3 MEMBER STETKAR: Okay.

4 MR. YOUNG: I don't think it is confusing
5 as maybe --

6 MEMBER STETKAR: It sounds confusing and
7 it reads confusing. So, I hope that --

8 MR. YOUNG: We'll talk about it.

9 MR. LINTHICUM: But there is another
10 aspect of the EMGs, which actually I think goes to your
11 point, is it also addresses a loss of the control room
12 function.

13 It covers lots of command and control
14 because you don't have your control room anymore and
15 provides diagrams on how to do that.

16 MEMBER STETKAR: Okay but so do some of the
17 fire procedures. Control room abandonment under my
18 normal fire response procedures address that, too.

19 MR. LINTHICUM: Well, it doesn't address
20 the loss of command and control. It doesn't address
21 the fact that your operators may all be dead.

22 MEMBER STETKAR: It addresses control
23 room abandonment.

24 MR. LINTHICUM: But your control room
25 staff is still available.

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1 MEMBER STETKAR: Okay.

2 MR. LINTHICUM: So, we have a slide that
3 will go into that.

4 MEMBER STETKAR: Okay.

5 MR. AMWAY: If you liked this slide, you
6 will love the next one.

7 MEMBER STETKAR: I'm looking at the next
8 slide and I am trying to sort it out. So, I am hoping
9 you guys are.

10 MR. AMWAY: Before we leave this slide,
11 this slide really was here to show, I mean as it has
12 been to explain the context of integration in the past.
13 It really didn't -- I don't think it necessarily did
14 an adequate job to show that. And we are looking at
15 this more in term of the hierarchy until get to the next
16 slide.

17 But before I leave it, I just want to point
18 out that if you go for the green progression all the
19 way to the top, the general operating procedure are
20 there, your day-to-day startup, shut down, normal
21 operation of the system.

22 Your response procedures, something
23 abnormal happens, brings in an alarm, the operator's
24 response would be per the ARP. The APR is generally
25 going to tell the operator go do a certain section of

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1 your general operating procedure to address that event.
2 Or it may have specific steps within the alarm response
3 procedure for addressing that condition.

4 The next level going up is you have a
5 broader event, most likely you are going to have
6 multiple alarms come in because that is going to address
7 things like it could be fire or flooding. It could be
8 loss of feedwater flow, a sudden reduction of core flow,
9 event type activities that happened that may also
10 incorporate specific alarm response procedures and the
11 general operating procedures in order to combat that
12 situation.

13 Then the next step being the emergency
14 operating procedures and that hierarchy exists and
15 provides the command and control structure above
16 everything else below and then, ultimately, the SAMG.
17 So, that is really what we wanted to point out on this
18 slide is to point out that hierarchy that exists and
19 how that supports the integration.

20 And this is a new slide here that we
21 developed to help explain the integrations piece. And
22 so I want to really spend some time going through this
23 chart to make sure we understand across the top you will
24 see the strategy command and control aspects. We have
25 the AOPs, EOPs, SAMGs, EDMGs across the top.

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1 We list both AOPs and just some high-level
2 things about this chart, you will see that there is AOPs
3 listed in the vertical column and AOPs listed also in
4 the horizontal. The rationale for that is because the
5 AOPs could be a stand-alone response to an event that
6 hasn't degraded to the point that you need to enter the
7 EOP for the SAMGs. You can control the plant within
8 the AOP. But within that AOP, it is going to have
9 supporting sections within it that address the specific
10 implementation methods for how to combat a loss of
11 feedwater flow or a sudden reduction in core flow,
12 those type of things. So, it is all built into that
13 one procedure. You follow it. It may have kick outs
14 to lower tier procedures, such as your normal operating
15 procedures. Let's say you go to this section in your
16 operating procedure and reset the full controls coming
17 back or something of that nature. And so that is how
18 the AOP structure works.

19 The APOs also address things like the fire
20 and the flooding and, as was mentioned, the control room
21 abandonment procedure. That is an AOP.

22 MEMBER STETKAR: So these are really not
23 the hierarchy that you showed on the previous slide
24 because we have events where the operators -- fire
25 events, real fire events where the operators are using

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1 the fire response procedures, which are characterized
2 in here as an AOP and the EOPs, in parallel, not as a
3 hierarchical structure.

4 MR. AMWAY: But your EOP is still going to
5 have a hierarchy over the AOP actions. Because your
6 EOPs are going to address the things like control core
7 cooling, control containment integrity, control the
8 spent fuel pool.

9 MEMBER STETKAR: And we have events from
10 real fires with people, because they have been using
11 these procedures in parallel have been overloaded and
12 have taken the responses that indeed did not follow all
13 of the EOP guidance because they were overloaded
14 because they were using two sets of procedures in
15 parallel. And they were focusing on what they
16 determined at the time was the more severe threat which
17 either was a real fire or, in some cases, only a
18 perceived fire but they didn't know whether they had
19 a fire or not.

20 But the fact that they were confused is
21 they were not operating in this hierarchical structure
22 that you showed on the previous slide. They, indeed,
23 were operating in two sets of procedure in parallel and
24 trying to decide which set of guidance they should use
25 to address what they perceived at the time as the most

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1 difficult problem to the plant.

2 So, it is not that hierarchical structure
3 that you showed in the real world. And I would ask you
4 why you keep presenting it that way because we know,
5 we have actual operating experience from real fires and
6 things that looked, to the operators, like a fire, where
7 they indeed were using sets of procedures in parallel.
8 If you do the post-event interview with the operators,
9 yes, the shift technical advisor was using his own
10 things and because they didn't have the right
11 indications, he wasn't even in the control room part
12 of the time.

13 MEMBER BLEY: And it doesn't really help
14 to say I wouldn't have done it that way or maybe they
15 shouldn't have done it that way. It made sense to them
16 at the time to do what they were doing.

17 MEMBER STETKAR: And they were focusing on
18 what they honestly believed was the worst problem in
19 the plant and taking appropriate actions for that
20 particular condition.

21 MR. YOUNG: Is there a particular example
22 you have of that that you have got in mind?

23 MEMBER STETKAR: Yes, the H.B. Robinson
24 fire event, loss of offsite power at I think it was
25 Millstone.

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1 MR. YOUNG: We did a pretty detailed
2 review over the last couple of days and I am telling
3 you, we are not seeing integration of fire response
4 procedures as being any kind of precipitating cause in
5 that event. It wasn't listed in the AIT report. It
6 wasn't listed in any of the NRR reports.

7 I mean I am just giving you the facts.
8 That is what it says.

9 MEMBER BLEY: We won't have a debate. We
10 can have a debate but the AIT report I read certainly
11 pointed out the situation that was set up because of
12 that.

13 MR. YOUNG: We just looked at it yesterday
14 but all right.

15 MR. AMWAY: I understand the point that if
16 there is confusion between whether I follow an AOP or
17 an EOP is going to lead to problems. But I will tell
18 you that the entire training program of licensed
19 operators over a 22-month period does exactly that in
20 terms of teaching the operators how to execute AOPs in
21 parallel with EOPs.

22 EOPs are purely symptom-based type of
23 procedures. You have a trip. You have a low reactor
24 water level, specific defined entry conditions, you are
25 in the EOP.

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1 The AOPs are more of an event-based type
2 of procedure where you get a sudden reduction of core
3 flow, a fire, a flood, a particular event that drives
4 you to enter that AOP. There is going to be a
5 cross-over because in responding to the event, you may
6 have a reactor trip or you may have some other EOP entry
7 condition that is going to drive you to enter the EOP.

8 MEMBER CORRADINI: So this is not an area
9 that I understand very much at all. But what John is
10 asking is true that I could get into some of that which
11 then the operator is going to have two sets of books
12 in front of him and say that I have to deal with the
13 event here but the way you are describing it, the EOPs,
14 which are more symptom-based about controlling
15 function in these three areas, containment, core, and
16 spent fuel would come in then?

17 I am still trying to understand. Let me
18 ask my question differently.

19 So, is it true that I would be in a
20 situation where I would have two sets of books in front
21 of me?

22 MR. PAPPAS: I would like to -- Phil, if
23 you don't mind, can I try that?

24 MR. AMWAY: Yes.

25 MR. PAPPAS: My name is Nick Pappas. I am

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1 a loaned employee at the NEI. I am a shift manager at
2 Palo Verde.

3 And to address a situation as you bring up,
4 assuming we have a fire, we have a set of fire
5 strategies, fire procedures. If I compound that with
6 a reactor trip, let's say caused by the fire or just
7 happened to have concurrent with it, the control room
8 supervisor will assign one of the board operators to
9 implement the fire strategies which will give
10 direction, say in this zone you may lose this equipment;
11 you may have these spurious actions. That is written
12 from the worst case everything goes bad.

13 He is going to run his Emergency Operating
14 Procedure through his safety function checks and
15 standard post-trip actions with a designated operator.

16 Before assigning an individual to that
17 fire protection procedure, fire strategy procedure, he
18 is going to be communicating with the control room
19 supervisor. And he may say close Valve X or you may
20 lose control of Valve X; do you want me to shut this
21 equipment down or start this equipment up.

22 It is not an independent satellite
23 operation going on. There is a central point of
24 control that goes on with that and concurrently,
25 certainly, there is potential EAL levels, et cetera and

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1 these all, there is no real way, as a user, I would want
2 to have a procedure that says operate Valve X and, oh
3 by the way, if you have a fire consider these things.
4 I couldn't lift the procedure to use it.

5 I believe that, and no offense to my
6 brothers at Robinson, if I really look at that as a user,
7 there were some very bad decisions made, contrary to
8 some expectations and some procedures they had in
9 place.

10 Now, I don't know how you can stop that but
11 I don't believe that procedure integration with the
12 fire procedures would enhance that. Right now, I
13 believe, the training we get to say you have a fire in
14 this area and you have a concurrent event really
15 prepares people pretty well for how to dole out and
16 prioritize the actions needed.

17 I will leave it there.

18 MEMBER CORRADINI: Okay.

19 MEMBER BLEY: You know I would agree with
20 everything that was just said if you had said we expect
21 them to do this and that. Saying this is what they will
22 do is contrary to at least four or five historical
23 events. And the easiest thing in the world is to say
24 those guys were dumb and we are smart but it happens.
25 And if you are not looking at that record and thinking

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1 about it as you build these, I think that is a gap.

2 MR. AMWAY: And I agree. I mean we are not
3 here trying to say those guys were dumb and we have
4 nothing to learn because all of us, through that
5 Robinson event, have gone back and made changes to
6 procedures and training programs to address those gaps
7 to make sure that -- and as Nick suggested or said, and
8 that is exactly right, we do the same thing on the BWR
9 side, we will assign an operator to an EOP procedure
10 while the control room supervisor maintains the
11 command and control through the EOP. But it is not that
12 they are separated, where the CRS is marching down his
13 procedure, the board operator is marching down his and
14 they are not talking to each other. They need to be
15 aware of what each other's actions are doing in parallel
16 to the board operator knowing that his actions could
17 impact the EOP performance and the CRS recognizing that
18 the set of actions that he has in his EOPs, some may
19 or may not be available because of the AOP condition.

20 You know fire is one specific example of
21 that. If it impacts the safe shutdown area for
22 Division 1 and he is going and executing his EOP actions
23 for RPV makeup, you know he is probably not going to
24 be relying on Division 1 systems for RPV makeup. He
25 would want to go to Division 2 and prioritize that in

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1 his list, even though the EOPs say here is all your list
2 of available systems. He has to be knowledgeable to
3 plant conditions at the time to know which ones he
4 should be implementing to execute the strategies
5 outlined in the EOPs.

6 MEMBER CORRADINI: So again, asking from
7 kind of a position of not understanding details. So,
8 the lessons learned from what the events that John and
9 Dennis are discussing, have there been changes in the
10 interplay between the AOPs and the EOPs because of
11 those?

12 MR. AMWAY: I would say in some respects,
13 yes. I mean because I have also written procedures in
14 my past and you always want to be, when you are
15 developing a procedure, not just focusing on what that
16 procedure does but also its interaction with other
17 procedures, whether they be AOPs to make sure that it
18 has the necessary links within it to know that there
19 could be impacts with performance of other procedures.
20 You don't want to have a procedure that says do this
21 set of actions that is totally contrary to any of the
22 other procedures classifications.

23 So, it is not one particular action fixes
24 everything. It is a combination of how you are going
25 to train those operators on the procedure, how you write

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1 them.

2 MEMBER CORRADINI: I understand that but
3 I guess I am asking kind of specifically given these
4 sorts of historical events, has the way in which the
5 AOPs and the EOPs interwoven changed because of what
6 was learned from those events?

7 I mean I don't know enough to ask anything
8 more specific. So, that is why I am kind of curious.

9 MR. BONFIGLIO: This is Mike Bonfiglio
10 again from AREVA. I think the answer to your question
11 is not specifically. In other words, we didn't make
12 mass changes to the structure of the AOPs and EOPs and
13 the way things are interfaced.

14 What we did look for was gaps in guidance.
15 For example, the Robinson event, one of the things that
16 led to the significant over-cooling was a gap in the
17 guidance for isolating the secondary plant when you
18 didn't have power to the valves in that.

19 There was a step that said look at this but
20 the guidance for how to deal with that valve not having
21 power wasn't there. So, the operators just moved on.
22 They let them go. They ignored the over-cooling event
23 that was going on. It was the underlying problem in
24 that event.

25 So, we are looking for the gaps in

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1 guidance.

2 MEMBER STETKAR: I'm sorry. They had an
3 overcooling going on but they also had no component
4 cooling water going to their reactor coolant pumps,
5 which is also of general concern.

6 My whole point is that as long as you keep
7 focusing on specific events and specific conditions --
8 oh, well, we fixed the procedure and told them to oh,
9 check overcooling. That is a very microscopic
10 approach to life. And we retrained those operators at
11 that plant to look at overcooling. That is a very
12 reactionary, microscopic event-driven approach to
13 life, rather than stepping back and saying is there a
14 better way that we can give guidance to the operators,
15 rather than focusing then on the minutia of things that
16 we have discovered by actual events and fixing that
17 particular condition. That is why I focused on the
18 details.

19 And I don't see that. I hear responses of
20 people saying well, we fixed up that procedure because
21 yes, they had this overcooling event and we are going
22 to fix up their procedure to make sure that if they do
23 not have power to those valves, then they should do
24 something else because we have discovered that for a
25 particular event.

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1 MR. YOUNG: I think we will have some
2 additional discussion. We have a slide coming up
3 specifically on the fire response procedures.

4 MEMBER STETKAR: Let me ask you one thing
5 in this sense because we are going to get limited on
6 time here. What bothers me about all -- you have heard
7 my ranting about this.

8 But if I now look back at 14-01, in Section
9 2.5, you say FSGs provide strategies for mitigating the
10 effects of an extended loss of AC power, ELAP,
11 consistent with NRC staff-endorsed guidance, the
12 development of FSG strategies assumed that there were
13 no independent, concurrent events, including the
14 postulated fire.

15 Okay. And then later you say, for
16 example, the emergency response organization positions
17 holding Ultimate Decision Maker authority could have
18 guidance for selecting the appropriate strategy and
19 then determining the priorities and actions necessary
20 for implementation.

21 So now, if I am an operator in a plant and
22 I have a fire and I have EOPs, and I have FSGs, and I
23 have fire response procedures and I don't have that
24 emergency response organization because I am in the
25 control room, now what do I do? Because I now have

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1 another set of guidance that I have to figure out what
2 I should use because that guidance specifically doesn't
3 apply for fire conditions.

4 MR. YOUNG: Well, I think what we are
5 saying there is to make sure that you have the right
6 rules of usage so you can look at the event at the time,
7 what is going on, and make the proper decision because
8 there is no balance on the permutation, the
9 combinations you could get of the event, the
10 consequences, the fire.

11 MEMBER STETKAR: There isn't, if you think
12 of it in very event-specific conditions, such as an ELAP
13 can only occur from a beyond design basis external event
14 --

15 MR. YOUNG: But that's not the way they are
16 written.

17 MEMBER STETKAR: -- that results in loss
18 of all AC power and access to the ultimate heat sink.
19 That is a very, very stylized condition, such as the
20 EBMGs are very stylized conditions. Such as many of
21 the fire response procedures, if you have a Train A
22 condition, is a very stylized response.

23 MEMBER BLEY: I think we are going to go
24 on and on. I mean they are lining up over here. We
25 have said this in letters and I don't think we ought

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1 to keep going on this.

2 MEMBER STETKAR: No.

3 MR. YOUNG: I'm hoping maybe if we get to
4 the next couple of slides, we get into the specific
5 guideline sets, maybe some of that will shed a little
6 more light on some of the things you are asking.

7 MR. BONFIGLIO: I think it is kind of
8 important to note, though that just because the
9 Guidance Document said the FSGs are only applied in a
10 given set of conditions doesn't mean that that is the
11 way they were actually integrated into the procedures.

12 MEMBER STETKAR: That would be great. I
13 think you have to appreciate --

14 MR. BONFIGLIO: So, for example in the
15 EOP, when I recognize a challenge to a function and the
16 FSG is the best way to restore that function, the EOP
17 directs the use of the FSG. If that is all you have
18 available to restore that function, it will direct you
19 to use it.

20 MEMBER BLEY: We haven't seen it all. But
21 when you see a statement like that, I have seen cases
22 where somebody would say oh, we can't do that because
23 it says this here.

24 And in the rush, you might not -- once in
25 a while everybody says oh, you are right and they go

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1 ahead. I think we need to get rid of the potential
2 confusion.

3 MEMBER STETKAR: I think you have to
4 appreciate a little bit of our perspective because,
5 quite honestly, this is the first opportunity we have
6 had to look at the actual implementation guidance.

7 We have seen very early drafts. We have
8 seen the picture a few times. But until you actually
9 look at the implementation guidance and think about the
10 words and, as Dennis said, how those might be
11 interpreted in practice, you start to raise some of
12 these questions.

13 Now, indeed, it may be true, if we had the
14 opportunity to look at the actual FLEX Support
15 Guidelines SAMGs, and have a better sense of how they
16 are integrated, some of these concerns might be
17 alleviated. And we haven't had that opportunity,
18 certainly. The only thing we have seen is the
19 implementation guidance.

20 MR. PAPPAS: I just want to follow-up on
21 one statement. You are very right when you say we have
22 addressed the overcooling event as one very microscopic
23 change. However, industry-wide, following these
24 events, people went back and ensured we had kick outs
25 as a prior to restoring a bus, ensure it is cleared from

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1 faults, et cetera. That sort of thing went
2 industry-wide, as well as training. So, it wasn't they
3 did it wrong and we wouldn't do it again. There were
4 changes, not just in that facilities case but there were
5 industry-wide changes. We took the lessons learned
6 and ensured our procedures were adequate to cover that
7 in the future. That is all I have.

8 CHAIRMAN SCHULTZ: Thanks for the
9 comment. So, back to you, Phil.

10 MR. AMWAY: Okay. I am going to maybe
11 move to the next slide. Here we go.

12 All right, FLEX Support Guidelines. They
13 are implemented under the control of the respective EOP
14 or AOP. That depends on the plant mode or condition.
15 This is where we get into the system-based aspects and,
16 hopefully, to address the concern that we understand
17 that FSGs were developed in response to a very stylized
18 sequence of events and how you get there. But the
19 actual implementation of those FSGs, they are written
20 to address those things but certainly does not restrain
21 them from being used in conditions that maybe similar
22 but not exactly to the stylized scenarios for the ELAP
23 loss of ultimate heat sink but would still be useful
24 in maintaining the particular strategy within the AOP
25 or the EOP to address the plant event or condition that

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1 exists at the time.

2 MR. YOUNG: And so, Phil, just to beat your
3 point home, if you were looking at an EOP, you are not
4 going to see an entry step that says have you had a
5 beyond design basis external event.

6 MR. AMWAY: That's correct.

7 MR. YOUNG: That's not --

8 MR. AMWAY: It is going to say maintain RPV
9 water level between top of active fuel and some value.
10 Use systems in detail E1. And it is going to list in
11 a priority try to use your installed systems. If they
12 are not available -- and it is just a bulletized list.

13 So, the operator is going to go and he is
14 going to circle, feed, and condensate. Oh, I don't
15 have power to that; not available. What's next?

16 ECCS systems, no power; not available.
17 FLEX Support Guideline. Oh, okay, that is portable
18 pumps. It is time to start deploying those FLEX pumps.

19 So, it is not predicated on the fact that
20 did he get in there because of an ELAP, is the ultimate
21 heat sink available. Those are things that he is going
22 to have to evaluate and assess to determine what is the
23 best water source to use in that application but it is
24 not that he has to filter into a very defined condition
25 in order to be able to use that equipment. If it makes

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1 sense for him to use it for that particular event, he
2 is free to use it.

3 It can also be employed through the SAGs
4 or SAMGs. You know we have the same -- the plant is
5 designed the way it is designed. You have the
6 equipment you have. And it is there to use, for the
7 operator to use, if needed, to respond to the event and
8 respond through the SAMGs as well.

9 It could be used in other cases as
10 defense-in-depth or certainly understanding that the
11 FLEX equipment is there to support other conditions.
12 It could be through the EDMGs, where your EDMG strategy
13 or mitigation method doesn't work but your FLEX does.
14 And as a procedure writer, you are going to look at,
15 when you are developing the FSGs, you are going to look
16 at the FSG and the EDMG and there might be a
17 consolidation effort there that is worthwhile that
18 serves both functions. It doesn't necessarily have to
19 mean that that is a totally separate pump, a totally
20 separate connection point. It may serve both
21 functions.

22 And it is a natural progression, as a
23 procedure writer, to try to do that, to minimize the
24 number of procedures an operator would have to use and
25 go to in responding to a particular event.

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1 So, I think you are going to find out that
2 the actual implementation of how we implement 14-01 is
3 going to be toward making sure that the procedures are
4 streamlined and able to be used and to allow whoever
5 is making the decision to use those procedures has the
6 guidance they need to determine what is applicable.

7 MEMBER BLEY: Phil, I have a question. I
8 kind of am in the same place John is, since we haven't
9 seen anything and you guys know more about what is
10 there. But as you begin to exercise these and try them
11 out and see how they work, I hope as you put together
12 scenarios for the operator you think really broadly and
13 don't bring them the ones exactly for which this was
14 made to fit right and you come up with something that
15 you hadn't been thinking about when you wrote them and
16 try it against some unusual things and things with
17 multiple things going on, the way INPO is pushing people
18 to do things now.

19 MR. AMWAY: Right.

20 MEMBER BLEY: To see how they work when
21 isn't exactly what you designed them to do is coming
22 at people.

23 MR. YOUNG: Yes, I agree. That is the
24 appropriate to how we would want to do the training
25 drills and exercise to make sure that they are

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1 challenged in their decisionmaking and can flow through
2 it and select the right path.

3 MEMBER CORRADINI: So, I will ask a
4 question here that maybe is not the right place to
5 answer it and you pick where you want to answer it. You
6 don't have to go back. So if I go back to the cartoon
7 in the red box, so as I move up the chain in my mind
8 the uncertainty of the accident signature gets wider
9 and wider, as I move up the chain. And when I get to
10 the red box, the accident signature could be
11 wide-ranging.

12 So the question is, do the Severe Accident
13 Management Guidelines, which are the way you have it
14 cartooned in, essentially sends us various places,
15 whether support guidelines or FLEX guidelines, et
16 cetera, et cetera, are they sufficient robust or how
17 they are exercised so that if I have a wide range of
18 accident signatures I still get a response that is not
19 contradictory or I might want to go in one direction
20 with a certain accident signature and a totally
21 different direction with another accident signature?
22 Has that been tested out?

23 And you can wait, you don't have to do it
24 now, but I am curious how you think that through.
25 Because it seems to me there could come a time that I

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1 do a calculation, I assume these are all calculations,
2 that the calculation sends me in this direction but the
3 uncertainty is such that it might send me in a totally
4 different direction of action.

5 MR. AMWAY: And I think you are raising a
6 very good point and I think that they do exactly what
7 you say. As the uncertainty increases, as you go up
8 that ladder, if you will, and that is why the EOPs and
9 the SAMGs are symptom-based so that if I do have a
10 containment high temperature condition or
11 over-pressure condition, it will prioritize for you how
12 to address that, based on what the SAMG assumes is
13 progressing at the time.

14 It asks you a series of questions across
15 the top related to RPV control of how long or to what
16 degree have I lost adequate core cooling. Have I been
17 able to maintain it? Have I been able to maintain it
18 above top of active fuel, above bottom of active fuel?
19 Have I been able to maintain it above core debris
20 retention values? Do I have none at all? Do I expect
21 the PRV to be breached?

22 And you constantly assess those conditions
23 while you are in that SAMG and the strategies that are
24 associated with each of those questions and answers
25 support that particular aspect. You know if I expect

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1 to be able to retain fission products within the reactor
2 vessel, my sequence of actions is different than if I
3 think that the RPV has been breached.

4 In terms of where I am going to control
5 containment pressure, am I going to control it at
6 pressure suppression pressure or am I going to control
7 that primary containment pressure lift?

8 MEMBER CORRADINI: So, I will ask my
9 question again a different way and then we can stop.

10 So the two things that pop in my head that
11 are things that could create large uncertainty in how
12 I respond would be hydrogen generation amount and where
13 I put the water. So, I might decide to put the water
14 here, where I should have put it there because the
15 accident signature I calculate tells me I should put
16 it there but the uncertainty is I could have or should
17 have put it somewhere else. I might turn off sprays
18 when I want to turn on sprays. This sort of stuff is
19 what is kind of going through my mind.

20 Somewhere in today I am looking for some
21 warm and fuzzy feeling that all of this has been somehow
22 considered.

23 MR. LINTHICUM: Yes. So, in development
24 of our enhanced SAMGs, one of the key aspects that we
25 have is before you take an action you need to determine

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1 what you expect the response of the plant to be,
2 validate that you are actually getting that response,
3 and if you are getting a different response, then it
4 recognizes that the accident isn't progressing as you
5 thought, or you are not getting water where you think
6 you are getting it, or the core is not where you think
7 you are and you need to reassess where you are at.

8 MR. AMWAY: Well, we haven't addressed the
9 training aspect of that but we do recognize it is
10 something we need to consider as well.

11 MEMBER CORRADINI: Okay.

12 MEMBER BALLINGER: You have used the word
13 select the right path just a minute ago. Is there a
14 way in these procedures that allows the operator to
15 select the right path, even if it is not part of any
16 of these SAMGs? In other words, can the operator make
17 a decision to go in a certain way that happens to be
18 the right decision but it violates one or more of these
19 guidelines? In other words, can he use his or her
20 intuition and make a decision to go down a path, which
21 turns out to be the right path but happens to be not
22 one of these stylized sort of routes that you have in
23 the procedures?

24 MR. LINTHICUM: From our perspective, we
25 don't have stylized scenarios in our SAMGs.

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1 MEMBER BALLINGER: Yes, maybe I used the
2 wrong word.

3 MR. LINTHICUM: It is all function-based.

4 MEMBER BALLINGER: Okay, function-based.
5 All right, I used the wrong word. Nonetheless.

6 MR. LINTHICUM: Right, so we have our
7 evaluators and decision makers in the SAMGs as you
8 progress into the accident. That is exactly what they
9 are looking at is they are trying to decide what the
10 best course of action is. And the guideline is a
11 guideline. It is not a procedure.

12 MEMBER BALLINGER: Okay.

13 MR. AMWAY: Your division between
14 procedures and step-by-step performance versus a
15 guideline, or here is what you consider but if there
16 is an alternate strategy that is applicable, by all
17 means use it, is between that EOP, SAMG threshold.

18 MEMBER BALLINGER: Okay.

19 MR. AMWAY: Okay because the EOPs, while
20 you are in the EOPs, you have adequate core cooling.
21 So, your cooling geometry is intact and it is much more
22 easily defined.

23 As Mike brought up, as you go up that
24 ladder, the uncertainties broaden, all the EOPs are
25 still pretty focused in terms of as long as I have had

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adequate core cooling, I can assure that the plant containment and integrity is going to be maintained. It is when you exit out of there, and particularly when you get into the SAMGs, that is why you exit all of the EOPs. And then you enter the SAMGs because your strategies change and your underlying assumptions change in terms of what the condition of the plant is at that time.

Okay, this next slide deals with the SAMGs. And again, they are symptom-based. And as I stated, before you enter the SAMGs, you do exit all the EOPs, you enter the SAMGs. The condition that you do that is an indication of inadequate core cooling. And the way that this determined, there is a specific definition for core damage that you are looking for or it is the sustained inadequate core cooling, means you are not able to maintain the water level at a point in the reactor vessel that would make sure that the core cooling is assured. Once that decision is made and it is very clear within the BWR space, and I would assume it is or will be in the PWR space, when it is very clear, you get down to the bottom of your EOP, it says if you are unable to restore and maintain adequate core cooling, exit all EOPs, enter SAMGs.

And the basic function of the SAMGs is to

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1 arrest the progression of fuel damage because by that
2 time, if you have had the sustained loss of core
3 cooling, it is safe to assume that you have had some
4 level of core damage at that point. So your SAMGs, you
5 are going to take actions to stop that progression. It
6 is going to try to maintain your containment function
7 as long as possible and minimize any offsite releases
8 that you have.

9 The SAMGs still may direct specific AOP
10 actions, FLEX Support Guidelines, EDMGs as applicable
11 as a means of implementing various strategies within
12 the SAMGs.

13 MEMBER POWERS: When you speak to
14 arresting core damage, what is the technical basis that
15 you use for deciding that you can, in fact, arrest core
16 damage?

17 MR. AMWAY: I would say the biggest
18 parameter is how much flow can you get to the reactor
19 vessel. Okay, so when I exit the EOPs, I already know
20 I haven't maintained adequate core cooling. So, it is
21 somewhere between maybe I have minor clad perforation
22 all the way to I have got ex-vessel core debris. And
23 that is how the SAMGs are structured so when you first
24 make the entry, the first question you ask is do we
25 expect that the reactor pressure vessel is breached?

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1 Well, if I have just entered, I have just
2 left the EOPs and entered the SAMGs, there hasn't been
3 enough time for that accident to progress.

4 And then the next series of questions is
5 a sequence set, where the next question is can I restore
6 or maintain water level above top of active fuel.
7 Well, to do that, your reestablished core submerges,
8 you are going to stop the accident progression at that
9 time.

10 MEMBER POWERS: Can I ask you a question?
11 I am asking you what is the basis by which you say I
12 can stop the accident progression at that time.

13 MR. AMWAY: That is what the minimum
14 debris -- the MDRIR is what we call it, minimum debris
15 retention injection rate is based on being able to
16 provide enough flow to stop the accident progression.
17 And if there is anybody here that wants to amplify that
18 but that is the typical value we use. And if we can
19 maintain above that rate, we should be able to stop the
20 progression.

21 MEMBER POWERS: How do you come up with
22 that rate? I am making --

23 MR. AMWAY: It is an underlying
24 calculation for the plant.

25 MEMBER POWERS: What I am thinking of is

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1 I certainly submerged debris at TMI and didn't arrest
2 the accident. I am certainly seeing core tests in
3 which we flood a fuel at some level to damage and can
4 sometimes quench it, sometimes not so much. And I am
5 just asking what of this experiential base that we have,
6 how do you conclude that in a general situation like
7 this, in fact, will arrest the damage? I mean how do
8 you decide on the flow rates and things like that?

9 MR. AMWAY: Well, the flow rate --

10 MEMBER POWERS: Well it may be a simple
11 question. You may say I took a value that balanced heat
12 generation rate and water boiling rates or something
13 like that. I am not being critical. I am just asking
14 the question.

15 MR. AMWAY: Right.

16 MEMBER POWERS: I used the MAAP code or
17 something like that.

18 MR. AMWAY: I mean it is a calculation that
19 looks at time since shutdown, the KA curves and input.
20 How much more it takes, I don't particularly know but
21 the thought is if you can maintain above that rate, you
22 should be able to stop it. But it doesn't necessarily
23 mean you stop evaluating continued degradation within
24 the SAMGs. And that is the backstop, if you will, that
25 even though I established that minimum flow rate, I am

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1 still taking actions with in the SAMGs to improve the
2 condition of the plant and recover water level and
3 control the containment, such that if it doesn't and
4 my conditions continue to degrade, I am continuing to
5 evaluate that within the SAMGs, I preform other
6 actions.

7 MEMBER POWERS: I have always been curious
8 how I would react, were I operating a plant and I
9 increased the water flow in on a damaged core, and I
10 promptly saw all of my radiation indicators just scream
11 out. I mean they would just peg out. And the hydrogen
12 detectors would just go crazy at this point. And I
13 think my natural conclusion would be, gosh, I have just
14 made a mess out of what was a bad situation already.
15 Wouldn't I? That would be my guess.

16 MEMBER CORRADINI: Assuming you believe
17 the instrumentation.

18 MEMBER POWERS: What I am driving at is
19 your statement I am trying to improve the condition of
20 a plant. And that may be a very hard thing for somebody
21 to know that he is actually improving the condition of
22 the plant when he is taking an ad hoc action like this.
23 I mean, he is following the procedure and every
24 indication he has got from just sound for one thing,
25 from radiation monitors, hydrogen detectors, has just

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1 gotten worse.

2 Do you think operators are prepared for
3 that?

4 MR. LINTHICUM: Well I think it is part of
5 the training we give on to the SAMG evaluators. First
6 before you took that action to restore flow, you would
7 assess what you think is going to happen. Once again,
8 if it is unexpected, you would have to go back and figure
9 out why.

10 Again, someone could have a big pressure
11 spike in your RCS. When you added water, you increased
12 the reserve water reaction. That is what is driving
13 things. Maybe you breached the RCS at that point.

14 And then you would have to adjust your
15 actions now to address the containment response. And
16 then you have to go back and validate your
17 instrumentation.

18 MR. YOUNG: And in those guidance
19 sections, you will have pros and cons that are listed
20 there for consideration by the evaluators.

21 MEMBER CORRADINI: But let me ask this
22 question more pointedly. I thought you were going to
23 answer his question in a different way but you didn't.
24 So, I am just going to ask it.

25 So, I assume that you at least tuned this

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1 to TMI, which is for BWR Owners' Group, if I add the
2 water, if I lose cooling and I go through the thing,
3 I exit the EOPs and I go into SAMGs and I am there. And
4 you said all these box questions. The first box
5 question is can I restore core cooling. I assume there
6 is some sort of counter that says at 10 minutes, yes;
7 at 20 minutes, yes; at 30 minutes, eh; at 50, you are
8 screwed. Retreat, worry about the containment.

9 And I am curious that you actually kind of
10 tuned this to TMI. Was it tuned to something that
11 occurred? That is what I thought you were going to
12 answer Dana.

13 MR. LEE: If I could, this is Walt Lee with
14 Tennessee Valley Authority.

15 Again, I think the basis that you may be
16 looking for is the Technical Basis Reports that EPRI
17 provided, their extensive reviews of actions and
18 occurrences from our actual events that have occurred
19 in the industry and formed the basis for the SAMGs, the
20 technical basis now, working with vendors to ensure
21 that the specifics of a particular design are addressed
22 in taking the information from the TBR and applying that
23 to the SAMG calculational aids, provide us with the
24 information that we need to determine what the flow rate
25 would be necessary to arrest core damage.

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1 MEMBER POWERS: I guess what I am asking
2 you is do you, in these procedures -- say you have
3 concluded that you have got a damaged core and you are
4 going to add water at this point and expect a really
5 violent situation here and don't stop adding water at
6 this point.

7 I mean just because things got really bad,
8 if you have seen --

9 MR. AMWAY: So, your concern really is
10 when operators turn water back off, if they saw a spike
11 in radiation, a spike in containment pressure and
12 temperatures, and things of that nature.

13 MEMBER POWERS: And it would be
14 unbelievably noisy.

15 MR. YOUNG: Yes, I agree.

16 MEMBER POWERS: It is not going to sound
17 good. It is not going to look good. But it is still
18 the right thing to do.

19 The question is, does the guy pull leather
20 and say well, gee -- because your simulator doesn't
21 simulate the noise.

22 MR. YOUNG: Right.

23 MR. LINTHICUM: The simulators don't go
24 into that space anyway.

25 MEMBER POWERS: The calculations are very

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1 sterile. They don't begin to communicate.

2 MR. AMWAY: And that is one of the reasons
3 why the SAMG strategy in this initially when you get
4 in is to maintain containment pressure below PCPL is
5 because when you do initially establish that water
6 flow, you are going to get a lot of steam production.
7 You are going to see pressures come up. You are going
8 to see hydrogen generation to set you up to be able to
9 maintain below PCPL either after the vessel breaches
10 or you do have that water reaction from the initial
11 injection flow until you turn it and quench it.

12 CHAIRMAN SCHULTZ: So, Phil, continue on
13 to answer the question. Does the operators take any
14 other action than continue to add water?

15 MR. AMWAY: Yes, there is nothing in the
16 SAMGs that would direct them to stop adding water.

17 MR. LINTHICUM: So, the expectation is
18 that they would continue to add water, unless directed
19 by the TSE to stop adding water.

20 MR. GABOR: If I could offer a comment.
21 Jeff Gabor, ERIN Engineering.

22 One of the authors of the recent Technical
23 Basis Report, EPRI Technical Basis Report, the first
24 thing, and I think I heard this echo that we are not
25 -- there is never guidance provided to determining

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1 water flow. The indication is always to put water on
2 core in a breach.

3 I think what Mike is saying is that the
4 expectation or the expected consequences will change
5 with time. And those are discussed in the TBR, as
6 pointed out before. There are pros and cons when we
7 get into severe accident space and we get into the
8 uncertainties. There are always pros and cons for the
9 actions that we take and those are clearly discussed
10 in the TBR as well.

11 But what we want to do is we are going to
12 put water on but we want to understand what the
13 consequences are going to be and be able to deal with
14 those consequences, be it that containment -- be
15 prepared for perhaps large hydrogen concentrations in
16 containment are already addressed in the severe
17 accident management based on the symptoms of high
18 hydrogen concentrations and there is actions that we
19 take for that.

20 So, we would never not put water on and the
21 TBR never recommends that but it does identify the pros
22 and cons and the consequences of doing that at certain
23 points in the accident.

24 MEMBER CORRADINI: So, can I ask my
25 question to you, Jeff?

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1 So, from the standpoint of TMI as an
2 example case, you have run through this that nothing
3 will change in terms of how you would address it, based
4 on timing. It is always vessel first and then, at some
5 point, you would, again based on I am assuming top box
6 questions, you would retreat to put the water somewhere
7 else? You know what I am asking?

8 MR. GABOR: Yes, I do.

9 MEMBER CORRADINI: Maybe I am asking it
10 incorrectly.

11 MR. GABOR: No, I do. And Phil and maybe
12 Jay Liter can support this as well.

13 Within the TBR and the guidance provided
14 in the TBR and within the Severe Accident Guidelines,
15 we are always watching full. We are always watching
16 the containment and we are watching the RPV and we are
17 taking appropriate actions to deal with both of those
18 things. So, it is never a situation where I have to
19 pick and choose.

20 For example, when I am trying to recover
21 the core, I am also paying attention to containment
22 pressure. As Phil pointed out earlier, if I progress
23 to a point where I expect the core to come ex-vessel,
24 I am going to prepare my containment for that as well.

25 So, it is never a one or the other.

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1 MEMBER CORRADINI: Okay, thank you.

2 MEMBER POWERS: So, Jeff, the question I
3 am asking I guess is I have gotten into a point where
4 I am worried about both my fuel and my containment, just
5 as you outlined. And now all of a sudden, I am seeing
6 an enhanced threat to my containment. And it caused
7 me pause.

8 I mean you have got a good strategy, just
9 keep adding the water. But I am now asking about the
10 implementer and is he prepared with these sufficiently
11 to understand this could be a very exciting event.
12 This could be a real exciting event. And they will air
13 it in the control room. They will see it.

14 MR. AMWAY: And I agree and I think to the
15 extent that the operator training program goes, they
16 are also going to have the benefit of an emergency
17 response technical report staff that is helping coming
18 alongside the operator to provide them guidance.

19 MEMBER POWERS: Well, I wonder if the
20 technical support staff have ever seen the core
21 experiments and things like that.

22 MEMBER BLEY: I think the key here, or at
23 least a possible key is that the training ought to
24 include some warnings that you are not going to like
25 what you see when you carry out these actions. You had

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1 better be prepared to live through it because you are
2 going to lots of things telling you to undo what you
3 just did.

4 MR. AMWAY: I agree.

5 MEMBER BLEY: And without that, you never
6 know what a guy is going to do. Even with that, you
7 are not quite sure if it really gets scary enough.

8 MR. LEE: When the SAMGs were implemented,
9 we had to create a new word, phenomenology, okay, so
10 we could teach them all the things you needed to know
11 about what we think is going to occur when you have an
12 event where you have lost the core. And when you enter
13 SAMGs, you assume the core damage has occurred, period.
14 Your real goal is to protect the next barrier, which
15 is the containment.

16 MEMBER BLEY: It is one thing to see that
17 rationally. It is another to at least have some
18 warning that this is going to scare the daylights out
19 of you and you are going to get things that tell you
20 not do what you just did.

21 MR. LEE: It is a specific, a great example
22 of what you are talking about is, in a PWR where I have
23 containment pressure that is rising and the guidelines
24 tell me to turn off sprays, to allow pressure to remain
25 high. Okay, one of the reasons that I might want to

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1 do that is to keep hydrogen under control. So, there
2 are some things that are taught and provided in the
3 guidelines and the clarifying actions in the guidelines
4 for the user that is not going to use these all the time
5 to be made aware of when he is there to address these
6 types of actions.

7 So, they very are well laid out. Again,
8 you may be in multiple SAMG strategies at the same time,
9 addressing different aspects. Basically, the
10 evaluation teams are directed to determine which
11 strategies could be implemented based on the criteria
12 of that strategy being needed.

13 An example would be if my reactor coolant
14 pressure is still high and RCS is still somewhat intact,
15 even though I am in a SAMG condition, I want to decrease
16 that pressure so that if I do have a vent with the fuel
17 and I do have a release of that fuel to the containment,
18 that it is a low pressure release to keep it from going
19 to the containment wall structures to prevent damage.

20 So, those are the types of actions that are
21 built into the SAMGs. They are quite detailed but they
22 are positive-negative. You have to be -- the decision
23 maker has to weigh whether or not this particular
24 strategy, the positives outweigh the negatives to make
25 a decision. So, they are very complicated from that

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1 particular standpoint.

2 MEMBER RAY: Dennis, we have been talking
3 about procedures but you just touched on something that
4 I think is going to be discussed, not now but at some
5 point, and that is training. How this training on
6 these procedures that we are talking about here affects
7 the training that traditionally is done to make sure
8 we don't get into these conditions in the first place.
9 That is a big issue in my mind, anyway. And I just want
10 to make note of it here and say we have got to have a
11 discussion about that because we can't undermine the
12 training that is required to operate the plant safely
13 because we are now focused on simulating the effects
14 of a beyond design basis accident.

15 On the other hand, you have got to have
16 training on the procedures or the procedures aren't of
17 any value.

18 And so how the overall training program,
19 I used to be on the accrediting board side, so I am
20 thinking about this, how that is going to be
21 accomplished is something I just want to make note needs
22 to be talked about but this isn't the place to do it.

23 MEMBER BLEY: I agree with you and I will
24 just throw in I always look back at events. Real things
25 have happened. I've talked to people who have had them

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1 happen to them. I know at least three are in my head
2 of events where people did what afterwards they would
3 say was the wrong thing but they did it because they
4 had been biased by some recent drills that they did,
5 that were under particular conditions. The thing that
6 happened wasn't under those conditions, so it behaved
7 differently. So, they actually had a training bias
8 built in that caused them not to see what was going on.
9 And that is the kind of thing we are worried about.

10 Now, if we over-train -- not over-train.
11 If we get a mindset on these, maybe you don't pay
12 attention to weird looking stuff when you don't expect
13 weird looking stuff. I agree with you.

14 MR. AMWAY: And I appreciate that comment
15 because I had the same concern. I mean we have the
16 operator plants every day and the design basis and that
17 is where we want to keep them. And that is where our
18 training focus typically is.

19 Before I leave the topic of SAG, SAMGs, I
20 just wanted to give an opportunity either to Jay Liter
21 or Bill Williamson, if there was anything else you have.
22 You know we have discussed it a lot. I think we are
23 okay but before we move on, it was either Jay or Bill
24 has some comment from the EPC side with respect to SAMGs
25 before we move on.

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1 MEMBER CORRADINI: Are they physically in
2 the room?

3 MR. AMWAY: Jay is in the room and Bill is
4 on the other line.

5 MEMBER CORRADINI: You may have to turn on
6 the line.

7 CHAIRMAN SCHULTZ: No, their line is open
8 --

9 MEMBER CORRADINI: Oh, okay.

10 CHAIRMAN SCHULTZ: -- if they open it.

11 MS. WEAVER: Well, we had to shut it down
12 because it --

13 CHAIRMAN SCHULTZ: I hear them now.

14 MR. AMWAY: Bill Williamson, are you on?

15 MR. WILLIAMSON: I'm on the line, if I can
16 get through.

17 CHAIRMAN SCHULTZ: You are through. If
18 you would like to make a comment, go ahead. Now is your
19 time.

20 MR. WILLIAMSON: I just wanted to address
21 very briefly the question that came up before. As Jeff
22 Gabor said in the Technical Basis Report is guidance
23 on restoring flow to an overheated core. That guidance
24 has made it into the Plant-specific Technical Support
25 Guidelines and that is part of the training; that you

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1 would not turn it off but you would expect to see an
2 increase in pressure due to steaming and increase in
3 hydrogen generation. And so it provides some
4 recommendations based on what happened at Three Mile
5 Island. They think about 5,000 gallons per minute was
6 what stopped the accident sequence there. And so it
7 gives something you are shooting for controlling
8 injection when you come in to control the pressure
9 transient and the hydrogen generation. But the
10 guidance is such that you would not tell the operator
11 to turn off the flow because he sees that he might limit
12 the flow somewhat but we are training him to see what
13 is expected.

14 If you look at the sequence of events on
15 Fukushima Daiichi Unit 1 on March, I think 24th, 25th,
16 you see where they restored injection to an overheated
17 core or core debris and that is when they got a pressure
18 rise and got some other indications. And they
19 controlled that by limiting the amount of flow that was
20 in there and the conditions were controllable. So, I
21 wanted to just point that out.

22 One other thing I would point out is we are,
23 indeed, looking at training and how to make sure it does
24 not impact the operator's normal training but how to
25 make sure that the evaluators and the decision makers

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1 and the implementers do have the procedure network and
2 do have the training that they need to accomplish this,
3 should they ever find themselves there.

4 And I will -- that is the end of my comment.

5 CHAIRMAN SCHULTZ: Thank you for your
6 comment. I will turn it back to you, Phil, to move
7 forward. Thank you.

8 MR. AMWAY: Okay, next is the EDMGs. The
9 real point of this slide is just to make it clear that
10 the EDMGs really have two components to them. The
11 first component is when the loss to the normal command
12 and control structure exists such that the control room
13 staff is unable to implement the EOPs, that the EDMGs
14 can provide that structure for the initial response for
15 whatever operators remain to bridge that gap between
16 the staff that is there available to respond to the
17 event until the offsite organization is established and
18 can transition back to the normal structure within the
19 EOPs or the SAMGs.

20 The other aspect of the EDMGs is the actual
21 how-to procedures on how to mitigate or to implement
22 the specific mitigation strategies in terms of use this
23 portable pump connected to this specific location.
24 So, there is that dual aspect of the EDMGs that exist
25 and that is why we say that the EDMGs can also be used

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1 in support of the SAMGs or the EOPs.

2 Flooding response procedures, we have
3 touched on this a little bit but they are, typically,
4 an AOP is what directs the specific flooding strategy
5 and response actions. It can call out and use FLEX
6 Support Guidelines response to a flooding event. And
7 also these additional procedure classifications are
8 being added in response to the flooding hazard
9 reevaluation in terms of being able to have alternate
10 mitigation strategy guidelines or Targeted Hazard
11 Mitigation Strategy Guidelines. This is something
12 that currently does not exist within that framework
13 now. But as the ongoing efforts to resolve the
14 flooding hazard reevaluations, these strategies and
15 procedure guidelines will be developed to be able to
16 respond to the hazard reevaluations.

17 Dave, did you want to say anything more
18 about the flooding?

19 MR. YOUNG: No, I think that is the right
20 characterization, yes.

21 MR. AMWAY: Thank you.

22 Fire response procedures, again, these are
23 typically driven by the EOP framework. They have a
24 variety of support procedures. The fire response
25 procedures, and I am thinking mostly in terms of

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1 Appendix R-type fire events, that they are very
2 specific in terms of specific fire areas, how to contain
3 the fire within a specific targeted area and to preserve
4 key safety functions using alternate trains that are
5 not impacted by the fire.

6 The importance here is that when you get
7 into a beyond design basis event, the fire is not
8 necessarily going to behave in a manner which you wrote
9 that specific fire procedure.

10 And so now that we assume well, we get into
11 an Appendix R fire event that all the equipment in a
12 particular area is damaged, we have the potential for
13 multiple spurious actuations. So, we try to isolate
14 that equipment and contain that fire within a
15 particular fire area, use our alternate strategy to
16 maintain the safety function, shutdown safety
17 functions.

18 Beyond design basis event, it may or may
19 not plan out that way. I mean there may be equipment
20 that is unaffected in that particular fire area or the
21 actions defined in the fire procedure to isolate that
22 area may contradict what you would want to do on a FLEX
23 support guideline.

24 You know if you isolate it to a particular
25 area, the fire response procedure tells you to

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1 de-energize Bus X and you count on Bus X for your FLEX
2 mitigation strategy, then you have got a decision to
3 make in terms of am I going to execute the fire procedure
4 as is or am I going to modify the response to that fire
5 procedure so that I can successfully implement the FLEX
6 Support Guidelines. And that is where the -- whether
7 that be within the control room or the ERO response
8 organization in their response to an event to be able
9 to be provided the tools that they need to know what
10 strategies are available, what the functions of those
11 strategies and guidelines are, and to make the
12 appropriate decision in terms of executing the specific
13 fire procedure or to implement the FLEX Support
14 Guidelines to respond to beyond design basis event.

15 And so we see that there are definitely
16 some improvement opportunities within there and it is
17 also called out in what was referenced earlier, Section
18 2.5, which talked about providing the ERO alternate
19 decision maker with the guidance they needed to be able
20 to make those type of decisions and recognizing what
21 those guidelines are, what the strategies are, and how
22 they might be modified in response to a beyond design
23 basis event.

24 MR. YOUNG: And so that would be the
25 purpose of that 2.5 to go and take a fresh look at this

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1 and make sure you have got the right guidance that will
2 get you where you need to be.

3 MEMBER STETKAR: Phil, do you know -- and
4 I don't -- I do for the NFPA-805 plants but for the
5 Appendix R plants, are there any Appendix R plants that
6 still have the station blackout response to Appendix
7 R fires, where you actually de-energize all AC power
8 with the idea of possibly rebooting it?

9 MEMBER BLEY: So-called SISBO.

10 MEMBER STETKAR: SISBO. Sorry, I
11 couldn't remember. Thank you, Mr. Acronym.
12 Self-induced station blackout. Are there any?

13 MR. AMWAY: Yes, and the plant I most
14 familiar with is an Appendix R, the plant I was licensed
15 on was Appendix R. We did not have that but what I would
16 like to do is Jay is here, he has experience with another
17 BWR.

18 MEMBER STETKAR: Because of the timing,
19 the last time I asked this the answer was yes, we think
20 there may be one or two but that was a couple of years
21 ago.

22 MEMBER BLEY: Originally, there were only
23 like half a dozen, I think.

24 MEMBER STETKAR: Yes.

25 MR. LINTHICUM: There are a couple I know

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1 of that are transitioning away from that --

2 MEMBER STETKAR: Away from that.

3 MR. LINTHICUM: -- but I can't tell you for
4 certain if there is any left.

5 MEMBER STETKAR: Thank you.

6 MR. AMWAY: So, this last slide really is
7 our conclusion as it relates to 14-01 and procedure
8 integration. I certainly appreciate the robust
9 discussion we have had here. I think that has been a
10 value to both the effort going forward and also to the
11 industry.

12 But in concluding, I would like to just
13 point out that the way we see it and the way we wrote
14 14-01, there are certainly enhancements that need to
15 be made to improve that integration and usability
16 across the different procedure groups that we have but
17 the existing framework itself, in terms of the AOP,
18 SAMG, EOP, EDMG structure is sound, it is based on
19 multiple decades of experience.

20 We do have a robust process in place to
21 incorporate lessons learned from specific events, such
22 as H.B. Robinson and others, that we do go in and modify
23 aspects within that framework but we see this more as
24 an enhancement opportunity to improve that versus you
25 either put another layer of procedures in or to make

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1 substantial changes to the existing structure.

2 We do validate the current approach
3 frequently. It is in a combination of training drills
4 and exercises and we also do post-event reviews, where
5 we do go back and look at operator response to specific
6 events and how they implemented the procedures and are
7 there any shortfalls or gaps within those procedures
8 that hinder your event response capability.

9 And we feel that in concluding trying to
10 shift the focus into a broader change effort in the area
11 of procedure integration has limited additional safety
12 value and that time is best spent in other areas of
13 post-Fukushima response.

14 So with that, I will conclude pending any
15 questions.

16 MEMBER STETKAR: Phil, I have one. And it
17 actually bridges 14-01 and 13-06 but it is not addressed
18 in either set of slides. So, I will bring it up here.
19 And it addresses some of the things we have been talking
20 about a little bit and that is the Ultimate Decision
21 Maker. There are many statements in 14-01 and 13-06
22 regarding the Ultimate Decision Maker and we addressed
23 some of the things we were discussing before. It says
24 the Ultimate Decision Maker should have the authority
25 and capability for direction of an action not contained

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1 in or contrary to procedures or guidelines, if it is
2 determined the action will provide greater protection
3 to the public health and safety. A nice statement.

4 The UDM is able to direct changes to a
5 preplanned prior response strategy, if necessary, to
6 support implementation of an accident or an event
7 mitigation or management strategy.

8 So, the UDM has 13-06, it says the UDM has
9 overall direction on the implementation of the EOPs,
10 FSGs, EDMGs, and SAMGs for a unit or set of units.

11 If I look at the requirements for being an
12 Ultimate Decision Maker, I read things in 14-01 that
13 says following the transfer of the Ultimate Decision
14 Maker function to an ERO position holder located
15 outside the control room, for example in the technical
16 support center, the support staff assisting with
17 strategy and evaluation and selection should include
18 at least one member who holds an active SRO license or
19 has successfully completed an SRO licensing or
20 certification program in the past applicable to the
21 affected on-site units.

22 If I look at 13-06, it says for the UDM
23 qualification requirements should be developed for the
24 positions performing this function. These
25 requirements should ensure that each UDM qualified

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1 individual has sufficient technical understanding and
2 leadership ability to make timely and informed
3 decisions, during a beyond design basis event or severe
4 accident.

5 So, I wanted to get those quotes on the
6 record. I don't read anything that says that the
7 Ultimate Decision Maker, not a staff member, but the
8 person who is making the decisions, needs to hold an
9 active senior reactor operator license for the unit,
10 an active, and has undergone training, both procedural
11 training and simulator training for that unit.

12 And if the answer is yes, the Ultimate
13 Decision Maker must have those requirements, I will be
14 really happy. If the answer is no, I am really curious
15 why not.

16 MR. AMWAY: Okay, and I will start that.
17 And Dave, if there anything else you have to add after
18 I am done, please add it.

19 But the initial event response, the
20 Ultimate Decision Maker is going to be the shift
21 manager. He is the one there. He does have an active
22 license.

23 MEMBER STETKAR: Absolutely.

24 MR. AMWAY: At some point, when the ERO is
25 staffed, that alternate decision maker is going to

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1 transition, most likely out of the control room to a
2 member of the ERO that has the qualifications as you
3 described, either a current or past SRO license or
4 certification --

5 MEMBER STETKAR: I'm sorry, the words say
6 the support staff assisting the strategy evaluation
7 should include one member. It doesn't say the Ultimate
8 Decision Maker has to -- so, be careful because, again,
9 I am reading the words.

10 MR. AMWAY: Yes.

11 MEMBER STETKAR: So, I am asking you if I,
12 John Stetkar, suddenly become the Ultimate Decision
13 Maker, am I required to have an active SRO with training
14 on the procedures and simulator training keeping my
15 license up to date? And that is a simple question.
16 Yes or no?

17 MR. YOUNG: So, the answer is no to the
18 first part, you don't need to be licensed, and yes to
19 the second part, you have to be trained.

20 MR. AMWAY: And before --

21 MEMBER STETKAR: Okay. Now, why don't
22 you have to be licensed and up-to-date on the simulator
23 for that plant?

24 MR. YOUNG: Because you are going to have
25 a support staff member who will have a current or a past

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1 license supporting them.

2 MEMBER STETKAR: And you are allowed to
3 override I, then, as the Ultimate Decision Maker need
4 to take the input from all of these people and I can
5 make the decision. And I am required to make the
6 decision. And I tell the license shift supervisor in
7 the control room turn off that pump. And the license
8 shift supervisor says wait a minute, this guy doesn't
9 have a license. You know, should I do that or is he
10 then just automaton?

11 MR. YOUNG: Yes, so I believe there has
12 already been NRC interpretations in the past about how
13 command and control responsibilities can flow up the
14 chain to the senior level licensee person. So, this
15 isn't any different than any other decisions that have
16 to be made.

17 MR. AMWAY: So, to answer the concern, the
18 shift manager is still in the control room and I see
19 it more as a collaborative effort, in terms of even
20 though that Ultimate Decision Maker authority gets
21 transferred to a member of the ERO outside the control
22 room, they are still communicating and determining the
23 appropriate course of action for the plant.

24 Yes, he has the title Ultimate Decision
25 Maker but he still -- it is not that the licensed staff

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1 becomes the hands of the Ultimate Decision Maker, we
2 will do anything you tell us, there is still an
3 opportunity there for interaction and discussion in the
4 technical decisions and the approaches of the taking.

5 MEMBER BLEY: So, I just have to relate
6 back a couple of years ago in the Navy but I am on watch
7 in the Navy. My boss didn't get effectively licensed
8 on that plant. He took it over but he was licensed as
9 an engineer for all Navy plants but he was the only one
10 who could give me a direct order to do something I didn't
11 want to do. But I could either refuse it and say you
12 have got to put somebody else here because I think that
13 is wrong or I would say I am going to write in the log
14 and I am doing this because you ordered me to and I
15 disagree. And I wonder about the guy who is the
16 licensed guy in the plant when he thinks he is getting
17 bad guidance.

18 And I just don't know. The civilian
19 structure doesn't quite have the same kind of
20 formalisms that let you deal with that, I don't think.

21 MR. AMWAY: And I think it does.

22 MEMBER BLEY: Okay.

23 MR. AMWAY: Because I mean having been
24 there and I have a Navy background as well.

25 MEMBER BLEY: Yes, so how does it work?

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1 MR. AMWAY: But that has been done.

2 MEMBER BLEY: I wanted to hear that.

3 MR. AMWAY: The shift manager was directed
4 to do something and they push back. It is no different
5 whether you are in an event with an ELO Ultimate
6 Decision Maker giving guidance or a long line in senior
7 management would direct me to say we want to keep the
8 plant online and the SRO says no, it has got to come
9 down.

10 I mean that is their function is they are
11 the license holder for that plant and they have the
12 responsibility for protecting public health and
13 safety, even when that is contrary to what they are
14 being directed by although senior but not licensed
15 member of the plant staff. I don't see it as being any
16 different.

17 MEMBER STETKAR: Well, tripping the
18 plant, you tend to use things from sort of what I would
19 call routine events. Tripping the plant when the SRO
20 or the RO feels that stability is threatened is one
21 thing. Turning off containment spray when you think
22 the containment is in trouble or de-energizing buses
23 or re-energizing buses when you think that that might
24 be a bad idea, given the trajectory, it is already a
25 very, very bad day of the plant is something very, very

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1 different.

2 And sitting in the control room as the
3 licensed people responsible for that plant, hearing
4 guidance from an external source, who you know doesn't
5 have the same qualifications and training that you do,
6 can at least be a source of potential delays, confusion,
7 additional discussion and you may not have a lot of time
8 for that delays and the confusion and the additional
9 discussion. And that is the concern.

10 It is, in some sense, actual training and
11 experience but it is also the optics to the people in
12 the control room who know that they are, ultimately,
13 responsible, unless, as Dennis said, there is some
14 formal mechanism that says you have it. I don't have
15 it anymore. It is your job.

16 MR. PAPPAS: I would like to address that
17 also from an on-shift perspective. You may get a
18 contrary or contrary to what you think is an appropriate
19 action certainly in design beyond basis events,
20 something your EOPs are not particularly guiding you
21 with. But I think every shift manager would push back,
22 at least get the understanding of why it is that you
23 want me to turn off containment spray. And in fact,
24 that conversation is going to take place. We are not
25 hands for somebody outside the control room. We still

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1 have responsibility and ownership of the unit.

2 Not only will that shift manager have that
3 dialogue, he is now going to have the dialogue with
4 three other license holders and they would have that
5 responsibility and want to understand why something is
6 being done that they may feel is contrary to what they
7 see on their indications or your training, their
8 current EOP guidance.

9 So, it is, as Bill said, a collaborative
10 effort. There is going to be understanding before an
11 action is going to be taken, especially one that would
12 appear to be contrary to the goodness of the plant.

13 MEMBER STETKAR: Thanks. I'm not sure
14 you identified yourself.

15 MR. PAPPAS: I'm sorry. Nick Pappas.

16 MEMBER STETKAR: Thanks, Nick.

17 CHAIRMAN SCHULTZ: Do we see that
18 happening in drills and exercises ERO activation drills
19 and exercises, that interaction between the control
20 room and the ERO decision maker?

21 MR. AMWAY: Having participated in those,
22 absolutely, I can tell you.

23 CHAIRMAN SCHULTZ: At every plant?

24 MR. AMWAY: Without a doubt.

25 MR. LEE: If I could, this is Walt Lee.

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1 When we implemented Rev. 0 of the Westinghouse, SAMG
2 Owners' Group Guidelines, one of the lessons learned
3 that drove us to move them to one was the fact that we
4 found that in the implementation where we had limited
5 details taught to some of the staff members in the
6 control room, when the edicts came down from the
7 decision maker in the TSC, they were hesitant, like we
8 have been talking about, to implement that guidance
9 blindly because it was contrary to all the things that
10 they live with in EOP space. Some of those things are
11 contrary to actions you would take in EOP space.

12 The fact that we had moved to SAMGs was
13 important for them to realize but also we added tools
14 into the guidance so that the TSC is creating basically
15 a work order. Okay, here is what I want you to do and
16 here is why I want you to do it.

17 And then the discussion with the ops
18 representative or the decision makers between the
19 control room and the TSC had those -- were to have those
20 discussions and have clear direction on what they were
21 doing, why they were doing it, and what the negative
22 aspects of doing it might be and what they should be
23 monitoring to ensure that the action they took, what
24 they think actually had results, and that the results
25 that they got were not contrary to the negative and the

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1 positives that they were expecting to see.

2 So, all of that is built into the guideline
3 structure itself to ensure understanding.

4 MEMBER BLEY: I want to put two things on
5 the table. I don't really want to discuss them but I
6 just want to -- I am saying them for you guys, so you
7 think about this.

8 One is, I have been watching drills in a
9 number of places. And some places the shift manager
10 or whatever they call him, is very much engaged with
11 everyone. And Phil, I don't think you are agreeing
12 with what I am doing but why not. Help me out here.
13 And really listening to everybody.

14 Others still have a little bit of that I
15 am the boss. Yes, I hear you but do what I say. So,
16 that is still out there some, various guy-to-guy,
17 woman-to-woman, plant-to-plant.

18 The other things is, and I won't name the
19 plant because I learned about this from people there
20 and should not identify the plant, but at the event that
21 got pretty serious and lots of people came to the
22 control room, including the VP nuclear was there in the
23 control room and several other advisory people. And
24 they got to a place where the guys said next step I am
25 going to do I think will cause A, B, and C to happen

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1 and nothing else. Does everybody agree? And all of
2 them, including the senior management said yes, that
3 is right, do it.

4 He did it. D also happened, which turned
5 out not to be very good. He ended up losing his
6 license. Everybody else was like I didn't do it. That
7 gets around. That is why I am concerned about this kind
8 of stuff.

9 MR. BONFIGLIO: This is Mike Bonfiglio.
10 I just kind of want to add to the question relative to
11 the shift managers in questioning what is coming in.
12 I think without a doubt the training and exercises
13 supports the shift managers having a questioning
14 attitude and making sure they understand what they are
15 doing before they do it, without a doubt.

16 Having been a shift manager for 11 years
17 and seeing a lot of them, I have been contract training
18 for a long time in the industry and seen a lot of
19 utilities, how they train and exercise their people,
20 and without a doubt, they are building that questioning
21 attitude into the control room staff.

22 MEMBER BLEY: I like to hear that. When
23 I, in various roles, dealt with people in the plant,
24 especially the training folks, and talked to them, and
25 they tell me that our guys never do that. So, you know,

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1 I think what you are thinking about are the guys you
2 like best. We used to have a guy that if he was on
3 watch, I couldn't sleep too well. And all of a sudden,
4 I say, oh, Joe, well, maybe not everybody would do it
5 this way.

6 MR. BONFIGLIO: Yes, and also to add
7 relative to where we are with the Severe Accident
8 Guidelines, the reason we are going to the Enhanced
9 Severe Accident Management Guideline in the PWR world
10 is because we recognize this analysis paralysis think
11 that we ended up because the guidance was not clear
12 enough and was not really providing enough of the
13 benefit-consequence information to the staff to allow
14 the control room to even be informed of why the TSC is
15 recommending what they are recommending.

16 So, the new revision to the Severe Accident
17 Guidelines that we were actually validating the first
18 round this week at the first Westinghouse plants is
19 designed to address that analysis paralysis issue and
20 provide the background information for the guidance,
21 along with the guidance, as well as benefits and
22 consequences of the actions that are being taken.

23 MEMBER STETKAR: I will just ask one last
24 and it is a rhetorical question. I don't want an
25 answer. We are running late.

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1 But what is the downside of not requiring
2 the Ultimate Decision Maker to have an active SRO
3 license that he or she keeps up to date?

4 I hear a lot of things about yes, there is
5 going to be good discussion. But I don't quite
6 understand what the downside of actively saying no,
7 that is not required.

8 MR. YOUNG: And part of that, you limit
9 your pool for site emergency directors.

10 MEMBER STETKAR: Oh, well.

11 MR. YOUNG: Well, you asked the downside.
12 That is the downside. But we have very qualified
13 individuals. We have a very good support staff. They
14 have great leaders and they call the right decisions.
15 So, to exclude them from that wouldn't seem to be very
16 --

17 MEMBER RAY: John, we should talk about
18 this further later, when it is not critical because of
19 the time frame. Because I have an answer for you but
20 I don't want to go into it now. I mean it is maybe not
21 a satisfactory answer but it is a response.

22 CHAIRMAN SCHULTZ: Phil, we are
23 in-between now the NEI Guidelines, our documents, so
24 we are going to take a break now and return at 10:30.
25 The same panel will continue. We are a little bit

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1 behind the schedule that we advertised but we knew that
2 this was going to be an important discussion this
3 morning.

4 So, we will break until 10:30.

5 (Whereupon, the above-entitled matter
6 went off the record at 10:16 a.m. and resumed at
7 10:30 a.m.)

8 CHAIRMAN SCHULTZ: We're ready to start.
9 We're back on the record. The next discussion is on
10 NEI 13-06 and we will move right into it.

11 Dave? Walt? Thank you.

12 MR. LEE: I am Walt Lee with Tennessee
13 Valley Authority and I will be talking on NEI 13-06
14 guidance relative to the enhancement of emergency
15 response capabilities for beyond design basis events
16 and severe accidents.

17 I am going to address some aspects of the
18 regulatory basis for different areas of recommendation
19 8 and also recommendation 4.2 and 9.3.

20 There are four specific areas that are
21 addressed in 13-06 and the first one in section 2 is
22 multi-unit or multi-source data assessment. And this
23 area talks to the implementation of this that was to
24 be completed at the end of last year. And we have a
25 few that are still completing that in 2015.

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1 But this allows us to perform dose
2 assessment for all units that the site might have and
3 all release points that the site might have, including
4 the spent fuel pool. So, we can get an aggregate look
5 at the dose to the public and take appropriate
6 protective action recommendations based on that dose
7 release. This is one of the areas that was determined
8 to be less than fully implementable at Fukushima. So,
9 it was an aspect that the industry took on and has
10 completed.

11 The next Section 3 of the document talks
12 to training enhancements utilizing the SAT-like
13 process per 10 CFR 55.4 and ensuring that the aspects
14 of a SAT process to include analysis of the jobs needed
15 to be done, training materials, objectives, the
16 delivery methods and frequency, as well as evaluation
17 techniques and the revision of the training based on
18 performance through the evaluation process are all in
19 place.

20 And it also talks specifically to ensuring
21 that you are maintaining a balance or an appropriate
22 balance between your design basis training and your
23 beyond design basis accident training.

24 It does talk somewhat to the Ultimate
25 Decision Maker, as we already talked about earlier this

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1 morning but it references most of the aspects and traits
2 of the Ultimate Decision Maker back to 14-01, as we
3 discussed.

4 The third area in 13-06 talks to facilities
5 and equipment and the fact that there is training that
6 is required for the new equipment that has been placed
7 on the site in a protected manner and also includes
8 satellite phones and things like that for
9 communications in the 9.3 recommendation.

10 Lastly, and probably the one that we will
11 talk about the most is the beyond design basis event
12 response drills. Specifically, sets up and describes
13 the demonstration capabilities for effective
14 integrated use of accident mitigation and management
15 procedures and guidelines and sets and focuses on
16 ensuring that the developers of the drill and exercise
17 scenarios are going to build them such that we do
18 exercise transition between strategies that are to be
19 demonstrated and the processes of selecting the best
20 strategy, as we talked about in SAMGs as well as EDMGs.

21 It does talk specifically to attributes.
22 And some of the key attributes that it talks to is the
23 inclusion of making sure that you are working this with
24 your emergency response organization and using your
25 normal EP procedures. This is not a new group. This

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1 is the same ERO that you have on-site all the time or
2 you all in an augmented fashion and that the EP groups
3 should be involved in that to ensure that you get the
4 high quality drills, just as you do in the radiological
5 emergency preparedness program.

6 It talks to allowances for combining the
7 drills with other drills. So, you may not just run a
8 beyond design basis drill but you may run a normal
9 radiological emergency preparedness drill and then be
10 able to add on, tack on to that a strategy that you
11 wouldn't normally use and demonstrate the capability
12 to use that, something that comes out of one of the other
13 areas or you may have a mini-drill at the end of the
14 scenario, after you have got your ERO in place, where
15 you do a time jump and it talks about how time jumps
16 are helpful but also warn you, clearly, that time jumps
17 are hard to manage.

18 And then it also talks about all the normal
19 aspects of how you should ensure that you include those
20 members of the organizations that support you. They
21 don't necessarily have to play but it is important for
22 you to go ahead and look at inviting your offsite
23 response organizations to play, so that they understand
24 the differences between the design basis and the beyond
25 design basis integration of their plan with your plan.

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1 It talks about simulator usage and the fact
2 that simulators may not be modeled to demonstrate and
3 be useable for all aspects of beyond design basis. We
4 talked a little bit about that earlier but it goes on
5 to make sure that you take your best estimate actions
6 towards developing the paper drill scenario, if you
7 will, and ensuring that you are utilizing scenarios
8 that your ERO to train on all the units that are affected
9 whenever possible.

10 From a drill standpoint, again, there are
11 multiple objectives that has an appendix, which
12 provides a complete list of objectives that have been
13 worked with INPO's PO&Cs and also list a mitigation
14 strategy list. And mitigating strategy is one of the
15 requirements, one of the types of drills and there are
16 four specific types of drills that are talked to.

17 One of those is for you during the
18 eight-year cycle following mitigating the damage
19 rulemaking implementation, you should demonstrate your
20 capability to utilize strategies. But it also says
21 that if you have a strategy, for instance, to fill the
22 steam generator using your portable pump and you have
23 that as a strategy that exists in your SAMGs, as well
24 as you EDMGs and in your FLEX, that if you demonstrate
25 it for one, you don't need to demonstrate that strategy

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1 again for each one of those strategies you have in each
2 one of those different guideline sets.

3 So, that is some good healthy guidance that
4 has been added to 13-06.

5 The other three types of events that
6 specifically calls out that you will complete during
7 your eight-year cycle is an AOP or EOP, depending on
8 how you set up your procedures, transition from a
9 scenario to a FLEX scenario. And you would demonstrate
10 that FLEX scenario through the time period where you
11 had Phase II actions that needed to be completed and
12 your limited access of your ERO staff back to your site.
13 Typically, that is six hours, unless you have come up
14 with some other value or have substantiated that with
15 some technical basis.

16 It also, during that FLEX drill, makes sure
17 that you go through the steps that are necessary for
18 you to request the Phase III FLEX equipment from the
19 NRRC, the Regional Response Center.

20 So, again, that Phase III, those actions
21 are not actually saying you need to have the equipment
22 delivered from Memphis or Phoenix but that you would
23 make sure that your processes for requesting that are
24 done. There have been other demonstrations of the
25 capability of the RRC to activate and to deliver through

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1 pilots that have been conducted. And I know there is
2 a national level exercise in July where that is also
3 going to be demonstrated at a very high level.

4 MEMBER STETKAR: Walt, let me interrupt
5 you for just a second because I am going to have to leave
6 in about ten minutes and you have raised a couple of
7 things that I wanted to ask about.

8 One is these drills. If I read the
9 guidance, the guidance for the drills, to me, indicates
10 that the various types of guidance are drilled on in
11 what I call a pair-wise function. In other words,
12 there is one drill that tests transition from the EOPs
13 to the FSGs. There is another drill that tests
14 transition to the SAMGs. There is a third drill that
15 tests transition to the EDMGs.

16 And the boundary conditions that are set
17 up, for example, for the SAMGs, it explicitly says the
18 drill would begin with conditions that are degrading
19 into those requiring a transition into the SAMGs. What
20 I don't see is really an integrated drill that looks
21 at conditions that begin and looks at integration of
22 the FSGs, the SAMGs, the EDMGs, for example, a fire or
23 I hang up on fire. Something serious.

24 How does the drill process examine whether
25 all of those things fit together, not paralyze but fit

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1 together as they would expect to be exercised in a
2 real-world, evolving scenario?

3 MR. LEE: I will attempt to answer part of
4 the question. David, jump in at any time if you feel
5 the need to.

6 I'm a scenario builder from way back, an
7 SRO for 20 years, Navy nuc but I have been building
8 drills and running drills for a long time. And again,
9 the SAMGs, the criteria, every apocalyptic event that
10 we have results in a new set of guidelines and we have
11 already talked about that. So, how do they integrate
12 with each other?

13 Again, they are event-based but you would
14 transition. And I am going to take an example. For
15 instance, let's talk with the FLEX, since that is the
16 latest set of guidelines that we have. So, the event
17 that we are talking about here could result in the fires
18 that you talked about several times during this
19 meeting. It could result in damage to equipment that
20 we are not aware of. So, it is a very varied type of
21 scenario.

22 So, most radiological emergency
23 preparedness scenarios are going to run down that same
24 line. You are going to have an event. In this
25 particular case, we are going to assume it is an

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1 external event that causes damage. You have got
2 equipment that is broken so, you are taking actions to
3 return that equipment and you ultimately determine that
4 you have a loss of all AC condition and you are not going
5 to be able to restore it with your normal conditions.

6 That is the first drill that is described
7 in 13-06 that we just talked about. And we would
8 transition into the FLEX procedures from the EOPs, with
9 the EOP still guiding our actions in FLEX space to
10 implement strategies that would, hopefully, prevent us
11 from going to SAMGs.

12 If all of the FLEX equipment that we have
13 fails and we still go to SAMGs, it was a really, really
14 bad day.

15 Most of the events that drive us to SAMGs
16 now, where we don't implement FLEX, for instance, I
17 can't shut down the core and I am in a high-powered ATWT
18 condition and I melt the fuel well before he may even
19 have an RCS leak. I have damaged the fuel and I have
20 exceeded my design basis so now I have entered beyond
21 design basis conditions for SAMGs. That is one
22 example.

23 So, that condition I don't have
24 opportunity to prevent core damage using FLEX equipment
25 and in the SAMG entry directly from the EOPs, once I

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1 have exceeded and moved out of design and licensing
2 space into the space of SAMGs, I go directly there. And
3 that is what the next drill that is talked about in the
4 13-06 documents, making sure that you do use that
5 process.

6 Now, if I was in a FLEX condition, my first
7 scenario and things weren't working, there may be other
8 strategies in SAMGs that would allow me to add water.
9 Water is always good. But the issues is that if I did
10 not have core damage in FLEX -- if I have core damage
11 in FLEX, then I need to go to SAMGs and SAMGs then shifts
12 over to the mindset of protecting the containment. So,
13 final barrier to release of fission products. So, the
14 restoration is not there.

15 So, again, the Ultimate Decision Maker, I
16 believe, does have -- would have the knowledge and
17 training necessary to move from one to the other, if
18 it actually became necessary.

19 MR. YOUNG: Well, and I think that the
20 drill guidance is developed to recognize the boundary
21 conditions for the different guideline sets. But the
22 key is, you are going to see the transition from E to
23 C between those different guideline sets that are going
24 to be in play.

25 So, you are going to start in the EOPs.

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1 You have a bad day, ELAP, you go into FLEX. You are
2 going to do that transition. You are going to
3 implement your FLEX Support Guidelines.

4 We should be successful in doing that.
5 That is going to prevent core damage and that drill
6 should end with a successful demonstration of FLEX
7 capabilities.

8 So, if you are going to come back for your
9 next drill, you can set things up to initial conditions,
10 something happened 12 hours ago. You have got FLEX in
11 place. Maybe you had your second seismic event, a
12 second flood, whatever it could be. Now FLEX is
13 disabled. And as you read, that one quote you read from
14 the 13-06 guidance, you are bringing the players to the
15 point where the conditions are starting to drive entry
16 into the SAMGs. So, there is that transition you are
17 going to see out of the EOPs into the SAMGs.

18 So, it is meant to provide focus drilling
19 on transitions between the guideline sets and, in some
20 cases, without sitting there with 12 hours of dead time
21 that you may see in a real event that just isn't going
22 to be productive drill and learning time.

23 MEMBER STETKAR: Thanks. I have to get in
24 one more question. You haven't actually answered my
25 concern about drilling on integration of these

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1 procedures, which ostensibly is the whole purpose of
2 developing this framework because any bilateral entry
3 into testing pair-wise transitions does not test any
4 integrated response. It does not test an integrated
5 response.

6 The footnote, in total, says for example,
7 the beyond design basis, seismic event occurred several
8 hours ago that resulted in implementation of FLEX
9 strategies. A second beyond design basis seismic
10 event, you are reading the same thing I was, occurred
11 that impacted the ability to sustain one or more FLEX
12 strategies and more hours of the lapse. The drill
13 would begin, this is a SAMG drill, with conditions that
14 are degrading into those requiring a transition into
15 SAMGs.

16 I think if I were actually looking at how
17 these procedures work together and how people use them,
18 I would really like to see how the operators went
19 through that process in an integrated sense.

20 MR. YOUNG: You will. You are going to
21 see the transition into the EOPs into the --

22 MEMBER STETKAR: Pair-wise.

23 MR. YOUNG: All you are doing is cutting
24 out the dead time of where the FLEX equipment failed
25 and the heat-up took over, which could be four, five,

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1 six, eight hours.

2 MEMBER STETKAR: And you are not doing
3 that in real-time with the same operators. You are
4 saying, John, today we are going to test on this
5 transition. Here are the conditions that you must
6 assume that happened and now we will start the drill.
7 That is a much different condition than saying it is
8 getting to be a really bad day. How am I going to use
9 this integrated guidance?

10 I have an example this afternoon that will
11 point that up but I need to run.

12 The second thing that you brought up, Walt,
13 is this six hour magical response time that comes in
14 in NEI 12-01, which I won't be here to ask about. The
15 guidance in NEI 12-01 says it is okay to assume that
16 you will have some -- I have forgotten the exact quote
17 and I don't have time to look it up here -- but it is
18 essentially limited site access during the 6- to
19 24-hour period. As I read a lot of the other guidance,
20 that guidance seems to presume that limited site access
21 means you have everybody available that you need at six
22 hours. If that is not true, I would really like to
23 understand that because a lot of the other guidance says
24 according to NEI 12-01, at six hours, you will have
25 offsite support that is adequate to perform whatever

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1 functions you are looking at. And that, to me, is
2 different than saying people might start to be able to
3 get to the site at some time around six hours.

4 So, if the other guidance doesn't
5 effectively take credit for the full complement of
6 everybody that you need there at six hours, and that
7 six hours is magical in some sense because you say that
8 you need to get electric power back to some things
9 within about eight hours to save the containment. I
10 am curious how that six hours is interpreted in
11 practice.

12 MR. DRIEHAUS: Well, I can speak to the
13 staffing assessments. I'm Paul Driehaus. I'm from
14 Exelon.

15 When we do our staffing assessments, we go,
16 essentially, by the scenario that is developed in the
17 integrated plan. That is the baseline we are looking
18 at. It may be modified at a particular site, based on
19 the kinds of conditions that have been reviewed since
20 that time and some of the more specific event analyses
21 that have gone in that interim period.

22 But essentially what we are looking at is
23 with the minimum staff you have, can you perform
24 everything you need to get done within that six-hour
25 period and if you have anything that has got to be

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1 started in order to successfully complete it beyond the
2 six-hour period.

3 So, for example, if you have --

4 MR. YOUNG: Using only the on-site staff.

5 MR. DRIEHAUS: If for example you are
6 going to have to start, say spraying your spent fuel
7 pool at eight hours, you are going to have to start
8 staging that equipment and aligning it and setting it
9 up. So, we are working on the assumption that we are
10 not counting on putting everything off that is beyond
11 six hours until six hours and say the cavalry is going
12 to come in and we will immediately have enough people
13 to do whatever we want to. We are specifically trying
14 to look at it from the standpoint of have we done
15 everything that we need to do within that six hours to
16 be successful, recognizing that we may get some
17 additional people starting at six hours but certainly
18 not assuming that we have a full complement of whatever
19 we need at six hours.

20 MEMBER STETKAR: I'm glad to hear that
21 but, again, as I mentioned earlier, all we have is the
22 guidance and I can read words in the guidance, not in
23 12-01 or 12-06 but in other guidance, that seems to give
24 me the indication that I can take full credit for
25 anybody that I need, beginning at six hours from

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1 offsite.

2 MR. DRIEHAUS: I can only speak to how we
3 are approaching it. That's us.

4 MEMBER STETKAR: Okay, so that is part of
5 my compartmentalization issues that a lot of other
6 guidance that I have read points back to 12-01 and says
7 according to 12-01, at six hours, we will have offsite
8 support and we can take credit for that offsite support
9 for the following functions, whether that is lining up
10 an alternate source of AC power or whether it is getting
11 portable pumps connected or whatever. The other
12 guidance says that. According to the guidance in NEI
13 12-01, we can take credit for offsite support at six
14 hours.

15 MR. DRIEHAUS: Just to be clear, what it
16 says is ERO arrival -- arrival of ERO staff, emergency
17 response organization staff. That is what 12-01 is
18 talking about.

19 MEMBER STETKAR: That is what 12-01 is
20 talking about. I'm talking about the other guidance
21 that points back to 12-01 and the assumptions in that
22 guidance about who and how many of these are available
23 at the site at that six hours.

24 MR. LEE: 13-06, you are saying.

25 MEMBER STETKAR: Not 13-06 either but

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1 13-06 addresses it peripherally. I don't have the one
2 in front of me and I have to run here.

3 MR. LEE: One of the work activities in
4 12-01 was to look and see who is it. So, if you have
5 limited access of six hours, who do you want to be there
6 first. So, we assume you don't even have helicopter
7 access until six hours.

8 MEMBER STETKAR: Look at 13-02 and,
9 unfortunately, I am going to have to run because that
10 is, in particular, the severe accident venting for BWRs
11 and what assumptions are built in, in terms of what
12 capabilities and functions you have available in the
13 post-six-hour time period. And that points back to NEI
14 12-01 as justification for having those capabilities
15 available. That was one area that I located and I know
16 a couple of other places point back to 12-01 for the
17 six hours. But that was the place where I had the
18 biggest question about it.

19 MR. YOUNG: Well, at least the intent in
20 12-01 was that the emergency response organization
21 members would be available at six hours.

22 MEMBER STETKAR: All of them would start
23 to arrive.

24 MR. YOUNG: A significant number enough
25 that you could support the implementation of the

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1 strategies. All means everything but a significant
2 number would arrive at the support implementation of
3 FLEX strategies.

4 And in fact, there was information that had
5 to be submitted in the 90-day response that licensees
6 sent in that had done coordination activities with
7 states, and locals, and whatever else to provide
8 assurance or high assurance, reasonable assurance that
9 you would get those folks there within six hours.

10 CHAIRMAN SCHULTZ: Well, is the facility
11 fully operational? Has it been declared operational?
12 What is the status of the facility in the interactions
13 with the community?

14 MEMBER STETKAR: I'm going to have to
15 leave.

16 MR. YOUNG: Well, that is a long-ranging
17 question.

18 If you have an emergency operations
19 facility offsite, then depending on how far it is away,
20 you have that facility could be activated very shortly
21 after the event occurred. So on-site the facilities
22 themselves wouldn't be activated for quite some time
23 but I think most sites have made arrangement to use
24 alternate facilities at some distance away from their
25 site as a staging area and a mustering area and those

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1 folks could be up and running fairly quickly to provide
2 some kind of technical assistance to the plant.

3 But again, back to John's point again, the
4 12-01 part, at least as Paul was speaking to, was at
5 arrival of emergency response organization members to
6 the site at six hours, based on the arrangements that
7 folks negotiated or talked about with their state and
8 local support agencies.

9 CONSULTANT SHACK: Well, what seems to be
10 vague, though is the people start to arrive at six hours
11 and everybody is there at 24 hours but it is kind of
12 vague as to how many people are arriving say between
13 six and eight hours.

14 MR. YOUNG: Yes, we had to write it a
15 little bit like that because it does vary a little bit
16 from site to site. It depends on what kind of
17 arrangements you made with your state and local
18 agencies. So, you have to write it a little bit --

19 CONSULTANT SHACK: Yes, but it sounds like
20 additional staffing may be considered available beyond
21 six hours consistent with 12-01. Well, how many
22 additional staff and what additional staff when you are
23 doing the thing is, I guess, where John was getting to.

24 MEMBER BLEY: Of course if they had this
25 all spelled out in detail with say well, it really

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1 depends on the specific events and the conditions there
2 and why are you being so precise. I think it is an area
3 that is kind of tough to predict.

4 MR. LEE: I can tell you, for instance, our
5 analysis that we did assumed that at six hours, we had
6 helicopter capability. Our utility has access to
7 approximately seven helicopters at that time period and
8 we looked at okay, so each one can carry five people
9 comfortably and the pilot. So, who is it that you want
10 to be on the first helicopters. Is it TSC staff? Is
11 it maintenance? Is it electricians to restore
12 electrical power? And it becomes dependent on the --

13 CONSULTANT SHACK: So all that comes up,
14 actually, in your own integrated plan. The guidance
15 is general and broad and that will then vary from site
16 to site.

17 MR. LEE: Yes, and at 24 hours we assumed
18 that we have been able to work with our local offsite
19 organizations in the state, organizations to clear
20 road. So, we now have the ability for people to
21 actually drive to the site. And it is no longer a
22 limited access from the aspect of helicopter flights
23 and things like that.

24 MR. AMWAY: And that is how we handle the
25 first two as well. We don't count on full ERO staffing

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1 until 24 hours and their integrated plan or the
2 development of their plans will develop time lines and
3 the PSAs that we plan to do to make sure that we can
4 install generators and pumps starting with the staff
5 which we have, which is minimum staffing between start
6 of the event and six hours. All that would have to be
7 done within that time frame.

8 And we have been typically been looking at
9 a similar scenario as TVA as far as having the
10 helicopters coming. And typically assuming that the
11 priority for getting people to the site is going to be
12 the operator's RPs, maintenance technicians,
13 electricians, in order to support whatever you might
14 have to do in Phase II beyond the six-hour period but
15 it is going to be phased, based on the logistics of
16 trying to get those helicopters in the site. And we
17 are trying to take that into account as we go through
18 the staffing assessments and making sure that we are
19 getting stuff done in that first six hours and any prep
20 actions we need to start in those six hours so that when
21 you can start getting people in, you know that even with
22 a helicopter had time because you certainly can't land
23 multiple helicopters at most of our sites, especially
24 under these conditions. You would be getting enough
25 people in to help you with for spelling some of your

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1 operators who are probably --

2 MEMBER BLEY: Is everybody planning for
3 the availability of helicopters, just in case we can't
4 get in with vehicles? I know two of you have said that
5 but I didn't know if that was general.

6 MR. DRIEHAUS: I can speak to Exelon that
7 that is part of what we are looking at.

8 MR. YOUNG: I think people look at a range
9 of helicopters, off-road military vehicles, if they
10 have got a National Guard unit nearby. There is all
11 kinds of things folks have looked at.

12 CHAIRMAN SCHULTZ: Paul, back to your
13 comments related to training and then exercises also.
14 You mentioned earlier the systematic approach to
15 training and one of the pieces that you identified there
16 was that we want to have the right balance between the
17 training associated with plant operation, emergency
18 procedure implementation, as compared to severe
19 accidents and FLEX.

20 When one gets to the discussion related to
21 the drills and exercise, you also mentioned there that
22 there is at least thinking going on that in an exercise
23 of the year, let's say, you would potentially have the
24 opportunity to add elements associated with FLEX,
25 associated with severe accident management as a part

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1 of the drill or exercise, a what if and then move
2 forward.

3 I would just like to say that I am glad to
4 hear that and I think it is very important that we work
5 forward to that balanced approach, not focusing whole
6 heartedly year by year on the severe accidents but
7 certainly integrating some aspect of it into the drills
8 and exercises.

9 Training is one thing. The experience
10 that one can get in working on the drill or exercise
11 and then doing the post-job review is extremely
12 important in addressing the types of things we have
13 already discussed this morning to get people engaged
14 and involved in understanding what a severe accident
15 could look like, could be like, and what the response
16 needs to be. So, I would encourage more focus in that
17 area going forward, while maintaining that balance.

18 MR. LEE: And I would just like to make
19 sure that the ACRS understands that we have been using
20 SAMGs now since '91.

21 CHAIRMAN SCHULTZ: That's correct.

22 MR. LEE: And I can't speak for all
23 utilities but all of the utilities that I have been
24 involved with, we have always run a SAMG drill for each
25 team so that if they were three teams rotating, that

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1 that team has a SAMG drill every three years. If they
2 were four teams, then they had it every four years.
3 Right now, I have a four-team rotation. So, I do a SAMG
4 drill for each site, each year.

5 CHAIRMAN SCHULTZ: Well, that is what I
6 wanted to be sure, that we weren't leaving that behind
7 because now we have this bigger and better thing
8 associated with FLEX and integration with Severe
9 Accident Management Guidelines, that we were leaving
10 that behind but really building upon it.

11 MR. LEE: Yes. So, again, the structure
12 of 13-06 talks to the SAMG drills, the FLEX drill, and
13 to the EDMG that we had talked about, which is
14 different. We now have a rulemaking, EP rulemaking for
15 hostile action-based exercises once every eight years.
16 But this is a different EDMG drill. This is the loss
17 of command and control drill, potentially, you don't
18 have to run that every time but it is, obviously, a very
19 bad day if an event occurs where the normal command and
20 control structure is no longer there and you need to
21 utilize the EDMGs that provide the guidance to the
22 individuals who may not be the normal commanders
23 on-site. And in fact, they probably won't be. And
24 they need to do some specific things to make sure your
25 plant is put in a safe condition quickly until the

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1 cavalry arrives in one to two hours to reestablish the
2 normal command and control structure.

3 So, that is the other facet of the beyond
4 design basis drills, which is extremely important to
5 be able to show the events. Now, that EDMG drill could
6 very easily go and be integrated into the demonstration
7 of other types of drills, such as wouldn't really meld
8 with a FLEX drill where I could use FLEX strategies and
9 it could be easily melded with a SAMG, where I was unable
10 to reestablish controls or shutdown the unit or
11 multiple scenarios that you can drive.

12 MEMBER RAY: Well, you are using the word
13 drills. I understand drill. Drills aren't the same
14 as training but you need some training for drills.
15 Could you comment on the training, not the drills but
16 the training?

17 MR. LEE: Well, I will. I think drills
18 are training but they are demonstration, they are an
19 evaluation process for the results of your training.
20 But SAMG training is a required training process
21 already. There is FLEX training. Part of this
22 process ensures that we are setting up the
23 administrative controls to ensure that all the people
24 that need to be trained for but new FLEX strategies in
25 an appropriate balanced manner.

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1 MR. YOUNG: And that process will be
2 SAT-based.

3 MR. LEE: And it is all SAT-based. And
4 then as I indicated before, one of the important parts
5 of any drill is to critique or any training is an
6 evaluation, whether it is an exam or a performance
7 evaluation, a job performance measure, a DLA, whatever
8 tools that you are using to ensure that performance is
9 adequate, all of that has to be factored into the SAT
10 process to ensure that any issues found in the
11 evaluation process are evaluated as to whether or not
12 additional training is needed, additional performance
13 activities are needed, or whether or not procedural
14 changes are required to ensure that an evaluated gap
15 is closed.

16 MR. YOUNG: So actually, maybe to both
17 your points, just maybe in close just to stress so both
18 in the training realm and in the drill realm, so in
19 training it is going to be the SAT-based process. It
20 is going to have you into a systematic look at what these
21 folks have to do and come up with the tasks that need
22 to be trained on and so forth and then as well in the
23 drill space.

24 So, we are not just going to leave SAMG
25 sitting off to one side. In fact, there will be new

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1 requirements in addition to the SAMGs for both FLEX and
2 EDMGs, as well as a strategy equipment, use of the
3 equipment that supports these implementation of
4 strategies across all three guideline sets.

5 So, it is going to be a pretty robust series
6 of actions to make sure that folks have the knowledge
7 and skills they need to be successful and then go out
8 and demonstrate that they can do it periodically, those
9 drills will be critiqued; action items will get put back
10 into the corrective action program, so you are getting
11 that kind of continuous improvement. I just wanted to
12 stress that as well.

13 CONSULTANT SHACK: Just out of curiosity,
14 do the drills come at sort of the end of the training
15 range? That is, if you train every four years, do you
16 drill them four years after they have been trained? Do
17 you drill them right after they have been trained and
18 then they are sort of presumably -- there is no syncing.

19 MR. YOUNG: The guidance allows some
20 flexibility there. It is interesting because Walt has
21 not seen this yet. I have an EOP Working Group meeting
22 this afternoon, where we will be talking about this.
23 We have come up with some scheduling examples that sites
24 could use to try to slot these drills in periodically
25 through some of the already scheduled ERO drills to try

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1 to make sure you are maintaining the skill sets over
2 the eight-year period and yet not make it so onerous
3 that you are detracting focus from let's say higher
4 probability events, tube ruptures, LOCAs, those kinds
5 of things.

6 So, we will have some scheduling examples
7 that we think will try to strike a balance there when
8 they plan these drills.

9 MEMBER RAY: Well you know, we have
10 emergency plan drills forever. This is much bigger
11 than that, of course. But, nevertheless, we had
12 training in support of EP drill and that training was
13 not part of licensed operator training. It was
14 training but it was not part of what we did to maintain
15 operator licenses.

16 Understanding that difference in how it is
17 going to be carried forward is part of what we need to
18 do. Not now, but I am just saying we need to understand
19 it, ultimately, because like I say, many of us have done
20 EP drills for 40 years and you do training for that,
21 too. And there is a lot of people involved in that
22 training, some of them part of the licensee's
23 organization, some of them not. And how that kind of
24 training that you do for EP drills, which are always
25 evaluated very systematically and you identify things

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1 that need more work and so on, how that compares to the
2 training that we are all also familiar with that is
3 involved in operating the plant is one of the things
4 that will be of interest.

5 Again, I don't want you to try and answer
6 it now because I think it would be --

7 MR. YOUNG: I was ready to pounce on that.

8 MEMBER RAY: I'm just saying I think you
9 are in the midst of working that through but it is one
10 thing that needs to be on the table for our
11 understanding when you decided how it is going to be
12 done.

13 MR. YOUNG: So let me just say, as part of
14 the reactor oversight process, when you do drill and
15 exercise performance indicators in the control room,
16 I mean you have to evaluate their E plan implementation
17 capabilities. That is just required. You have to
18 critique it and put in the corrective action programs.
19 I think a lot of that maybe has changed.

20 MEMBER RAY: No, what you are talking
21 about, emergency plan that involves lots of people and,
22 as I say, not even licensee employees but public
23 agencies and stuff like that, training is conducted in
24 that realm. So, there is sort of a continuum maybe that
25 we are talking about.

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1 What we are dealing with today is much more
2 than what I am referring to. Much more specific, much
3 more detailed. But nevertheless, it does involve
4 people who are not part of the licensed operator
5 training program, presumably, and that is what needs
6 to be better understood. But again, I am not urging
7 we do that now because I think we are in the midst of
8 coming to decisions about that.

9 MR. LEE: Well, as far as the
10 implementation process for FLEX, we already have
11 identified that it goes, obviously, well beyond
12 licensed operators. Maintenance, engineering, all
13 have specific training. And even the people that don't
14 necessarily receive that level of training, they needed
15 to know about what their part of the FLEX program Phase
16 III, receipt of equipment from offsite and things like
17 that. So, the level of training is commensurate with
18 the new skills and knowledge. And then the frequency
19 of that training is what has to be evaluated, based on
20 performance that we see coming out of drills to ensure
21 that maybe the frequency of doing that training
22 initially needs to be more than what we are starting
23 with.

24 MEMBER RAY: Yes, and I think, again, as
25 we have said earlier, not impinging, not having this

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1 impinge upon the training that is so critical to the
2 safe operation of the plant on a day-to-day basis is
3 an important decision, how to make those judgments, how
4 to evaluate them looks to me like still in the picture
5 here. At least as best I can see it. It is not
6 something that automatically falls out of what we have
7 been talking about.

8 CHAIRMAN SCHULTZ: Thank you, Walt.

9 MR. LEE: That is all I have. Thank you.

10 CHAIRMAN SCHULTZ: Let's move forward to
11 the next NEI document.

12 MR. DRIEHAUS: I'm Paul Driehaus. I'm
13 from Exelon.

14 CHAIRMAN SCHULTZ: Thank you, Paul.

15 MR. DRIEHAUS: I am here to address NEI
16 12-01. Just as a brief overview, 12-01 was developed
17 to assist in preparation of responses to the 50.54(f)
18 letter that was dated March 12, 2012, specifically, the
19 staffing and communications aspects.

20 So, it provides the recommended criteria
21 to assess the staffing required for beyond design basis
22 events -- external events, that resulted in extended
23 loss of AC power and all on-site units. It also
24 addresses the criteria to identify enhancements that
25 could provide means to maintain communications during

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1 an extended loss of AC power. And 12-01 was endorsed
2 by the NRC staff in a letter dated May 15, 2012.

3 And some of the actions that have taken
4 place to date, the communications assessments that were
5 required in the licensee's responses for NEI 12-01 were
6 completed. The actions to implement the enhancements
7 identified based on the NEI 12-01 assessments are in
8 progress.

9 For staffing, the Phase I assessments,
10 which were based on the pre-FLEX capabilities, were
11 completed and submitted in April of 2013, based on the
12 NEI 12-01 requirements and the licensee's 60-day
13 responses for the 50.54(f) letter.

14 The Phase II staffing assessments have
15 either been completed or in-progress. Those staffing
16 assessments include the FLEX capabilities. The timing
17 is staggered based on the first FLEX implementation
18 outage for the first outage tied to FLEX implementation
19 outage at each site. And it is the first second
20 refueling outage after February 28th of 2013.

21 MR. YOUNG: So, that is why some sites are
22 complete and some sites are still --

23 MR. DRIEHAUS: Some sites are still
24 in-progress.

25 Tied to that is a collateral duty analysis

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1 from NEI 10-05, which was what was endorsed for use
2 during rulemaking, when we had to reestablish the
3 baseline EP staff in the E Plan, the licensee basis.

4 So, what we are doing is looking into the
5 first six hours of minimum staff only and evaluating
6 whether they can implement all of the required Phase
7 I, Phase II mitigating strategies and also making sure
8 that they can provide command and control for
9 classification, notification, protective action
10 recommendations and STA communications for the NRC,
11 state, and local. Those are all functions that have
12 to be able to be performed concurrently as part of that
13 and 10-05 provides a framework for performing that
14 collateral duty analysis.

15 Just to amplify a little bit on the
16 post-six-hour question. At six hours, if you
17 completed all of the required actions to power up your
18 chargers, to establish a pump and injection flow path,
19 and you have done debris removal, you are at a point
20 there now you will have some people tied up. You will
21 have someone tied up to refuel diesels. You will have
22 someone tied up for that.

23 You will have people tied up to monitor the
24 generators and pumps but you will have resources out
25 of the MIN staff, or likely will have resources

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1 available out of the MIN staff, at that point, who are
2 available to continue to perform plant actions. That
3 is what we have seen at Exelon, certainly, in our
4 assessments.

5 So, I don't want it to appear that at six
6 hours your MIN staff is still tied up performing those
7 actions and no one is available on-site and the only
8 people you have to implement, say the actions in 13-02,
9 would be the people who are brought in via helicopter
10 or military vehicle or whatever limited means you have
11 to transport them. There will likely be, at least in
12 all of the assessments we have done at Exelon, there
13 are resources available from the onsite MIN staff at
14 that point, to continue to perform operating
15 activities.

16 CONSULTANT SHACK: Do you do this in
17 conjunction with the Appendix E evaluations in 12-06,
18 where you are doing the validation that sort of
19 indicates that you can really do all this stuff in the
20 time required?

21 MR. DRIEHAUS: So what we have done, since
22 the assessments have to be done four months prior to
23 the outage, we are going back as we do validation. At
24 least for Exelon, we actually put a statement in our
25 submittal that we are going to go and look at the

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1 validation results.

2 CONSULTANT SHACK: Okay, so there is a
3 connection between them.

4 MR. DRIEHAUS: If they change the staffing
5 requirements, we are going to provide them our
6 implementation letter.

7 MR. YOUNG: So if you made the assumption
8 that X task took one hour and then you get the validation
9 data, you will go back and look. And if it is less than
10 one hour, you are good but if it is more, you may have
11 to tweak.

12 MR. DRIEHAUS: Yes and there is some, for
13 most of the staffing assessments, because in a lot of
14 cases we didn't even have the equipment on-site at the
15 time, you have to make your best assumption. And once
16 you have the validation information to feed in, you can
17 look at what you have got in your assessment. And
18 typically, times will lengthen, sometimes may go up --

19 CONSULTANT SHACK: It would just seem to
20 be strange that 12-01 didn't make any reference to
21 Appendix E.

22 MR. YOUNG: Well, when 12-01 was written,
23 12-06 didn't exist.

24 CONSULTANT SHACK: That's true.

25 MR. YOUNG: So, we were the first one out

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1 of the starting gate.

2 MR. DRIEHAUS: But we are tying the
3 validation results to revisiting those assumptions
4 with the first FLEX implementation at a site.

5 CHAIRMAN SCHULTZ: And we would encourage
6 you to follow that feedback loop to assure that what
7 you have done is where you think it ought to be and where
8 it should be going forward.

9 I did want to -- the way it was presented,
10 Paul, I just wanted to have you emphasize that this is
11 an augmentation. It is not a new program plan but a
12 re-look at staffing requirements because of new
13 capabilities, FLEX capabilities in particular, that is
14 being reexamined and rebuilt but there is a strong
15 baseline based upon our emergency response
16 capabilities that we have had in place.

17 MR. DRIEHAUS: Yes, I think that is an
18 accurate characterization. You know we are, in some
19 cases, relying on some security force members to
20 augment those responses during that first six hours.
21 That has typically been limited and certainly not at
22 all sites. But that has also been an option for
23 typically a short period of time during those six hours.
24 And those would typically be to perform some -- to
25 assist with some manual labor.

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1 MR. YOUNG: Yes, we are starting with a
2 very robust augmentation --

3 MR. DRIEHAUS: Absolutely.

4 MR. YOUNG: -- feasibility to start with
5 just from all the existing requirements and guidance
6 that have been out there for a long time plus the NEI
7 10-05 staffing analyses that were done for the EP rule
8 compliance. And then this is like an extra layer,
9 looking at some additional tasks.

10 CHAIRMAN SCHULTZ: We have the new FLEX
11 capabilities.

12 MR. DRIEHAUS: Correct.

13 CHAIRMAN SCHULTZ: And that requires a
14 different kind of look and capability and new training
15 associated with it. Are there sets of drills or
16 tabletop exercises that are associated with FLEX
17 implementation that have been incorporated as you are
18 seeing it?

19 MR. DRIEHAUS: So, when we are doing our
20 staffing assessment, we are doing it in a tabletop and
21 we will start at T-zero and we will walk through, based
22 on the procedures existing at the time. And I haven't
23 been privy to the development of the operator training
24 to date but my understanding is that the operator
25 training is also going to involve physically going out

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1 and performing the tasks. We are going to be doing some
2 operator training on the command and control aspects
3 as well.

4 As far as integrating that, that is, I
5 think the drills are really the end result of
6 integrating all of those pieces.

7 CHAIRMAN SCHULTZ: Well, I was
8 remembering back to some discussions we have had about
9 how the process works in terms of determination of
10 equipment needs, communications of those needs, and
11 then follow-up evaluation associated with that
12 process. And I would think that that would lead to a
13 good opportunity for tabletop exercises to assure that
14 people know what their roles and responsibilities are
15 in that overall process and can exercise them rapidly,
16 without thinking, in particular, about what they may
17 or may not know at the time.

18 Any other discussion on this topic? This
19 is the last opportunity we have with this panel.
20 Hearing no other comments or explanation or questions,
21 we will move to the staff recommendations.

22 CHAIRMAN SCHULTZ: Welcome.

23 MR. MURRAY: Thank you. Good morning.
24 I'm Milt Murray and I am an emergency preparedness
25 specialist for the Office of the Nuclear Security

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1 Incident Response. I have been with the Agency since
2 2008 and prior to that I was in nuclear power,
3 commercial nuclear power for many years.

4 CHAIRMAN SCHULTZ: Is your mike on? I'm
5 just checking to see if your microphone is on. Is the
6 green light on? Hit the green light. Hit the button
7 on top -- on the bottom. I'm sorry.

8 MR. MURRAY: Tim Kolb, I will let him
9 introduce himself.

10 MR. KOLB: Good morning. My name is Tim
11 Kolb I am in the Operator Licensee and Training Branch
12 in the NRR. I have been with the NRC since 2001. And
13 previous to that, I have been a licensed SRO1 shift as
14 a shift manager for a period of time also. So, that
15 is my background.

16 MR. MURRAY: This morning, we are going to
17 be discussing Draft Reg Guide DG-1319, which is an
18 integrated response capabilities for beyond design
19 basis events. I will be providing the discussion
20 points on a couple of the documents, NEI 12-01 and NEI
21 13-06. And Tim will lead the discussion on 14-01.

22 The guidance currently is in a draft from
23 and the plan, the final guidance to be completed and
24 published in conjunction with the proposed rule later
25 this year.

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1 We are looking at endorsing the three NEI
2 documents, the three you just heard about in this DG,
3 NEI 12-01, NEI 13-60 and NEI 14-01 with some
4 clarifications noted in 14-01.

5 NEI 12-01, as you heard previously, was
6 endorsed by the NRC. It was prepared in response to
7 the March 12, 2012 RFI letter that was sent to industry
8 requesting information on staffing and the
9 communications required for responding to a beyond
10 design basis event.

11 Currently, 12-01, there is no requirement
12 for reassessment and communications as part of the
13 current rulemaking -- the proposed rulemaking.

14 The staff's position on 12-01 is we find
15 that it provides an acceptable method to assess
16 accident response staffing in order to meet the
17 requirements of the rule and it also provides an
18 acceptable method to assess communications
19 capabilities related to the rule.

20 Staffing assessments were performed in the
21 two-phase approach. As you heard Phase I they were
22 completed April 2013, based on the pre-FLEX strategies,
23 basically kind of dealing with the SBO-type events.

24 The Phase II staffing assessments, we
25 have, I think, maybe a dozen that have been completed

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1 so far and we have got maybe 20 some that are in process
2 right now and the review process.

3 Communications, all of the communications
4 assessments have been completed and there is no
5 requirement to go back and do that as part of the --
6 to reassess communications as part of the rule.

7 That was it on 12-01, if no questions.

8 CONSULTANT SHACK: Is everybody, in their
9 plans, providing a tie-back to the Appendix E or the
10 12-06 for the validation?

11 MR. MURRAY: To my knowledge, the majority
12 of the plans we have reviewed so far to that level, yes.
13 Once it is validated, they go back to look at it. If
14 it has no impact on the plan, then they owe us nothing.
15 If it does impact what they have provided to us, then
16 they will resubmit that.

17 CONSULTANT SHACK: That is the majority.

18 MR. MURRAY: Right. Like I said, the ones
19 we were -- we have got about 20 some that are in the
20 pipeline. So, we haven't completed all of them yet but
21 that is something we are looking for is that tie-back.

22 Moving on to 13-06, which is the
23 enhancements to emergency response capabilities for
24 beyond design basis events and severe accidents, again,
25 the staff's position here is that 13-06 provides an

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1 acceptable method to meet the emergency facilities and
2 equipment requirements. Also, on this side here,
3 acceptable method to meet the assessment requirements
4 for multi-unit dose assessment.

5 Okay, recommended actions in the document.
6 to support that staff position, implement any of the
7 facility enhancements identified in the communications
8 and staffing assessments, which we said the
9 communications assessments are completed and the
10 staffing assessments are ongoing.

11 To ensure that sufficient quantities of
12 radiation, protective equipment and supplies are
13 available to support the extended response effort for
14 the augmented ERO to an event of this magnitude; ensure
15 that programmatic controls are in place to ensure
16 facility, equipment, and supplies are maintained in a
17 state of readiness. And as you heard earlier, the
18 contracts were things like just support to move the
19 staff to ERO, to make sure that any supporting contracts
20 are periodically reviewed.

21 The multi-unit dose assessment, as you
22 heard there, with the exception of I think it was three
23 facilities, everyone was in compliance with that
24 capability as of December 31st of 2014. We have three
25 other sites that are working towards compliance and

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1 they should all be within compliance this year.

2 Again, 13-06 training drills and
3 exercises, we feel that the document provides an
4 acceptable method for meeting the training
5 requirements and the drill and exercise requirements
6 in 10 CFR 50.155, which is the proposed rule.

7 The training, going back to the document,
8 training requirements in the document are based on the
9 systems approach to training, as defined in 10 CFR 50.4,
10 which are the five elements there related to that.

11 Guidance in the document applies to all the
12 individuals that will be implementing any of the tasks
13 associated with this, not only licensed operators but
14 non-licensed operators, your HP staff, maintenance
15 staff, anyone involved.

16 The industry has a well-established
17 training program, like I said, based on the systematic
18 approach to training or the systems approach to
19 training.

20 There are several new knowledge and
21 abilities are added to the current KA catalogues that
22 address SAMGs. Those are knowledge of SAMG transition
23 criteria and the knowledge of lines of authority during
24 implementation SAMGs and some of the additional
25 recommended actions in the training section of 13-06.

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1 The programs should assess in trying to
2 implement ways to perform the task under the expected
3 adverse conditions, the more hands-on realistic
4 approach to the training versus you know tabletop is
5 good but trying to get better always learning from it,
6 especially when we have an event we can learn from. And
7 it also includes the position-specific qualifications
8 that we heard about earlier for the Ultimate Decision
9 Maker.

10 Drills and exercises demonstrates the
11 capability to effectively integrate the use of your
12 accident mitigation management procedures and
13 guideline sets. You heard earlier about that. And
14 that is one of the requirements or recommended actions
15 within the document to make sure that that happens.

16 And the guidance retains the current
17 exercise aspects, such as the use of the simulator to
18 the extent possible; demonstrates all the guidelines
19 set over the eight-year period; requires integrated use
20 with EOPs and provides for drill and exercise critiques
21 to be performed following these activities.

22 Additional recommendations in the
23 document, it includes more than just a transitioning
24 to an accident guidelines that you actually must
25 demonstrate selection and use of the appropriate

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1 strategy. Again, all the guideline sets must be
2 demonstrated at least every eight years. And as we
3 heard earlier, it is not part of the emergency
4 preparedness schedule but it can be included into that
5 by any exercise program. It can be part of the EP
6 program scenario or done on its own, if choosing. It
7 kind of gives the licensee flexibility there.

8 CHAIRMAN SCHULTZ: So with that
9 flexibility, in terms of the NRC's oversight of the
10 activities of each of the licensees, how is that
11 intended to be monitored and evaluated by the NRC staff?

12 In other words, it is good to provide that
13 flexibility and licensees have indicated they are
14 prepared to take advantage of that and they understand
15 that that flexibility is available to them but it does
16 create an issue -- could create an issue about how that
17 is going to be evaluated and monitored.

18 MR. MURRAY: It could. That is something
19 we are still working on on our end.

20 CHAIRMAN SCHULTZ: We hope it is not just
21 a checklist but a deeper evaluation associated with it.

22 MR. KOLB: Part of working that out is that
23 there is questions coming in like when we observe these
24 SAMG drills or EDMGs that could be a part of the license
25 examiners could help out or it could be a resident that

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1 actually monitors these exercises and drills and
2 ensures that they are following the NEI guidance, as
3 far as how it is played out to ensure that transitions
4 are observed and they actually use the strategies.

5 So, we are trying to get that put into place
6 as far as the actual inspection guidance on how to
7 monitor that. But we foresee having experienced
8 examiners or regional training for the resident
9 inspectors to monitor those exercises and drills.

10 MEMBER RAY: Well, I think that gets to
11 what I was talking about because at the end of the day,
12 there is an impact here which people are going to
13 address in different ways and that is understandable.
14 There is flexibility, as you say. Certainly this isn't
15 the same thing as licensed operator training. It
16 extends way out to a lot of people involved.

17 And typically in emergency planning, of
18 course, it is an observed event by the NRC. This is
19 something new and finding out how it is going to be
20 assessed and, therefore, how it will impact other
21 things that are going on at the plant. It is something
22 that I think we need to monitor, Steve, or do something
23 to follow-up on. Otherwise, I think it is something
24 that is premature to expect details on now but it is
25 not unimportant and so we can just disregard it.

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1 CHAIRMAN SCHULTZ: I agree, Harold.

2 MR. MURRAY: Okay, we'll take that also.

3 Okay, next up is 14-01.

4 MR. KOLB: Okay, for NEI 14-01, this
5 section really, in the NEI Guidance Document, talks
6 about the procedure integration as far as the 10 CFR
7 50.155(b) (4). So, it addresses those requirements in
8 Section 4 and the NRC is endorsing that process.

9 The main reason is it does have the
10 appropriate transitions from as far as integrated
11 response for procedure integration, they will have to
12 demonstrate it through exercises and drills. They do
13 have programmatic controls, guidance in the documents
14 to monitor that procedure integration. So, we have
15 looked at -- through their access to the portals that
16 the industry has let us look at, we have looked at some
17 of their SAMGs and how they transition from EOPs to
18 SAMGs. We have had a look at that and it looks
19 reasonable.

20 So, and their guidance, obviously has
21 guidance that says EOPs and guidelines said the
22 transition stuff is clearly identified. So, we think
23 that guidance is appropriate.

24 As far as fire response procedures, the
25 staff feels that we still don't need to include those

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1 in the integrated response. The overall integrated
2 response, we feel, is the part that 50.155(b), which
3 covers the emergency procedures like the SAMGs, FLEX,
4 and EDMGs and it also, for (b) (4) it talks about the
5 integrated EOPs for those. And it also, for the
6 overall integration, talks about that you have to have
7 the appropriate staffing for (b) (5). And for (b) (6),
8 in talks about having the command and control
9 structure.

10 So, that overall integrated function is
11 covered by those six sections in 50.155(b).

12 As far as fire protection being integrated
13 into this response capability, there is many reasons
14 why we feel it doesn't belong in there, mainly, and some
15 of them we mentioned in the SOC, you could at least have
16 a dedicated fire brigade. They are manned around the
17 clock, 24 hours a day. The fire response, typically,
18 once the fire brigade is dispatched and figures where
19 it is at and what equipment is affected, they actually,
20 the brigade leader is the one that directs how to put
21 that fire out. His knowledgeable. He is a
22 knowledgeable person that would let the control room
23 know if it is going to affect certain equipment,
24 safety-related or effect the shutdown capability of the
25 plant.

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1 They are required, the brigade does
2 maintain communications by radio with the control room.
3 So, the control room is up to speed on what they are
4 doing and how they are progressing. They are able to
5 EOP or EAL calls based on what the fire brigade is seeing
6 or if they can't get the fire out in a certain amount
7 of time, that is an activity, an EAL entry.

8 Other reasons is the EOPs and guidelines,
9 they also address failure of equipment. So fires, if
10 you don't put them out, obviously, some equipment is
11 going to fail. So, the EOPs and other sets account for
12 the failure of that equipment. And it may be you will
13 have to implement another strategy but that is one of
14 the reasons.

15 The fire drills, really, they are
16 conducted regularly, typically quarterly. There are
17 unannounced drills. There are announced drills.
18 They try to implement realistic conditions sometimes
19 like their training is involved that they have prior
20 training where they have smoke in the area. So, they
21 get trained on aspects they would see during a real
22 fire.

23 So, that is the reason why we think it would
24 be difficult to implement that type of strategies into
25 an overall integrated process to account for all of

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1 those different conditions and things that could happen
2 during a fire. So, the staff feels it is appropriate
3 not to integrate it into those procedure sets at this
4 time.

5 MEMBER BLEY: Tim, before you go on, I am
6 not going to rehash the discussion we had this morning
7 except to say, as you heard from the industry,
8 procedure, fire procedure a little different as you go
9 plant to plant. Most plants that have had a big fire
10 and significant event have pulled a guy off the boards
11 to sit on the phones with the fire brigade. So, it
12 affects the control room in more than just the ways you
13 described. You heard what we had to say.

14 MR. KOLB: And that is true, however, the
15 guy in charge in the control room is aware of that person
16 being I wouldn't say sidelined but cognizant of where
17 the fire brigade is at under those conditions. And you
18 know if the control room supervisor needs to use that
19 guy for something else, he could, obviously, do that,
20 as long as they maintain control but he can make that
21 decision.

22 MEMBER BLEY: Well, despite what is
23 obvious, I would make the same recommendation to you
24 I did to the other fellows. Look at all the fire events
25 and all the analyses of those and all of the inspection

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1 reports on them. There is at least four or five that
2 you will find very interesting.

3 CHAIRMAN SCHULTZ: And also, Tim,
4 understand that if there is the latitude for sites to
5 develop things a little bit differently here and a
6 little bit differently there, then that raises the
7 attention that the NRC needs to put on to assuring that
8 the decisions that are made on the selective basis site
9 to site are, in fact, the right one.

10 MR. KOLB: Okay, we will look at the fire
11 events in the past and see what could have been learned.
12 We'll take a look at that.

13 The next section is for SAMGs. NEI 14-01
14 Section 3.2.2 and 3.2.3, which are principles of SAMGs
15 and then the considerations for site-specific SAMGs we
16 believe provide an acceptable method to develop,
17 implement, and maintain SAMGs as required by
18 50.155(b) (3).

19 And the reasons why we believe that is
20 because the guidance supports the SAMGs will be updated
21 with the most recent version of the Owners' Group
22 Guidelines and the Technical Basis Documents.

23 Once again, we have had access to the
24 industry's SharePoint site and we have verified that
25 they have incorporated lessons learned from Fukushima.

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1 They have additional Canada high-level actions added
2 because of that. So, we think those were appropriate
3 from what we have seen.

4 Additional industry guidance, you know
5 symptom-based guidelines they have clear entry
6 conditions and transitions.

7 One other thing they do cover that they
8 will have clear command and control for who is running
9 these SAMGs, once they get into them. Typically, the
10 SAMGs will transition to the Technical Support Center,
11 when they get manned up. So, that is clearly
12 identified who is going to be responsible for taking
13 those actions.

14 So, that is some of the reasons why we
15 believe the Guidance Documents are adequate.

16 The next one, command and control.
17 Section 4 provides an acceptable method in combination
18 with the existing ERO command and control structure
19 guidance to meet the requirements of 10 CFR
20 50.155(b) (6). However, the guidance in NEI 14-01 is
21 principally limited to the discussion on what the
22 Ultimate Decision Maker does. So, we have provided
23 that feedback.

24 The reasons why we are endorsing this
25 document is the command and control structure is

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1 already existing through the emergency response
2 organization and this guidance does ensure that the
3 Ultimate Decision Maker position is factored into that
4 organization and they have ensured that they have clear
5 expectations of what it is. When you are the Ultimate
6 Decision Maker, you have to be qualified and trained.

7 Also the additional things for the
8 Ultimate Decision Maker, there will be support staff
9 helping that person make decisions. And I know you
10 discussed it with the industry quite a bit on how that
11 is going to happen and if they need a license and stuff.
12 That is currently not in there to have an SRO but we
13 believe that the people that are assisting that will
14 be part of the technical support staff or the emergency
15 response organization, they have those licensed
16 positions, somebody there to help them make decisions.
17 However, he is the Ultimate Decision Maker and will have
18 the authority to make those decisions.

19 Incidentally, that is in alignment with
20 the International Standards. They do that the same
21 way. They specify there needs to be an Ultimate
22 Decision Maker that ultimately makes the final
23 decision. And the guidance, you know really the
24 authorities and responsibilities are clearly defined
25 for that position and for really all the other emergency

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1 response organization positions.

2 So, once again, we feel that the guidance
3 is acceptable. And that is all I have, if you have
4 questions.

5 CONSULTANT SHACK: Steve, Dick Skillman
6 has been listening in. I think he would like to make
7 a comment, if it is open or we can open it up.

8 CHAIRMAN SCHULTZ: Do you know if he is on
9 the public line, Kathy?

10 MS. WEAVER: I'll have to look.

11 CHAIRMAN SCHULTZ: Go ahead. Dick, if
12 you are out there, and I presume you are, we are going
13 to open up the public line in a moment. So, be prepared
14 to make your comment or ask your question.

15 The line is open, Dick. Are you
16 available?

17 MEMBER SKILLMAN: Colleagues, staff, NEI,
18 good morning.

19 CHAIRMAN SCHULTZ: Dick Skillman, member
20 of the ACRS. Go ahead, Dick, please.

21 MEMBER SKILLMAN: I have been with you
22 every minute of the way. I tuned in at 0820, listened
23 to the pre-conversation and have been with you every
24 minute.

25 Thank you for this very thorough

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1 presentation. I have got several comments I would like
2 to make, if I may, please.

3 CHAIRMAN SCHULTZ: Proceed.

4 MEMBER SKILLMAN: Thank you. At 0927,
5 Phil Amway communicated that there is a clear exit from
6 the EOPs to the SAMGs. I believe it is on Phil's slide
7 8. I wanted to challenge the word exit. I wonder if
8 Phil meant suspend versus exit. Having been the
9 Ultimate Decision Maker, ED and ESD, I will tell you
10 that the movement from the EOP into the SAMG is not a
11 clearly defined transition and a Decision Maker may
12 want to hang on that line, just in case the conditions
13 allow reversal back into the EOP.

14 So my question is to Phil Amway. And that
15 is, do you mean exit, as in your slide, or do you mean
16 suspension until your next decision point?

17 CHAIRMAN SCHULTZ: Phil's at the
18 microphone, Dick. Hold on one moment for a response.

19 MEMBER SKILLMAN: Okay, thank you.

20 MR. AMWAY: Good morning. This is Phil
21 Amway and in response to the question being asked by
22 Dick Skillman, I did mean exit the EOPs. And the only
23 return path, at that particular point in time, would
24 be after event recovery, not necessarily just the next
25 decision maker.

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1 We would proceed on with strategies, as
2 defined in the SAMGs, with the intent not to go back
3 and forth between EOPs and SAMGs, once that decision
4 is made.

5 MEMBER SKILLMAN: Phil, thank you. I
6 understand your answer. I will presume, then, that
7 what you have expressed will be a matter of what Harold
8 Ray said, an issue of training and drilling, so that
9 there is no ambiguity in how that transition occurs.

10 MR. AMWAY: And this is Phil Amway, again,
11 responding. Yes, that would be made clear in the
12 training and drills and exercises, the transition
13 between EOPs and SAMGs.

14 MEMBER SKILLMAN: Okay, thank you, Phil.

15 The second question I have is for Walt. At
16 1038 on slide 15, you don't need to go back to this,
17 this is where Walt was talking kind of in a flow of
18 consciousness about transition of command and control.
19 And I would like to make a statement. And that is,
20 unless that transition in command and control is
21 rehearsed, and well-understood, and bought into --
22 rehearsed, well-understood and bought into, then the
23 scenario that Dennis Bley pointed to is very possible.
24 I don't say likely but it is possible. And that is
25 where a senior individual, whether it is an officer of

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1 the company or it is a very highly respected individual
2 can have disproportionate impact on the decision makers
3 in the heat of the moment. And that transition of who
4 is on watch and who has got the CON needs to be very
5 well endorsed; in other words, when you transition from
6 EOP to SAMG, who really is the Ultimate Decision Maker,
7 so at the point of the decision, the assembled group
8 doesn't go in to quibble.

9 I agree with what Phil said, this would be
10 a collegial decision. But I had two instances, one
11 during the TMI2 event and one during the Pierce Nye
12 event that brought you to New Jersey barriers in which
13 the region actually attempted to exert command and
14 control.

15 Now on top of an event that is emerging to
16 have other decision makers, who are, quite candidly,
17 very highly placed, creates a dynamic that the decision
18 makers simply don't need. So, my point is there needs
19 to be very clear understanding of who has relieved whom.

20 And I just offer those of you who have had
21 licenses or for those who have been on naval ships or
22 merchant ships, you understand very clearly when the
23 words I relieve you and I stand relieved are spoken.

24 My final comment was at 1121. Paul was
25 talking. Paul is from Exelon and he mentioned that in

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1 some of the scenarios, they actually will take security
2 personnel and use them as laborers. And I just want
3 to ask a question. Who has got the gun? Who is on the
4 watch for security? Does that transition somehow
5 cause the security function, which at that time might
6 be the most important time for security to be in place,
7 to deteriorate the defense that security is intended
8 to provide?

9 And with that, I will stop. I thank you
10 for taking my comments.

11 CHAIRMAN SCHULTZ: Thank you, Dick. We
12 appreciate your comments.

13 Other members of the committee, questions
14 for the staff?

15 With that, we are going to move from the
16 agenda a bit. We are going to close the meeting now
17 and reassemble at 12:45, which was the reassembly time,
18 and pick up on the next topic, which is NEI panel to
19 address that at the outset.

20 So, with that, I will close the meeting and
21 we will break for lunch.

22 (Whereupon, the proceedings went off the
23 record for a lunch break.)

24 CHAIRMAN SCHULTZ: I'll call the meeting
25 back to order and have us come back on the record as

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1 we begin the next topic, which is the industry's
2 document support Reg Guide 1301. That's NEI 12-06.
3 And I'll turn the discussion over to Scott Bauer from
4 NEI to begin the presentation from the industry.

5 MR. BAUER: Okay. Thank you, Mr. Schultz
6 and thanks to the ACRS members for this opportunity.

7 So we are going to talk to you today about
8 a few topics and where the status is on issuing Revision
9 1 to NEI 12-06. And then we'll talk a little bit about
10 the Draft Guide, one comment we have on that at this
11 point in time. But I'd like to start by answering a
12 question that Mr. Shack asked earlier about the
13 staffing analysis and the reevaluation of that when you
14 get to the validation stage or implement what's going
15 to be Appendix E of 12-06 and ask Bryan Ford from Entergy
16 and Mike Powell from Palo Verde to talk about what
17 they've done at that validation step.

18 MR. FORD: Yes, so when you get to the
19 validation step, what you end up doing is going through
20 and looking -- can you perform the activity, how long
21 does it take? And from that we have not had to really
22 change our staffing study so much as we've needed to
23 go back and improve what our plans were. We've either
24 had to go pre-stage additional hose so that the person
25 could do it in the timelines. We've in at least one

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1 case went and did more tornado missile analysis to make
2 it so that he had more water available. So we realize
3 that we have to stay within our staffing study or change
4 the staffing study, and that's part of what we're
5 validating.

6 CONSULTANT SHACK: Yes. No, I mean
7 that's a fair approach.

8 MR. POWELL: And I'm Mike Powell. I'm the
9 Director of Fukushima Initiatives for Palo Verde. In
10 our case when we did the validation, we followed the
11 NEI Guidance, but we took it and did something
12 additional. We built a P6 schedule using the P6
13 scheduling tool. And allowed us to confirm that the
14 resources that we identified as being needed in the
15 staffing study were the right resources and that we
16 didn't need additional resources. It also helped us
17 to identify margins in our deployment. So we could not
18 actually assess that we had some extra hours of margin
19 in our strategies and our deployment than the staffing
20 study credited us for.

21 CONSULTANT SHACK: Yes. No, I guess
22 there will be some questions about margins when we get
23 to Appendix E.

24 MR. BAUER: Okay. So NEI 12-06, Rev. 0
25 was issued in August of 2013, and obviously the plants

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1 have been using that for two years during the
2 implementation phase, or almost two years. In the
3 course of that time a number of issues have come up with
4 implementation, so we've written like 30-plus
5 frequently asked question answers. We've resolved
6 more than a dozen what we call generic topics. I'd call
7 them generic issues, but the NRC already has a Generic
8 Issues Program, so generic topics that were identified.
9 And I'll talk a little bit about those issues. And now
10 with the development of the rulemaking, we've
11 essentially incorporated those frequently asked
12 questions and the generic topics into 12-06, Rev. 1,
13 in addition to some other changes that we made to
14 basically conform it to the rulemaking.

15 One of the big issues facing us right now
16 is what to implement or how to update this document to
17 deal with the reevaluated flood and seismic hazards.
18 So we have developed an Appendix G, or Appendix Golf
19 to the document that deals with the reevaluated flood
20 hazard that was submitted to the NRC a couple weeks ago
21 and is undergoing review. There's going to be a series
22 of public meetings in the next couple months to look
23 at that and then to come to agreement on the correct
24 content for this, how to deal with the reevaluated flood
25 hazard. The reevaluated seismic hazard is not

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1 anywhere near that level of completion. We're in
2 formative discussions just about how to even approach
3 the reevaluated seismic hazard. So that would
4 eventually be Appendix Hotel or H for the document.
5 And I'll talk about that some more.

6 So some of what I had just mentioned is on
7 this slide. The main objectives of the Revision 1 were
8 to conform it to the proposed rule, eliminate all the
9 references to the orders. And then one of the things
10 we found as we went through this two years of
11 implementation and as the plant's implemented we
12 noticed there were a number of issues that were being
13 identified by the NRC in their audits as alternatives.
14 Typically that occurred where people were putting FLEX
15 equipment in place, pre-staging it or installing it in
16 the plant. So we made some changes to the document to
17 basically allow for that.

18 And then I mentioned the generic topics.
19 Some of those were we have new guidance in there on the
20 shutdown modes, a new section that deals with how to
21 deploy FLEX or implement FLEX requirements for the
22 shutdown modes, battery calculations, now to do
23 extended battery calculations. One of the things that
24 was identified early on was in order to understand the
25 sequence of events for a FLEX event or an extended loss

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1 of AC power or loss of normal access to the ultimate
2 heat sink the plants need to run some sort of a code
3 to understand how the plant responded. So typically
4 they were running their thermal hydraulic codes, CENTS
5 for CE plants, NOTRUMP for Westinghouse. So we got
6 into an issue of, well, are those right applications?
7 Can they be useful as applications?

8 So we ended up going through some
9 interchange with the staff on how to properly endorse
10 the use of those codes for those cases. So we ended
11 up writing typically an owner's group white paper, and
12 then the staff endorsed that through some document. So
13 all of those documents are now listed in a new table
14 that's in the Section 3.2.1.13 of the document.

15 Maintenance. One of the questions we'll
16 talk about I'm sure in this session is the maintenance
17 rule application. We have pretty much stayed the
18 course on maintenance rule with regard to maintenance
19 rule is not applicable to B5B equipment or EDMG
20 equipment, or SAMGs. So there was a public meeting
21 April 19th, I think, to basically agree to a path
22 forward to accept the FLEX equipment from the
23 maintenance rule.

24 But what we had done was we developed a
25 maintenance guide under EPRI's cognizance, and that was

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1 reviewed by the staff and approved. And so that's
2 listed in this topical list of things that have been
3 -- the generic topics that have been dealt with. And
4 then we're using maintenance templates prepared by EPRI
5 for all of the different equipment to make sure we have
6 a consistent process for doing maintenance and
7 demonstrate the reliability and availability of the
8 equipment.

9 And then there's a number of entries in
10 this table for reactor coolant pump seal leakage
11 issues, some Westinghouse original seal issues, shield
12 seals, Flowserve seals. So there's a number of
13 resolutions that have been developed about how to deal
14 with seal leakage during the sequence of the ELAP event.
15 And so we put those resolutions into this table. It's
16 really just kind of a reference table. So it just lists
17 the PWROG topical, for example, and then the ML number
18 of the document that endorsed that. And we do foresee
19 adding an entry to that table to deal with the
20 maintenance rule.

21 So we submitted a proposed revision,
22 NUMARC 93-01 for NRC endorsement. And that's being
23 evaluated. They're going to revise a Reg Guide, so
24 it's probably going to take two years for that to
25 happen. But in the near term something is going to be

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1 posted into ADAMS agreeing essentially that FLEX
2 equipment is accepted from a maintenance rule and we'll
3 endorse that, or we'll list that endorsement
4 in --

5 CONSULTANT SHACK: On that table where you
6 see openings with no entry for like an ML number, that
7 means it's still an open issue?

8 MR. BAUER: Yes, sir.

9 CONSULTANT SHACK: Okay. And that's up
10 to the Rev. 1C version that we have. That's the most
11 recent?

12 MR. BAUER: No, it was actually Delta.
13 And how there's a version that we're working on that
14 -- what I call the final. Appendix G, Appendix H, the
15 reactor coolant pump seals and NOTRUMP code are the
16 things that we're lacking to basically say 12-06 Rev.
17 1 is done.

18 CONSULTANT SHACK: That's sort of the big
19 gaps that I see in there.

20 MR. BAUER: Yes. So since that revision
21 there's been a number of people who wrote topicals on
22 the reactor coolant pump seal issues. There's a PWROG
23 topical on the NOTRUMP issue and we're just waiting for
24 NRC endorsement of those documents.

25 CHAIRMAN SCHULTZ: Given what you've just

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1 said, Scott, you're still comfortable that you can
2 state that changes have in fact been presented in public
3 meetings? That is, you just described a number of
4 things that are --

5 MR. BAUER: Right. So we've had three
6 public meetings.

7 CHAIRMAN SCHULTZ: -- happening on the
8 fly.

9 MR. BAUER: Yes, we've had three public
10 meetings where we've gone sequentially through all of
11 these changes.

12 CHAIRMAN SCHULTZ: Right, the last one
13 being the middle of April.

14 MR. BAUER: And I've been keeping track in
15 a table of everything that we've addressed in the public
16 meeting and what the delta is. And we're talking now
17 about having another public meeting probably
18 mid/late-May to basically come to a final -- basically
19 say here's what we have.

20 CHAIRMAN SCHULTZ: That's really what I
21 wanted to hear. That sounds fine.

22 MR. BAUER: Yes.

23 CHAIRMAN SCHULTZ: Thank you.

24 MR. BAUER: Yes. And that public meeting
25 would also deal with probably the first round of

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1 questions on Appendix G for reevaluating flood hazards.
2 So we're probably going to put all that into one public
3 meeting.

4 The other changes we made is we've added
5 the validation guidance that we had developed for the
6 industry to use, and we've added that as Appendix Echo
7 to the document. And then; and I'll talk about this
8 more in a few seconds here, about Appendix Foxtrot was
9 the guidance for how to apply the document to an AP-1000
10 plant.

11 What we originally did there was -- I'm
12 really giving the whole presentation here on one side.
13 What we originally did there was we went to Appendix
14 Foxtrot and said, well, how do we make this generic for
15 any new design? So we originally went in and
16 genericized it. We basically pulled all the
17 AP-1000-specific stuff out, tried to make it a generic
18 appendix for new designs. And then in one of the public
19 meetings we were asked to revert it back to the
20 AP-1000-specific. And that's why Appendix Alpha of
21 the DG has been developed. The NRO staff wanted to
22 develop their own guidance. So that just hit the
23 street. It's -- and we were --

24 CONSULTANT SHACK: But somewhere it says
25 you're going to incorporate that when it's eventually

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1 done.

2 MR. BAUER: That would be the goal. So --

3 (Simultaneous speaking)

4 CONSULTANT SHACK: -- whether that will --

5 MR. BAUER: Yes. I'll talk more when I
6 get to the slide I'm at. I've probably given the whole
7 presentation here in --

8 CHAIRMAN SCHULTZ: Let's hold on that, but
9 we're very interested.

10 MR. BAUER: Yes.

11 CHAIRMAN SCHULTZ: Go ahead.

12 MR. BAUER: I understand. So here's the
13 remaining issues to deal with. The generic questions
14 on reactor coolant pump seals and NOTRUMP code,
15 maintenance rule resolution, and Appendix G and H. So
16 that's really what we have left to do to basically
17 declare 12-06 Rev. 1 done.

18 Let me say one other thing on that, though.
19 So 12-06 has -- if there's 100 changes in there, 5 of
20 them deal with a rule change and 95 of them deal with
21 the stuff we put into it to address things we've
22 identified in the last 2 years of experience with the
23 document. So one of the things we're talking about
24 with the staff is trying to proceed with an earlier
25 revision getting issued with those 95 changes and then

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1 separate out the 5 that need to go along with the
2 rulemaking package, mainly to give the plants that are
3 implementing this year and the ones that implement in
4 '16 the benefit of having all that guidance that is
5 currently FAQs and white papers and stuff, have it all
6 assembled in one location for them to benefit from that.
7 So I think if we end up moving forward in a shorter time
8 frame to put Appendix G into the document, that would
9 be the time that we would try to incorporate all these
10 other changes without the rulemaking ones.

11 So Appendix G, I'll just give you a brief
12 -- I think we've talked to you before about this, but
13 it gives four paths for mitigation of a reevaluated
14 flood hazard. Go to the next slide and we can look at
15 it, because you've seen this picture. So one is use
16 FLEX as is. One is to modify FLEX for any new
17 conditions that exist. The third is to use an
18 alternate mitigating strategy. In this case we
19 basically start with -- instead of starting with an
20 extended loss of AC power and loss of normal access to
21 the ultimate heat sink, you start with the reevaluated
22 flood hazard and you say what conditions does it create
23 at my plant, and then start with that set of
24 consequences to develop the mitigating strategy. And
25 then the fourth is the targeted hazard mitigating

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1 strategy for cases where the flood is significant and
2 you may need to do something out of the normal or open
3 containment hatches and let the flood go in, that type
4 of thing. And the Appendix G was submitted to the NRC
5 on April 27th for their review.

6 Okay. Draft Reg Guide. Like I said, we
7 have one issue with the Draft Reg Guide. Eric and I
8 have talked about this. I'm pretty sure we're on the
9 same page on this issue. But in the 12-06 original
10 document we did -- so an extended loss of AC power is
11 defined as loss of all your AC sources with the
12 exception that you still have the AC power that comes
13 from buses that are fed by station batteries through
14 inverters. So we call that vital AC instrument power.
15 So that power is still available at the beginning of
16 the event. The way the Reg Guide, or the Draft Guide
17 got written, it would appear that that is not the case,
18 and that would be a significant change to the rule, the
19 rules that everybody built FLEX off of.

20 So there are provisions, however -- and I
21 think this is where the difference lies, there are
22 provisions in 12-06 for dealing with some issues
23 associated with loss of vital AC instrument power. For
24 example, we do have the remote capability to manually
25 and remotely start the turbine-driven aux feedwater

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1 pump, RCIC pumps, or isolation condensers. And also,
2 we have a provision in there for being able to read
3 instruments locally near a containment penetration.
4 So there are provisions in there if you were to lose
5 instrument power, but we do not assume a loss of that
6 instrument power at time zero in the event. And we did
7 not analyze the event with that as an assumption. So
8 we just need to make sure the Draft Guide doesn't imply
9 that that is a starting condition.

10 CONSULTANT SHACK: The Draft Guide talks
11 about contingencies, which is not a word that you find
12 anywhere in 12-06. Maybe it's a question for the
13 staff, what they mean by "contingent." I mean, you
14 talk about your baseline capability. Then in the table
15 you indicate that you can in fact start these things
16 manually, which gives you a different capability,
17 really. And yet you never take any credit for that.
18 And I assume that you're not going to do any validation
19 that you can actually do the black start. Is that what
20 you're trying to avoid?

21 MR. BAUER: No. No, I think -- and I'll
22 let the plant guys in the room talk about this a little
23 bit more because they'll know better than I do, but most
24 of us are required to have that black start capability
25 for those pumps or condensers of whatever already. So

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1 we already validate that we can do that.

2 MR. FORD: Okay. Well, everybody went as
3 part of B5B -- from a boiler that one of the things we
4 did was make sure that RCIC could be run without DC
5 power. And I know that they have something similar for
6 their turbine-driven system.

7 MR. POWELL: Yes, we've actually
8 demonstrated the manual operation of the turbine-drive
9 aux feed pump without DC power. And we've taken a video
10 of it; use it in a training exercise. Manual operation
11 of the atmospheric dump valves in the turbine-drive aux
12 feed pump is a job performance measure that's repeated
13 at a certain frequency for the auxiliary operators, at
14 least at Palo Verde.

15 MR. BAUER: So we're really taking credit
16 for something that we already have in place on that.
17 Being able to read the instruments at or near a
18 containment penetration is some new capability that the
19 plants have had to develop as part of this
20 implementation of FLEX. And that was evaluated as part
21 of the audits the NRC did, as well as the ERRVs that
22 INPO did. They looked at that issue.

23 MR. FORD: But we haven't necessarily
24 built our staffing plans for that we have to go
25 reconfigure these instruments --

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1 MR. BAUER: Right.

2 MR. FORD: -- to use them versus the
3 instrument we're crediting.

4 CONSULTANT SHACK: So there's what we call
5 the stylized scenario that we built the FLEX strategies
6 to deal with, or mitigating strategies to deal with.
7 And then there were other things we stuck in the tool
8 box to basically say, hey, if this happens, you have
9 this capability. If this happens, you have this
10 capability. So we did add some other things.

11 CONSULTANT SHACK: Is there any reason to
12 believe that the inverters are any more robust than the
13 other equipment you assume is going to be lost if one
14 of these scenarios? I mean, is there a particular
15 reason why you picked a scenario where you would lose
16 all of the AC except the inverters?

17 MR. FORD: Well, and I guess because the
18 inverters are coming off the batteries themselves.
19 That's the real issue.

20 CONSULTANT SHACK: But the equipment
21 itself --

22 MR. FORD: Shake it around.

23 CONSULTANT SHACK: -- shake it -- yes, for
24 beyond the design basis event that you assume you're
25 losing lots of other stuff. Why not the inverters?

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1 MR. BAUER: Yes, there's a lot of --

2 CONSULTANT SHACK: Okay. There's no
3 rationale.

4 MR. BAUER: Well, there's a lot of things
5 in the document. We assumed all the -- the switch gear
6 is still available even though you lost AC sources. So
7 again, the initial conditions or boundary conditions
8 are established, were established because
9 -- somewhat around this is what we could mitigate
10 without significant -- in the time frame we've got to
11 deal with to give us the capability of how a loss of
12 power and a loss of flow -- and we can provide strategies
13 to provide flow and provide power. I mean, if a large
14 wall of water went through our plants, we couldn't deal
15 with it probably any better than Fukushima deal with
16 it.

17 So there were limits of what we could do
18 under the FLEX strategies, and we realized going
19 forward we would -- we evaluated -- I know that we
20 evaluated flood and seismic hazard. And now under the
21 plants that we did the ESEP -- expedited seismic
22 evaluation? Enhanced seismic evaluation? But to
23 basically look at double the SSE capability for the
24 components used in the FLEX strategies. So we have
25 done that one piece for the seismic piece for the plants

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1 that screened into that.

2 But, yes, the starting conditions were
3 what they were. That's what we all agreed to at the
4 beginning.

5 MR. FORD: So that answers part of your
6 question, is that we have went and looked for the plants
7 that weren't able to screen out for the seismic hazard.
8 We have went and looked at two times the SSE for
9 robustness of the plant equipment that we're crediting
10 to support our FLEX strategy, a subset of equipment.
11 There was a cap put on it when we started the ESEP
12 because we're trying to do too many things in parallel
13 to necessarily make everything fit together well. So
14 the ESEPs were started well before the GMRSS came out,
15 so they were capped at the time. So our interim thing
16 was done at --

17 (Simultaneous speaking)

18 MR. BAUER: Okay. Any other questions on
19 that subject?

20 MEMBER STETKAR: Yes, kind of. And I
21 don't know quite when to ask it because it's part of
22 this how all the pieces fit together question. I
23 understand, I think I understand the assumptions that
24 you've built into 12-06 and the strategies under 12-06.
25 If I then put my boiling water, BWR Mark I and II hat

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1 on and look over to NEI 13-02 for things like severe
2 accident water addition. I see guidance that says,
3 well, you can hook up your water addition source to an
4 existing plant system through valves that might be AC
5 motor-operated and normally closed, and that's okay
6 because you can assume that you have a minimum of six
7 hours available to get power back to those valves and
8 still have enough time to inject into the vessel at a
9 de-pressurized condition and save the containment.

10 My question to them, them being part of
11 you, is that -- well, you know -- and they assume you
12 don't have any turbine-driven RCIC pump at time t0,
13 which is physically possible. It might not work or it
14 might be out of service for maintenance when the event
15 occurs. So if these are flexible strategies, you
16 should be flexible for that.

17 My question is what is the philosophy here?
18 Is the philosophy that I give up on the core because
19 I don't have to have power available for those two
20 normally closed valves into the RHR system until six
21 hours? And then for six hours I've melted the core.

22 MR. FORD: I think we'll let Randy --

23 MEMBER STETKAR: We're going to phone a
24 friend here.

25 MR. FORD: Yes.

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1 (Laughter)

2 MEMBER STETKAR: I mean, I wanted to ask
3 it here because this is the front end of the process.
4 And I asked it in previous meeting we had kind of looking
5 back from the back end of the process.

6 MR. FORD: So let me answer the front end.
7 And I think that he can answer the second piece to it
8 better. The 12-06 or FLEX or mitigating set of
9 strategies supports containment, but only assuming
10 there is no core damage. So it has been designed with
11 its set of boundary conditions that it works within,
12 and that does not include getting to core damage.

13 Now, for those situations where you're
14 outside of those bounds, I think that that's being
15 looked at as part of the water management strategies
16 that we're working on. Is that right?

17 MR. BUNT: This is Randy Bunt with
18 Southern Nuclear in the BWR Owner's Group.

19 What we've done is we stylized a scenario,
20 because that's what was given to us in the order. That
21 stylized scenario -- and I know this isn't exactly the
22 way you want me to answer the question, but I'm trying
23 to work through the pieces here. It's stylized. And
24 we said if you weren't able to get it any sooner than
25 this time period, would you still be able to protect

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1 containment, because that's where we saw the order
2 criteria driving us.

3 Now, we agree that you need to do that as
4 quickly as possible. And likely you know you have an
5 injected water from time equals zero and you know your
6 long-term action is going to get connections between
7 those components to get the water in. You would
8 prioritize either getting the power back or going and
9 opening those valves before you lost accessibility to
10 containment. And that direction has been added to
11 13-02 to say do not put inherent delays in and you should
12 facilitate getting your water addition installed as
13 quickly as possible.

14 MEMBER STETKAR: I think what I'm; quite
15 honestly I mentioned this in the previous meeting,
16 concerned about is that people are making decisions
17 based on all of these pieces of guidance. So for
18 example, if I have a plant that's located on a fairly
19 -- I don't know if there are any of these examples, but
20 this is a Gedanken experiment. If I have a plant that's
21 located on a fairly broad flood plain and I decide to
22 locate my portable emergency generating equipment six
23 miles away up on a hill in a facility that I happen to
24 have that's robust enough against seismic events
25 because I know that I won't need it for at least six

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1 hours according to the venting strategy to save the
2 containment, that then imposes a functional physical
3 limit on my ability to actually get that equipment to
4 the point where it can power those valves and open then
5 to get water into the reactor vessel.

6 And if I'm an operator faced with those
7 conditions, I might be frustrated by that because
8 people have made decisions about where to locate the
9 equipment according to guidance for mitigating
10 flooding responses and they look at these different
11 timing criteria that come out of these different
12 guidances. Yes, I might want to get that equipment
13 there really fast, but if somebody has put it far enough
14 away under conditions where I have to go through about
15 12 feet of water to get it from point A to point B, I'm
16 going to have a problem.

17 MR. FORD: And you're pointing out one of
18 the things that we've struggled with when we've been
19 siting our buildings today for FLEX.

20 MEMBER STETKAR: Yes. No, that's --

21 MR. FORD: Because you have this range of
22 hazards --

23 MEMBER STETKAR: Yes.

24 MR. FORD: -- and each one of those hazards
25 could push you to put your buildings in a different

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1 location. Because you put it right up next to the
2 plant, well, now the event that affected your diesels
3 or whatever has a bigger chance of affecting it also.

4
5 MEMBER STETKAR: And your decisions are
6 based on considerations like that, which are nice
7 physical functional -- in the context of whatever -- the
8 guidance, the technical guidance. And in this
9 particular instance I read the save the containment
10 guidance as saying I don't need to worry about hooking
11 up that power supply for at least six -- I've got as
12 much as six hours available. It would be good if I
13 could get it at zero, but I can figure out where I'm
14 going to locate that equipment as long as I can
15 demonstrate that I can get it there within six hours.
16 And I can still save the containment.

17 MR. BAUER: The Mark I and Mark II plants
18 still have to comply with the EA-12-049 Order, so they
19 have to have the capability to use the vent to prevent
20 core damage. So I'm assuming they're going to have --

21 MEMBER STETKAR: But prevent core damage
22 presuming that RCIC is running. Presuming that RCIC
23 is running.

24 MR. BAUER: That is true.

25 MEMBER STETKAR: Okay.

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1 MR. FORD: And so when we go to implement
2 Phase 2 of the Vent Order and we have the additional
3 requirements for water strategies that we have to meet,
4 that will then add another set of timing and equipment
5 restrictions on me. And I don't know that I'll be able
6 to use my FLEX equipment to perform those functions or
7 not. It all depends upon my current setup.

8 MEMBER STETKAR: Let's talk about --

9 MR. FORD: So I have to look at the times.

10 MEMBER STETKAR: Let's talk about
11 something specific. You need a 500-gallon-a-minute
12 low-pressure pump to put water in to save the
13 containment. Initially 500 gallons. You can
14 throttle it back to 100 gallons or whatever. The
15 analyses that have been done for the representative
16 plant says I can save the containment even though I have
17 no injection starting at t0. No water going in at t0.
18 I can still save the containment as long as I vent the
19 wetwell, hook up water injection so that I've got water
20 going in to either the drywell or the reactor vessel;
21 and it's preferred to go into the reactor vessel for
22 a lot of reasons, but that my water addition flow path
23 can be through let's call it two normally closed series
24 motor-operated valves into the residual heat removal
25 system, which is a nice way of getting water in. And

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1 it's okay to do that even though they're normally closed
2 AC motor-operated valves because I don't need to get
3 power to those valves for at least six hours.

4 Now, that's all for saving the containment.

5 MEMBER CORRADINI: Can I ask a question?

6 MEMBER STETKAR: Under --

7 MEMBER CORRADINI: May I just clarify one
8 thing?

9 MEMBER STETKAR: Yes.

10 MEMBER CORRADINI: I thought Randy's
11 comment to you when you said this the first time was
12 is that from what we heard two or three weeks ago to
13 now there's been a change, I thought, in 13-02. I get
14 all these numbers mixed up in my head. That it's not
15 six hours necessarily. More it's soon as practical.
16 I thought that's what you said.

17 MR. BUNT: That's correct. That is in
18 13-01, Rev. 1. 13-02, Rev. 1.

19 MEMBER CORRADINI: So that's the only
20 thing I want to correct you, John, is I think Randy
21 indicated they tried to be responsive to our worry.

22 MR. BUNT: In Section 1, on page 5 or 6 or
23 so there's criteria that says -- there's a new paragraph
24 that talks about the series starts at t=0 and you should
25 be able to not create design elements or other features

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1 that create an undue burden and you should be able to
2 do it as quickly as practical. But the analysis gives
3 you a basis on where you can't get past and still protect
4 it. So it's our stake in the ground where you don't
5 want to go further than and we want you to take into
6 consideration when you're doing your design and all
7 that you consider when you're putting it in the right
8 location and you're balancing all the different
9 consequences that you pick consequences that give you
10 the best solution path.

11 MEMBER STETKAR: Your Rev. 1 is dated
12 April 15, like the one that I read?

13 MR. BUNT: Yes.

14 MEMBER STETKAR: Okay.

15 MR. BUNT: Should be a --

16 MEMBER STETKAR: I read all of that.
17 That's all general good guidance, but if I'm thinking
18 about what I need to do is I need to make sure that I
19 can get the power within six hours. It doesn't say that
20 I need to get the power to save the core.

21 MR. BAUER: Right, so I think we need to
22 be careful here that we're talking two separate issues
23 here.

24 MEMBER STETKAR: But, see, that's my whole
25 point is that if this is diverse and flexible guidance

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1 to the operators under extreme conditions, in my
2 opinion, my personal opinion, it ought not be parsed
3 up this way, that we have this guidance for FLEX under
4 12-06 that has this set of assumptions built into it.
5 And then we have this set of guidance under 13-02 --

6 MEMBER CORRADINI: Rev. 1.

7 MEMBER STETKAR: -- Rev. 1 for saving the
8 containment that has this other set of assumptions
9 built into it, because the world might not work under
10 either sets of those assumptions, that there is some
11 likelihood, non-trivial measurable likelihood that
12 RCIC will not work at time t0. It's not guaranteed that
13 it won't work, but it's not guaranteed that it will
14 work.

15 MR. FORD: And I think that you're getting
16 that because the NRC and the industry has tried to do
17 things as expeditiously as possible. And as a result,
18 you're getting -- piece A is done while piece B is being
19 done three years now.

20 MEMBER STETKAR: Bryan, and I'm glad you
21 said that. I mean, that's what I'm getting to. And
22 unfortunately from my perspective as an ACRS member,
23 we've also received a lot of these indications kind of
24 piecemeal. And quite honestly, until I sat down and
25 read the six or seven current revisions of the NEI

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1 reports and started thinking about how they worked
2 together with one another, I hadn't necessarily drawn
3 those connections. So it's not clear to me who's tying
4 the stuff together.

5 I get with the fact certainly I would like
6 to get it as soon as possible, but if somebody has made
7 some actual physical decisions that means that the
8 quickest I can do it is within four hours, which is well
9 under the six-hour time window, but maybe not so good
10 for the core, because the guidance has been developed
11 under different sets of assumptions, that says, well,
12 maybe now we've gotten to the point where the guidance
13 is being actually really developed, both from the
14 industry's perspective and from the staff's
15 perspective. It's a time to start thinking about how
16 all those pieces really fit together, not just saying,
17 well, we developed this and we developed this and --

18 (Simultaneous speaking)

19 MEMBER BLEY: I don't think anybody
20 disagrees with the way you've gone to this point. I
21 don't know how else you'd do it.

22 MEMBER STETKAR: Right.

23 MEMBER BLEY: But it seems like we're at
24 a point where --

25 MEMBER STETKAR: To tie these together.

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1 That's right.

2 MEMBER BLEY: -- integration ought to mean
3 something.

4 MR. BUNT: And when we were writing 13-02,
5 we did work on a lot of that integration, because if
6 you look at 13-02, it leverages and builds on 12-06 and
7 utilizes some of those functionalities. But it says
8 you have to go the next step in saying that you can make
9 sure that you can do that function with a gap release
10 and events that can happen because of core damage. So
11 there was some intelligence that went in to integrate
12 them so that your operators wouldn't be training on two
13 different types of diesels. They wouldn't be training
14 on two different types of configurations. There was
15 a lot of work to determine if there could be some synergy
16 between the two so that from a training and everything
17 else sensitivity -- and we understand the other issue,
18 but it is a balancing act between where you put it to
19 address which hazard and not put so much equipment that
20 they have no capability to utilize the equipment
21 either.

22 MEMBER STETKAR: It is. And I'll tell you
23 that until I read 13-02, which has the -- and the revised
24 has a little softening up front, but it says, well,
25 specifically you don't need to get power to -- it's okay

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1 to have normally closed power-operated valves for which
2 a source of motor power is not available until six hours
3 after the initiating event. Until I read those words,
4 it didn't sort of trigger how all of the stuff fit
5 together. Because when I read 12-06, it all sounded
6 okay in the context of 12-06. You understand what I'm
7 saying?

8 MR. BAUER: Yes, the question I would ask
9 Randy is it would seem to me like the starting condition
10 of no RCIC available, six hours, is probably the
11 conditions under which you had to design the severe
12 accident capable event. It's not the defining the
13 sequence. It's the defining here's the conditions for
14 which you need to design this vent.

15 MEMBER STETKAR: That's the vent, but the
16 water -- it's not the vent. It's getting the water in.

17 MR. BAUER: Right. Okay.

18 MEMBER STETKAR: It's not getting the
19 steam out. It's getting the water in.

20 MR. BAUER: Yes.

21 MEMBER STETKAR: And in particular, in
22 that part it says --

23 MR. BAUER: It's not a water addition,
24 yes.

25 MEMBER STETKAR: -- that it's okay to hook

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1 it up to a flow path that has normally closed valves
2 that need some sort of -- some mode of power. Could
3 be AC power. Could be air or anything. But it would
4 typically be AC-powered valves. And that you don't
5 need that source of mode of power for -- it's you can
6 have up to six hours to get that for the most limiting
7 analysis for the representative plant that was done and
8 still have confidence that you can save the containment
9 in the sense that containment temperatures won't
10 exceed, whatever it is, 545 I think is the number.

11 MR. BUNT: Yes, so the containment stays
12 below its temperature limits --

13 MEMBER STETKAR: Right.

14 MR. BUNT: -- and that if you got the flow
15 at that time and you had the worst case or the most
16 limiting case analysis going forward, you would be
17 there. So there's a lot of variabilities that go into
18 that. And we did pick some values to build the cases
19 off of and also to leverage the information that we
20 already had for the 12-06 and the storage locations.
21 And the intent there was -- what we did with writing
22 that was to leverage the 12-01 guidance that you
23 mentioned before is that ERO staff starts showing up
24 at six hour and fully staffed at 24.

25 MEMBER STETKAR: Right. Yes.

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1 MR. BUNT: We credit extra people, but we
2 don't credit everybody there at six hours.

3 MEMBER STETKAR: Well, you credited
4 enough people to do whatever needs to be done to get
5 the pumps connected for the water addition and the power
6 supplies connected to get the valves open. So however
7 many bodies it takes to do that --

8 MR. BUNT: Correct, which is the same
9 assumptions that are there for FLEX and 12-06.

10 MEMBER STETKAR: It's by definition you
11 have all of the -- you have enough people to do whatever
12 needs to be done at six hours.

13 MR. BUNT: You have the right quantity,
14 the right skill set of people that short showing up
15 within six, and you're fully staffed at 24, which is
16 consistent with 12-01.

17 MEMBER STETKAR: Thanks.

18 MR. BAUER: Thanks, Randy. I think.
19 Okay. We ready to move on to Appendix Alpha?

20 MEMBER STETKAR: Yes. Oh, yes. Don't
21 look at me. I'm done. If I'm ranting, take that as
22 a indication to move on.

23 (Laughter)

24 MR. BAUER: Understand. Okay. I
25 already mentioned kind of the genesis of Appendix Alpha

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1 to DG-1301. Now we're not talking about 12-06. We had
2 the Appendix Foxtrot in 12-06 to deal with the AP-1000
3 plants, which the order applied to. We tried to make
4 that generic as the answer to deal with the new reactors
5 going forward. The other option we had looked at was
6 building an appendix for every different type of
7 design. And so, we opted to try to on a generic
8 approach. And then at one of the public meetings we
9 were asked by the staff to revert Appendix Foxtrot back
10 to AP-1000 only and that they were going to develop some
11 guidance for the new reactors. So that's the genesis
12 of Appendix Alpha.

13 Right now I really can't give you a read
14 on what we think of it. I looked at it myself. I said,
15 okay, the New Reactors Team at NEI and then the industry
16 really needs to take a look at this. So it's been
17 farmed out to them. We are starting to collect
18 comments. And I think the next step personally; and
19 I think this has been discussed with some of the new
20 reactors folks in the room, is to have a public meeting
21 to talk about Appendix Alpha and what the going forward
22 approach is.

23 When we do agree on the contents of
24 Appendix Alpha, or finalize that, then we would plan
25 to take that and incorporate it into 12-06 so that the

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1 Reg Guide could just endorse what's in 12-06. That
2 would be the plan.

3 So there's second slide on this, right?

4 So right now again, we're just in the
5 process of collecting comments on that. So at this
6 point I can't really give you any feedback.

7 CHAIRMAN SCHULTZ: So in this case; I
8 mean, it's interesting wording here, the intent is to
9 interact sufficiently with the staff so that you -- this
10 is a hoped-for result that you could incorporate it into
11 12-06 when comments are resolved at the same time that
12 the Reg Guide has been developed and published?

13 MR. BAUER: Yes.

14 CHAIRMAN SCHULTZ: The Draft Reg Guide has
15 been --

16 MR. BAUER: Yes, I mean, I --

17 CHAIRMAN SCHULTZ: But you're --

18 MR. BAUER: -- have full confidence we'll
19 get to a point where we'll agree on the content of this
20 and then move it over into 12-06. The other option
21 would be the industry would write their own guidance,
22 put it in 12-06 and then the Reg Guide if need be would
23 --

24 CHAIRMAN SCHULTZ: I only commented on it
25 that way because this is one area where it's good to

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1 know where things stand between the industry document
2 -- we knew that nothing was provided by industry here,
3 but we were not aware of what that meant in terms of
4 discussions that industry had had with the staff
5 related to this and where you were intending to go. So
6 this is helpful.

7 MR. BAUER: Yes, like I said, the existing
8 industry guys took a look at Appendix Alpha and says
9 this isn't our strong point here, so we need to farm
10 this off to the New Reactors Team at NEI. And so AREVA
11 and others are looking at this right now to say what
12 does this mean to us and what are our comments? We'd
13 like to engage with NRO staff in a public meeting to
14 work through the issues that are identified.

15 Next slide. The last topic I have to talk
16 about is this maintenance rule issue. Again, I think
17 I've told you most of this. The point is and the reason
18 for the April 19th public meeting was to meet with the
19 NRC staff to talk about an exception to the FLEX
20 equipment from the maintenance rule similar to what's
21 in there for SAMGs and EDMGs. And I think we've agreed
22 on a path forward on that.

23 Now the reason we can do that is because
24 we have developed in Section 11.5 of 12-06 a maintenance
25 program for the FLEX equipment that's based on this EPRI

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1 guidance document, which I mentioned was endorsed by
2 the staff and is listed in that table on 3.2.1.13 of
3 12-06. And we have EPRI maintenance templates that
4 we're using that have been developed specifically for
5 each type of equipment and are being implemented at the
6 plants.

7 I don't know if either of you want to talk
8 about the templates and where you are on those.

9 MR. POWELL: This is Mike Powell from Palo
10 Verde. We're just now implementing the templates.
11 We're starting to do our first round of maintenance.
12 Unit 1 was the first unit at Palo Verde. That was
13 implemented last fall. We just completed
14 implementation of the orders on Unit 2. So we're
15 starting to see our first round of maintenance
16 activities.

17 Similarly, the National SAFER Response
18 Centers who were declared operational and functional
19 last October, we're starting to complete our first
20 round of maintenance cycles and looking at what are the
21 lessons learned from doing the maintenance for the
22 first time using the templates. There's been several
23 industry phone calls where we've shared some of the
24 information. And we're keeping EPRI plugged in
25 through -- Marty Bridges is the contact at EPRI that

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1 we're relaying information to.

2 MR. BAUER: And I think when you're at Palo
3 Verde on the 19th I think you'll be able to see a lot
4 of this activity. You'll be talking to the people when
5 you go for the tour of the storage facility there that
6 actually do the maintenance on that, that maintain the
7 equipment.

8 CHAIRMAN SCHULTZ: But at this point,
9 Michael, what you're referring to is that you're
10 getting feedback as to how the templates are working
11 in their implementation?

12 MR. POWELL: That we may need to structure
13 items. And as we gain experience and time, we'll look
14 at can the frequencies for some of the maintenance be
15 extended? Is there a rational reason for doing that?
16 And we'll share that across the industry.

17 MEMBER RICCARDELLA: Mike, big picture
18 what is the difference between these templates and the
19 maintenance rule just from a 30,000-foot perspective?

20 MR. POWELL: The templates take credit for
21 the standby nature of the equipment. They factor in
22 what kind of environmental conditions the equipment may
23 see, so whether it's extreme heat in Arizona or extreme
24 cold in a northern state. How the equipment is stored.
25 It looks at how frequently how you -- say if we take

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1 a generator, how frequently should you hook it up to
2 a load bank and test it under load? Such simple things
3 as on the trailers and the equipment that have tires
4 how frequently you need to rotate the tires so you don't
5 get a memory in the tires, move the trailers in and out,
6 that sort of thing.

7 MR. FORD: This is Bryan Ford. Another
8 way to say it is that the EPRI templates tell you what
9 maintenance to do. While the maintenance rule is a
10 monitoring and risk assessment setup, it doesn't tell
11 you what maintenance to do. It tells you to balance
12 your maintenance and unavailability as you track and
13 control and take action based upon that. So in this
14 case we actually defined out the industry, here's the
15 maintenance you're going to do.

16 MR. POWELL: Better said, Bryan.

17 MR. FORD: Thank you.

18 MEMBER STETKAR: But you're describing
19 these templates are the maintenance procedures that I
20 would have for a turbine-driven aux feedwater pump.
21 Fine, I've got those. But the maintenance rule is
22 supposed to identify that that's a piece of equipment
23 important to safety, and therefore I must have
24 confidence that it's reliable and available, the
25 maintenance being part of that, the testing being

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1 another part of it. So trying to draw the analogy
2 between the templates that tell me what maintenance I
3 ought to do: make sure the tires are pumped up or make
4 sure that my turbine starts up when I want it to start
5 up is not really addressing the issue I thought that
6 Pete was looking for -- is what assurance to these
7 templates give that indeed the equipment will be
8 available and reliable, that somebody says, yes, we
9 ought to go kick the tires once every e months rather
10 than once every 16 years?

11 MR. BAUER: Right. So the document
12 that's referenced in 12-06 is a guidance document for
13 how these templates are developed. And that was
14 reviewed and endorsed by the staff. And then EPRI
15 developed these templates with industry committees
16 that basically took all the vendor documents and
17 developed the templates and provided them to the sites
18 so that we'd have consistent maintenance being done.
19 And so that's where the periodicity and what type of
20 maintenance and all that is decided in that maintenance
21 template.

22 MEMBER STETKAR: The templates have the
23 periodicity built in them?

24 CHAIRMAN SCHULTZ: It's a directive
25 maintenance program that's been developed.

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1 MEMBER STETKAR: Okay. I missed that I
2 think in part of the discussion.

3 MR. POWELL: One of the things to make note
4 of, when EPRI started developing the templates, they
5 would bring in like all the portable pump manufacturers
6 and have essentially what I would call an expert panel
7 and solicited industry feedback and said what's the
8 right frequency to change the oil? What's the right
9 frequency to test the pump? What soft parts -- what's
10 the frequency -- do we need to -- and all those
11 activities are specified in the templates.

12 MEMBER STETKAR: I personally am less
13 interested in the activities, because how I make sure
14 that a valve opens and closes, what I need to do to do
15 that, make sure the packing isn't too tight or something
16 like that, that the minutiae of making sure that the
17 things works. I'm interested more in the frequency at
18 which those activities are performed, functional
19 testing and preventive maintenance frequencies such
20 that I have assurance that when somebody goes out to
21 use it, it's actually there. I mean, if I'm doing all
22 of these good preventive maintenance things but only
23 doing them once every seven years, that may not provide
24 me very good assurance that it's going to be available.

25 So I'd be interested how EPRI came up with

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1 the periodicity of those different events considering
2 what may be plant-specific and site-specific needs for
3 the equipment itself.

4 MR. FORD: Well, as he was saying, they
5 gave us recommendations based upon the temperatures the
6 thing saw, the amount it was used. So they gave us a
7 range of frequencies based upon different service
8 conditions.

9 Now you can with technical justification
10 modify those, but basically using their expert panels
11 they've laid out the maintenance frequencies.

12 MEMBER STETKAR: Thanks.

13 MR. POWELL: When you all come to Palo
14 -- we can go through some plant-specific examples for
15 the equipment we have.

16 MEMBER STETKAR: That would be good, if
17 you had them, Mike.

18 MR. POWELL: We can do that.

19 MEMBER STETKAR: That would be good.

20 CHAIRMAN SCHULTZ: Is the process for
21 these -- for gaining an exception, is that laid out in
22 the guidance, in the template program process? I was
23 with you until you said, oh, and then exceptions can
24 be granted, or given, or determined by a licensee.

25 MR. FORD: I don't remember reading what

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1 the guidance says. I do know that we have changed one
2 frequency and they've put together an engineering
3 report that went through. Here's our basis for it and
4 the temperatures and here's what we consider the
5 impact. I don't remember what drove that.

6 MR. BUNT: This is Randy Bunt again. What
7 EPRI did in their structure was they used the PM
8 template structure they use for equipment reliability
9 and followed that same process to come up with the
10 expert panel to develop the right frequencies and the
11 right test patterns. You bring plant experience,
12 operating experience and manufacturer experience.
13 And then there's a formal process that most plants use;
14 I know at our plants we use it, that this PM process
15 will still go into that allows you to change or adjust
16 frequency based on specifics uniquenesses about your
17 plant. And that is a formal process that it would feed
18 into your PM program that components that are
19 maintenance rule still do at our sites. So we have one
20 PM program primarily.

21 And that's how this process is going to be
22 worked in our sites to get those extensions or those
23 changes. But the program and the documents and the
24 templates that were developed by EPRI were generic and
25 went out to everyone. And that's the structure. And

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1 it was built the same way we built other ones, because
2 we were building on an experience base that we had on
3 how that was done from a PM standpoint.

4 MEMBER STETKAR: Yeah, Randy, just out of
5 -- and this literally is a curiosity. I'm not trying
6 to lead you anywhere. You mentioned that that PM
7 process applies for -- I thought you said equipment
8 that's not covered by the maintenance rule. If I have
9 a -- I'll call it a valve or a pump; I'm trying to be
10 not very specific, similar pieces of equipment that are
11 either under the maintenance rule or not under the
12 maintenance rule, how would the PM frequencies or the
13 types of activities that you perform be different if
14 a piece of equipment is now under the maintenance rule?

15 MR. BUNT: Typically it wouldn't -- your
16 evaluation would be based on that component and the
17 functionality of that component --

18 MEMBER STETKAR: Yes.

19 MR. BUNT: -- and the importance of that
20 component to its purpose in life.

21 MEMBER STETKAR: Right.

22 MR. BUNT: There were templates that were
23 made up by EPRI for the big program. There's like close
24 to 300 of them. Some of them are power poles -- are
25 some that they have maintenance programs in them.

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1 So it varies from all sorts of components. That's why
2 I said some are maintenance rule, some aren't. Then
3 you look at that and say based on where I am -- if you're
4 at a very cold environment, your maintenance on your
5 power poles may be different than it would be if you're
6 in a southern environment. So, but the template is
7 going to be structured the same way based on these
8 parameters and the importance of that piece of
9 equipment to serve its function. And typically you'll
10 be able to find your crit (phonetic) nature of it so
11 that you can then decide how much margin I'm able to
12 use in developing that, at a very high level.

13 MEMBER STETKAR: Yes. I guess I'm not
14 communicating very well. Let me take two four-inch AC
15 motor-operated double-disc gate valves, one of which
16 is out in the secondary side of the plant and is not
17 subject to the maintenance rule because I've done my
18 screening, the other of which is subject to the
19 maintenance rule because I've determined that it is
20 important to safety. They're both AC motor-operated,
21 double-disc, four-inch gate valves.

22 Now how would the way that I approach
23 preventive maintenance, either the types of
24 maintenance that I do or the frequency of that
25 maintenance, or the frequency of testing, be different

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1 if that valve B is under the maintenance rule as opposed
2 to valve A, which is not under the maintenance rule?
3 That's what I'm trying to get at.

4 MR. FORD: Let me take a shot at that. The
5 PMs themselves are not influenced as to whether or not
6 the component is under the maintenance rule. You set
7 the PMs based upon the function of the valve is at a
8 high-critical, low-critical. What is its function?
9 Now many of those same features that define whether or
10 not it's a high-critical component that you do all of
11 this maintenance on also overlapped with the criteria
12 that would decide whether or not something is in the
13 maintenance rule.

14 So just because it's in the maintenance
15 rule or out of the maintenance rule doesn't really
16 define the PMs. The maintenance rule has you set goals
17 for unavailability, for failures based upon previous
18 history, based upon the risk of the component, and then
19 monitor to see whether or not the equipment is meeting
20 those goals. And if not, take action to address it.
21 But in and of itself it doesn't really drive what PMs
22 you do and what PMs you don't do.

23 CONSULTANT SHACK: But it could drive how
24 long it could be out of service.

25 MR. FORD: It could impact that and then

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1 it would push you to take corrective action if it
2 exceeded those. Now, out of service times I've seen
3 in general in the maintenance rule are fairly long. So
4 where I've seen people exceeding their maintenance rule
5 criteria has generally been in failures and things like
6 that.

7 MEMBER STETKAR: But under the
8 maintenance rule, under this reliability, if I keep
9 extending my analogy here with my two valves, A which
10 is not under the maintenance rule but has a set of PMs,
11 and B which is under the maintenance rule but has the
12 same PMs, at least initially going in. There's no
13 reason to believe that they should be different. If
14 I observe degraded performance on valve B, that it's
15 not meeting its reliability criteria, I may need to
16 either test it or perform that PM more frequently for
17 that valve B, but I don't on valve A because I don't
18 monitor its reliability. So it stays the same as it
19 always was in life, right? Or am I --

20 MR. BAUER: You monitor its reliability.
21 You just don't take the actions under the maintenance
22 rule that you would take. I mean, if the
23 reliability --

24 MR. FORD: We do have a responsibility to
25 monitor outside of the maintenance rule for repetitive

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1 events and take corrective actions. So if I saw valve
2 A, that is a safety-related great valve, having
3 problems and that same problem could affect other
4 components, whether they're in the maintenance rule or
5 not; you know, it all depends upon what the issue is,
6 you would potentially take extent of condition actions.
7 But that all depends on what the condition is.

8 So the maintenance rule is a way to monitor
9 for whether or not equipment is meeting established
10 performance thresholds. I mean, that's what it does.

11
12 MEMBER STETKAR: Thank you.

13 MR. BAUER: That completes our
14 presentation pending any further questions.

15 CHAIRMAN SCHULTZ: Other questions from
16 the Committee?

17 (No audible response)

18 CHAIRMAN SCHULTZ: I'd like to go right
19 straight to the NRC presentation then. Eric?

20 MR. BOWMAN: Well, good afternoon. I'm
21 Eric Bowman. For those of you that don't know me, I'm
22 a special advisor in the Japan Lessons Learned
23 Division. I was the author of the Mitigating
24 Strategies Order and one of the points of contact on
25 the recent SECY for the proposed rule for the mitigation

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1 beyond design basis event. So I'll be talking about
2 the Draft Guide 1301, which we propose to issue in a
3 final form in conjunction with the publication of the
4 proposed rule.

5 To my right Clint Ashley from the Office
6 of New Reactors. He'll be speaking specifically on
7 Appendix A which provides the guidance for new reactor
8 designers for meeting the proposed section of the rule,
9 50.155(d) for design features for new reactors.

10 The current status we're in, Draft Guide 1301 is
11 in a preliminary draft form. It's not yet final. As
12 you heard from the Industry Working Group, or the
13 industry panel, NEI 12-06 is not yet finalized. We're
14 awaiting the development of Appendices G and H for the
15 flooding and the seismic reevaluations. Most of the
16 rest of the changes have been entered into NEI 12-06
17 in order to account for the lessons learned and the
18 implementation of the Mitigating Strategies Order, as
19 well as to make some adjustments for use as a basis for
20 Regulatory Guidance for the rulemaking.

21 The Draft Guide itself builds on what we
22 issued on 2012 as Interim Staff Guidance
23 JLD-ISG-2012-01, taking into account, as I said, the
24 lessons learned as well as the Staff Requirements
25 Memorandum on COMSECY-14-0037 on the evaluation of the

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1 flooding hazard.

2 I set up the presentation to just run
3 through the staff positions, which are in general
4 clarifications of what is in NEI 12-06. It's been
5 slightly differently than things were in the Interim
6 Staff Guidance. I tried to align it more closely with
7 what the requirements in the order, or in the proposed
8 rulemaking are rather than the way that the Interim
9 Staff Guidance was. The staff position 1.1.a was on
10 the development of the baseline capabilities.

11 "Baseline capabilities" is the term that's used
12 in NEI 12-06 in Sections 1 to 3 for the capability of
13 the plant to maintain core cooling, containment and
14 spent fuel pool cooling capabilities given the initial
15 conditions and assumptions that are contained within
16 that particular set of guidance. We believe that the
17 baseline capabilities that would be developed
18 following NEI 12-06 will provide an acceptable method
19 to meet the requirements of the proposed order.

20 Three other staff positions in Section
21 1.1. The maintenance of the strategies. I've carried
22 forth the staff position that was in the Interim Staff
23 Guidance. I've have discussions with Scott Bauer in
24 the industry as well as public stakeholders on what is
25 meant by that. That particular paragraph might be

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1 interpreted by some to mean that there needs to be a
2 continuous maintenance of the duration for which a
3 licensee can maintain the functionalities.

4 What's really intended in that paragraph
5 is to highlight the differences between the regulatory
6 requirements that are in the station blackout rule,
7 50.63, and what was in EA-12-049, the Mitigating
8 Strategies Order, and proposed to be carried forward
9 into 50.155(b), which is -- under the station blackout
10 rule there was a requirement to establish a capability
11 to withstand and recover from a station blackout of a
12 specific duration, but it was only to do that once.

13 We included the requirement in the order
14 and we're proposing to include it in the rule that the
15 mitigating capabilities need to be maintained
16 throughout the life of the plant. So for example, if
17 a licensee were to come into compliance; just to take
18 a PWR example, with original equipment, reactor coolant
19 pump seals, and later change out the seals for
20 low-leakage seals, they would have to readjust their
21 strategies to account for the changes in the coping
22 durations that would result from the lower leakage.

23 Then paragraph C and paragraph D in that
24 section discussion that we consider the use of best
25 estimates for the analyses that were underlying the

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1 strategies as being appropriate and that the validation
2 of the strategy for feasibility is described in
3 Appendix E as acceptable.

4 Section 1.2 is the one that Mr. Bauer
5 mentioned that he may have a concern with. I have
6 discussed it with him. I believe that we are in the
7 same place on the understanding of what should be
8 understood from that. We may need to revise the
9 wording. The intent is that the baseline capabilities
10 that we talk about in Section 1.1 and that are talked
11 about in NEI 12-06 Sections 1 through 3 are assuming
12 maintenance of the core cooling and the other
13 functionalities given the initial conditions and
14 assumptions.

15 There are contingencies. And the use of
16 the word "contingency" is carried forward from an
17 earlier document that we had issued, a Supplemental
18 Staff Guidance on the review. The manual start of the
19 cooling systems, auxiliary feedwater, HPCI, RCIC or
20 isolation condensers and the use of portable equipment
21 such as multi-meters for getting instrumentation
22 readings and also the provision of guidance on
23 controlling equipment in the absence of control power
24 are all included with NEI 12-06, but they are not
25 something that we believe it's appropriate to have

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1 included in the analyses because it would be
2 speculative to determine when failures would occur in
3 those equipments.

4 In our view, the initial conditions with
5 an extended loss of AC power would start out requiring
6 multiple failures to go to additional multiple failures
7 beyond the multiple failures that would result in a loss
8 of all AC power to include the loss of inverters,
9 etcetera. It would be a little bit too speculative to
10 compel the licensees to use as a basis for thermal
11 hydraulics analyses, however, it is appropriate that
12 they have tools in the toolbox, if you will, for what
13 to do in the event that something goes wrong. If there
14 is a failure that either prevents RCIC from starting
15 or stops it from running, they should go and manually
16 start or manually reset and restart the system.

17 The location where the contingencies are
18 included is in the seismic section of the NEI 12-06.
19 It's in Section 5.3.3, Subsection 1. And the manual
20 start and manual run for the auxiliary feedwater and
21 the RCIC and isolation condensers are in the -- as
22 individual strategies within the Appendices C and D in
23 NEI 12-06.

24 So as you were discussing earlier, the
25 seismic could be something that would have a potential

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1 to cause a need to use the contingencies, but we accept
2 that their use as tools in the toolbox is the
3 appropriate way of dealing with that potentiality.

4 Section 2, the guidance on the equipment
5 quality and design we feel is appropriate as well as
6 the guidance within NEI 12-06 on the provision of
7 reasonable protection. The provisions on reasonable
8 protection in NEI 12-06 are focused on the design basis
9 levels of hazards as they existed at the time the order
10 was issued.

11 There is, as I mentioned before, Appendix
12 Golf and Appendix Hotel to NEI 12-06. Appendix G we
13 have received an initial draft of for comment and we
14 are meeting with the industry on Appendix Hotel in order
15 to fully develop how we will be looking to the industry
16 for reasonable protection against the reevaluated
17 hazards, but we are not ready to discuss that with the
18 Committee at this time.

19 And the maintenance prescriptions in 12-06
20 that you just heard the industry speak of we believe
21 to be acceptable.

22 MEMBER RICCARDELLA: Is it the plan to
23 issue Draft Guide 1301 before we have completed
24 Appendix Golf on the issue for comment?

25 MR. BOWMAN: The timetable we're on is in

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1 the regulation process would have us issue it in
2 conjunction with the publication of the proposed rule.
3 So our schedule right now as of July 9th, we're meeting
4 with the Commission on the proposed rulemaking. And
5 sometime after that to receive direction from the
6 Commission on any adjustments that may be needed on the
7 rulemaking package prior to its publication. We are
8 shooting for having a Final Draft Guide and a final
9 underlying NEI document prior to then. So we will have
10 something out there for comment.

11 As you heard earlier the flooding
12 reevaluation portion is in a lot better shape than the
13 seismic portion. We will at a very minimum have
14 high-level discussions of what -- we may not have all
15 the "I's dotted and all the "T"s crossed, but we will
16 have an indication in order to allow stakeholders to
17 understand what is meant by the requirements in the
18 rulemaking so they can comment intelligently on the
19 rulemaking and also to gather input on any adjustments
20 we need to make in the guidance and perhaps come and
21 dot the "I's and cross the "T"s on exactly how
22 individual elements of the response to that particular
23 portion would have to be accomplished.

24 Finally, the guidance on configuration
25 control in NEI 12-06 is acceptable as well. And as I

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1 discussed, we aren't ready to discuss the reevaluated
2 hazards.

3 MEMBER RICCARDELLA: So you'll plan to
4 discuss the reevaluated hazards with us before that
5 July 9th date?

6 MR. BOWMAN: Again?

7 MEMBER RICCARDELLA: You're planning to
8 come back and discuss the reevaluated hazards before
9 that July 9th date?

10 MR. BOWMAN: If the Committee wants to
11 interact further with us on that subject, we're of
12 course happy to --

13 CHAIRMAN SCHULTZ: We don't have that
14 scheduled. We haven't even seen it yet, I don't think.
15 It doesn't exist.

16 MEMBER RICCARDELLA: Neither have I.

17 MR. BOWMAN: Okay. And with that, I'll
18 turn it over to Clint.

19 MR. ASHLEY: Thank you, Eric. Good
20 afternoon, Chairman and Committee members. As Eric
21 mentioned, my name is Clint Ashley. I work in the
22 Office of New Reactors. I was a member of a team that
23 put together the Draft Guidance, DG-1301, Appendix A
24 for new reactors.

25 This slide shows a portion of the proposed

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1 rule that applies solely to new reactor applicants.
2 And I won't read this rule out, but I do want to spend
3 a little bit of time on the terminology that's offered
4 here in this rule which is "design features," "coping
5 durations" and "human actions." I think talking about
6 this terminology now may help in the subsequent slides.

7 So when we talk about design features, it's
8 the traditional structures, systems and components and
9 their capabilities to maintain the key safety
10 functions. Examples of design features that could be
11 employed are diesel-driven or steam-driven pumps, as
12 well as the capacity of water storage tanks or even
13 electrical power supplies.

14 So when developing design features to meet
15 the proposed rule, enhance coping durations and
16 minimize realize reliance on human actions are
17 necessary considerations that a designer needs to meet.
18 So when we talk about enhancing coping durations, that
19 means that the design features should increase the
20 amount of time that safety functions can be maintained
21 early in the event before there's a need to augment the
22 plant equipment with portable equipment. And you'll
23 see in upcoming slides that our guidance provides some
24 quantitative performance criteria to meet this
25 requirement.

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1 To minimize the reliance on human actions
2 means that the design features either prevent or reduce
3 to the extent practical the need for operator actions
4 again during sort of this initial phase of the event.
5 The guidance for human actions is somewhat more
6 qualitative in nature. For example, if you have a
7 design that relies on operators to reposition dozens
8 of breakers in order to enhance coping durations, the
9 requirement is that the design features in that case
10 would reduce to the extent practical the need for those
11 operator actions.

12 So you could envision maybe having one
13 breaker that would load shed or secure a number of other
14 breakers that would tend to reduce the actions that
15 would be required by the operator. That would be a
16 design feature that could be employed. Or you could
17 simply look at the capacity of your battery and whether
18 or not there's a need to actually load shed it. So you
19 could prevent the need for load shedding in that
20 scenario.

21 MEMBER STETKAR: Clint?

22 MR. ASHLEY: Yes?

23 MEMBER STETKAR: I'll bring up my favorite
24 poster child. You're probably anticipating it. I
25 know of a new plant design, new plant, where their

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1 coping strategy to extend the battery life is to
2 de-energize everything in the main control room and
3 require the operators to go to a remote shutdown
4 facility that has alternate controls and displays that
5 aren't nearly as robust as the main control room, and
6 that's part of their strategy. Is that minimizing the
7 need for operator actions?

8 MR. ASHLEY: With respect to this guidance
9 I would not characterize that as something that we would
10 view as meeting this sort of --

11 MEMBER STETKAR: Okay. Thanks.

12 MR. ASHLEY: However, it is guidance and
13 it's one acceptable method. And I think you have to
14 look at the context of that other scenario holistically
15 to determine whether or not that's an acceptable
16 approach.

17 MEMBER STETKAR: Thanks.

18 MR. ASHLEY: So the staff views -- the
19 guidance provided in Appendix A does offer new reactor
20 designer's performance criteria that vendors can use
21 to design their plants to. And we'll talk more about
22 this criteria in the upcoming slides.

23 This slide simply highlights the
24 regulatory basis for the rule language that we just
25 talked about. And we talked about in previous

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1 sessions, current agency endorsed guidance is focused
2 on the operating fleet and reflects the fact that
3 operating reactors are constrained by existing
4 structure, systems and components and the plant layout.
5 However, without such constraints new reactor
6 applicants have an opportunity to incorporate enhanced
7 capability for mitigating strategies into the design.

8 And again, just to place emphasis on this,
9 such design features should reduce reliance on and
10 simplify the manual actions necessary to maintain and
11 restore the key safety functions and allow more time
12 to assess plant conditions and prolong the use of
13 installed equipment as compared to the current
14 operating reactors. This approach we feel is
15 consistent with the policy statement on regulation of
16 advanced reactors in which the Commission encouraged
17 vendors to include certain design features into the
18 plant design, and the most effective opportunity to so
19 is during the design of those systems, structures and
20 components.

21 There's other example on this slide with
22 the approach taken for the aircraft impact assessment
23 as well as the station blackout rule where the
24 Commission directed the staff, or approved the staff's
25 position to require an alternate AC source.

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1 MEMBER CORRADINI: Can I ask a question?
2 So the last speaker from the industry made a point of
3 saying that this is AP-1000 only. Is this AP-1000
4 only?

5 MR. ASHLEY: No, NEI 12-06(f) --

6 MEMBER CORRADINI: I didn't think so. So
7 I want to be --

8 MR. ASHLEY: -- is AP-1000 only. That's
9 the industry guidance. This is the Appendix A of the
10 Draft Guide.

11 MEMBER CORRADINI: Okay.

12 CHAIRMAN SCHULTZ: That's the industry
13 guidance that is in the current document.

14 MEMBER CORRADINI: Okay.

15 CHAIRMAN SCHULTZ: NEI described the
16 opportunity to enhance that.

17 MEMBER CORRADINI: I misunderstood.
18 Sorry. Thank you.

19 MR. ASHLEY: Next slide, please. So, Dr.
20 Corradini, this might better answer your question, or
21 more satisfy you.

22 MEMBER CORRADINI: He's satisfied me, but
23 go ahead.

24 (Laughter)

25 MR. ASHLEY: The purpose of this slide is

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1 to communicate that Draft Guide 1301, Appendix A takes
2 advantage of the significant body of work done for the
3 operating plants and is applying that to new reactors.
4 In particular, Draft Guide 1301, Appendix A refers back
5 to the positions taken in the main body of Draft Guide
6 1301, which as Eric discussed, endorses NEI 12-06 with
7 certain clarifications. And Appendix A adds
8 clarifications as well, where needed.

9 Appendix A also provides guidance related
10 to enhanced coping durations and human actions, which
11 are areas that are not specifically addressed in NEI
12 12-06 due to the fact that paragraph D of the proposed
13 rule is a fairly recent addition and is limited in its
14 applicability.

15 So with that said, the approach on the
16 remaining couple slides on Appendix A in this
17 presentation is really trying to provide examples of
18 where Appendix A guidance is different from the
19 guidance that's provided in NEI 12-06, and by extension
20 to the main body of Draft Guide 1301.

21 And I also think it's fair to say that the
22 primary focus on Appendix A is really the initial phase,
23 the Phase 1 response.

24 Next slide. So this slide highlights the
25 Phase 1 response, or what's also referred to as the

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1 initial response phase. And during this phase the
2 guidance in Appendix A is focused on the design features
3 or plant equipment. So it makes sense there will be
4 differences between NEI 12-06 and Appendix A. That
5 should be expected.

6 So regarding the first bullet, Appendix
7 A's Phase 1 guidance relies on plant equipment from
8 event initiation out to at least 24 hours. In
9 contract, NEI 12-06 guidance does not specify
10 performance criterion for the Phase 1 coping duration.
11 The staff's reasoning for selecting this duration took
12 into account coping information associated with
13 certified designs and operating reactors. For
14 example, the AP-1000 design and the ESBWR can cope
15 initially for out to 72 hours with plant equipment.
16 The ABWR design can cope out at least 36 hours
17 initially. And operating plants in general have an
18 initial coping duration of roughly four to eight hours
19 using plant equipment.

20 So given this information, the team in New
21 Reactors proposed that new reactor designs, in order
22 to meet the rule, the enhanced coping duration aspect
23 of the rule, should have an initial coping duration of
24 at least 24 hours, where 24 hours is considered the
25 minimum duration for the design feature capabilities.

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1 And this coping duration does two things: First, it
2 provides operators with ample time to implement the
3 on-site portable equipment strategy; and second,
4 establishing a time helps contribute to regulatory
5 stability and predictability for advanced reactors
6 with respect to the proposed rule.

7 The second bullet means that plant
8 systems, structures and components or installed
9 equipment are designed and qualified to perform their
10 intended mitigation functions during and following the
11 external event. And just as an example, what we're
12 looking for is we expect the equipment that's
13 responding during Phase 1 to be dynamically qualified.

14 The third bullet simply reflects that new
15 reactor designs; and this shouldn't surprise anyone,
16 will be reviewed using the current agency endorsed
17 methods for hazard analysis. We're not anticipating
18 any sort of reevaluated hazard approach for new reactor
19 designs.

20 The idea with respect to the fourth bullet
21 is to reinforce the expectation that Phase 1
22 structures, systems and components or installed
23 equipment are protected from all hazards regardless of
24 warning time. In contrast, NEI 12-06 does permit
25 warning times. And so in essence, when you conform to

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1 this position for new reactors, you retain the
2 capability for plant equipment response to the hazard
3 that results in an extended loss of AC power or
4 concurrent with a loss of normal access to the ultimate
5 heat sink.

6 The fifth bullet is with respect to the
7 seismic hazard. And what we wanted to see is a similar
8 level of protection for all plant equipment credited
9 in the Phase 1 response. For the protection of
10 safety-related SSCs a design cert applicant performs
11 a PRA-based seismic margins analysis. That
12 demonstrates that, in my words, a margin factor of 1.67
13 is achieved.

14 Appendix A seeks to apply the same factor
15 to non-safety-related SSCs which are credited with
16 maintaining or restoring the safety functions during
17 Phase 1. So for example, if an applicant credits an
18 non-safety-related diesel pump and its associated
19 related water source in Phase 1, then the applicant
20 should demonstrate that protection for the pump and
21 water source will survive the site-specific hazard or
22 GMRS, ground motion response spectra, times 1.67 with
23 high confidence of low-probability failure.

24 For the sixth bullet NEI 12-06 does make
25 mention of crediting a bunkered or hardened AC power

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1 supply provided it is adequately protected from
2 external events. Appendix A refers to this as a
3 supplemental AC source and clarifies that it can be
4 credited after eight hours. The basis for eight hours
5 is considered to be an enhancement to the coping
6 durations typically available in current designs and
7 we think it allows for increased flexibility in the
8 on-site response. And we also believe that you can
9 design the supplemental AC source with minimal operator
10 actions needed with respect to the early phases of the
11 event. And I'll talk more about supplemental AC in a
12 later slide.

13 And just on that last bullet, we would
14 expect in Phase 1 that there would be minimal operator
15 actions. And these actions would occur in protected
16 locations.

17 Next slide. This slides highlights the
18 Phase 2 and Phase 3 response. The first two bullets
19 and the last bullet kind of identify some differences,
20 and the third bullet is more of a clarification.

21 So with the first bullet we define the
22 Phase 2 enhanced coping duration. It starts at 24
23 hours, or when the end of Phase 1 would occur; could
24 be a little bit more than 24 hours, and extends out to
25 at least 72 hours. The 72-hour duration is consistent

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1 with advanced reactor capabilities. And many of the
2 operating reactors that I've looked at they can easily
3 carry out a portable equipment strategy out to 72 hours.

4 We believe this coping duration permits
5 the plant to maintain safety functions with the on-site
6 resources without the need to burden the local
7 community that is likely struggling with its own
8 disaster response. In addition, this coping duration
9 provides again ample time for operators to implement
10 the off-site equipment strategy. We also believe that
11 specifying this time also creates regulatory stability
12 and predictability for advanced reactors with respect
13 to the proposed rule.

14 The second bullet conveys that Appendix A
15 limits the options that are currently available in NEI
16 12-06 for storing on-site portable equipment. And we
17 limit the options to either a safety-related structure
18 or a structure designed for design basis wind hazards
19 to include missiles. I believe NEI 12-06 also includes
20 an option that permits crediting building separation.
21 And for new reactors we didn't want to take advantage
22 of that option. So we limit it to the two points on
23 the slide.

24 The third bullet is more just motherhood
25 and apple pie. There could be cases where plant

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1 equipment is leveraged in Phase 2 and Phase 3 that may
2 not have been leveraged in Phase 1. We just want to
3 make sure that that's the intent and you know about that
4 in advance, that it should be capable to function after
5 the event.

6 And for the last bullet -- yes?

7 MEMBER POWERS: The question that caused
8 me pause when I read it is I was thinking in terms of
9 a rather extensive flood and the question of
10 connections.

11 MR. ASHLEY: I'm not sure I --

12 MEMBER POWERS: Well, does the plant
13 equipment have the capability to function after the
14 external event? So if I have a very bad flood, might
15 not connections not be capable of functioning after the
16 external event?

17 MR. ASHLEY: Well, I think we were looking
18 at more in the sense of it might not have to operate
19 during the event, but that if you were going to credit
20 it for functioning in Phase 2 or, 3 that external event
21 didn't somehow invalidate your design. So obviously
22 the flood would have to have receded to gain access to
23 that connection. That connection should have been
24 protected sufficiently so that you'd still be able to
25 tie into that connection. I'm not sure if I'm getting

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1 to the point that you were driving at.

2 MEMBER POWERS: Well, I mean, it's an
3 assertion and a clarification. And you're saying,
4 okay, I don't care how much mud comes in and things like
5 that, you should be able to get to that connection.

6 MR. ASHLEY: If you're crediting a
7 connection, then we want to see that it has a
8 representative design basis associated with it.

9 MEMBER POWERS: I understand what your
10 words mean now.

11 MR. ASHLEY: And for that last bullet we
12 just view the off-site equipment response for Phase 3
13 would commence no earlier than 72 hours.

14 Next slide, please. So we talked a little
15 bit about supplemental AC already. Really, I just want
16 to identify the three other points on this. We talked
17 about the eight-hour criterion and where that came
18 from.

19 We also looked at supplemental AC being
20 permanently installed, normally disconnected from the
21 bus, diverse and independent source from the emergency
22 AC source. And we also want to show that the
23 distribution and the loads are required to have a
24 similar level of protection against external hazards.

25 MEMBER STETKAR: Okay. Clint, now I'm

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1 suddenly going to start talking again. I don't get
2 this. This sounds to me like yet another person's
3 emergency diesel generator. We've already
4 established that the hazard has eliminated all of the
5 emergency diesel generators that I have installed in
6 my plant. So why won't it eliminate this one? In
7 particular, I will quote from the guidance. It says
8 that "the AC source distribution system and necessary
9 load should be protected per Section 3.2 of this
10 appendix."

11 Then I go to Section 3.2, and I will read
12 two paragraphs. "SSCs relied on during Phase 1 should
13 be protected to safety-related criteria; e.g., Seismic
14 Category 1 and flood protection in accordance with
15 Regulatory Guide 1.102, Flood Protection for Nuclear
16 Power Plants, to be capable of performing the intended
17 safety functions during and following the external
18 event. SSCs and equipment relied upon during Phase 1
19 should be protected from all external events regardless
20 of the warning time."

21 Sounds like all of my emergency diesel
22 generators satisfy that criterion.

23 "For seismic events the applicant may
24 propose an alternative approach to ensuring a level of
25 protection consistent with a site hazard including a

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1 safety margin to demonstrate that the overall high
2 confidence of low-probability of failure is equal to
3 or less than one percent at the site-hazard times a
4 margin factor, GMRS times 1.67, which is consistent
5 with that used in the plant design assessment."

6 But it sounds to me like as long as I put
7 this diesel in and qualify it for Seismic Category 1
8 and meet the Reg Guide 1.102 flood protection, which
9 I've already met for all of my safety-related diesels,
10 which are already be definition failed by this external
11 hazard -- by definition this one survives. Why is that
12 and why does the staff accept that?

13 MEMBER RICCARDELLA: What's the meaning
14 of "diverse?" Independent I guess is what you're
15 asking.

16 MEMBER STETKAR: I could argue
17 that it's diverse because I used Joe's diesel that is
18 a 6-cylinder diesel as opposed to Ralph's diesel that
19 is a 16-cylinder. So you can argue diversity perhaps.
20 Independent, not so much. But protected against the
21 external hazards. The guidance just says that I need
22 to protect it the same as the stuff that by definition
23 was failed.

24 So I get having a portable diesel generator
25 on a truck inside a shed someplace not in my emergency
diesel building. I get that. I kind of like that

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1 idea, personally. But I don't get yet another
2 so-called super good diesel that is designed and
3 protected exactly the same as my other super good
4 diesels that are disabled. So I don't understand this.
5 I honestly don't understand this.

6 If you said it shall be protected for a
7 margin of two or three above the design basis
8 earthquake, then I get it. But that's not what this
9 guidance says.

10 MEMBER CORRADINI: In fact, I seem to
11 remember with one particular new plant what proposed
12 seemed diverse and seemed protected. They didn't get
13 credit.

14 MEMBER STETKAR: Right.

15 MEMBER CORRADINI: So I also don't get it.

16 MR. ASHLEY: Well, let's see where I can
17 take this. I understand the problem is provided to new
18 reactors as far as the rule goes. I mean, it's
19 deterministic. It's an extended loss of AC power which
20 included the off-site sources of power as well as the
21 emergency AC sources and your station blackout diesel.

22 From my perspective, this supplemental AC
23 source was really in a sense targeted at more of that
24 station blackout diesel which hadn't been
25 traditionally protected through all of the external

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1 hazards. So this supplemental AC source, again from
2 my perspective -- and I would have to call on the
3 Electrical Engineering Branch in the room to maybe
4 speak to this more eloquently, but the station blackout
5 diesel just doesn't have the type of protection. And
6 so this diesel would bring forward that level of
7 protection to the external hazard and it would also be
8 diverse and independent.

9 MEMBER STETKAR: Let me draw an analogy on
10 digital instrumentation control. We have a lot of
11 angst about digital instrumentation control systems
12 and -- I knew I'd wake up Charlie --

13 (Laughter)

14 MEMBER STETKAR: -- common cause
15 failures, undefined common cause failures for which we
16 require a diverse actuation system that is not reliant
17 on the same software, that's perhaps analog that may
18 be non-safety-related, but it's clearly diverse. This
19 to me is just another piece of equipment that's designed
20 to the same requirements. And I can call it a gas
21 turbine, but if indeed I protected against the same
22 seismic event, beyond design basis seismic event that
23 by definition fails; and I don't care how many have,
24 12 other redundant diesel generators, why does this
25 13th piece of equipment suddenly win when those other

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1 12 lost?

2 MR. BOWMAN: If I could chime in --

3 MEMBER STETKAR: I don't get it.

4 MR. BOWMAN: -- with some of the
5 experience that we've had in the reviews of the
6 operating reactors; this is Eric Bowman again, for
7 specific hazards we have had experience with licensees
8 proposing to install AC power sources that are
9 protected to a great degree over the hazard. In
10 particular, the flooding hazard. Some licensees,
11 they've chosen to put generators on the roofs of their
12 auxiliary buildings, in seismic structures that are
13 missile-protected. And we have found that to be a good
14 approach to the problem of what do you do if you get
15 a design basis, or a beyond design basis flood because
16 the top of their auxiliary building is, I don't know,
17 50, 75 feet above their design basis flood.

18 (Simultaneous speaking)

19 MEMBER STETKAR: -- has decided to put
20 stuff in the basement because that was a good idea to
21 protect it against seismic accelerations. Not so good
22 for floods.

23 MR. BOWMAN: Right. Not a good idea for
24 flooding though.

25 MEMBER STETKAR: Yes, so --

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1 (Simultaneous speaking)

2 MEMBER STETKAR: -- for floods.

3 MR. BOWMAN: Right.

4 MEMBER STETKAR: Not so good for seismic.

5 MR. BOWMAN: Right. And in particular,
6 one place for their design basis flood, they would not
7 have been capable of dragging the generator on a trailer
8 over because of the 12 feet of water, or whatever the
9 depth of water was. So this was a good approach for
10 that specific type of hazard. And we had discussed the
11 option in the Advanced Notice of Proposed Rulemaking
12 for the station blackout mitigating strategies rule of
13 including a supplemental AC power source. I believe
14 that that's where NRO came up with the initial idea for
15 it. Bear in mind that this is just a draft set of
16 proposed guidance for comment and the appropriate
17 comment they might get is how much margin is enough
18 margin?

19 MR. SCHMIDT: This is Jeff Schmidt. I was
20 one of the team members. I just wanted to point out
21 that the rest of the coping equipment from zero to eight
22 hours is only qualified to the design basis. So having
23 this qualified to be beyond -- some margin beyond the
24 design basis didn't make any sense. Because if you're
25 using plant equipment to cope, you've already lost the

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1 battle in the zero to eight hours.

2 MEMBER STETKAR: Okay. That's a
3 different issue, but if you want to discuss that, that's
4 fine. If all of my switch gear falls done, I don't care
5 if I have any diesel generators. I can have like zero
6 diesel generators and it doesn't make -- so why does
7 this one more buy me anything then?

8 MR. SCHMIDT: Well, part of the --

9 MEMBER STETKAR: You want to talk that
10 way, then fine, let's have another --

11 MR. SCHMIDT: But that's --

12 MEMBER STETKAR: -- protected set of
13 switch gear and a portable diesel to connect to.

14 MR. SCHMIDT: But that's true of all your
15 plant equipment that you're using to cope --

16 MEMBER STETKAR: Yes.

17 MR. SCHMIDT: -- initially in both the new
18 reactors and the existing reactors. One of the
19 features of this supplemental AC was to reduce the
20 associated auxiliary systems that might be needed to
21 run this piece of equipment. So while you're not maybe
22 reliant on as much of the auxiliary systems that may
23 be at risk with this system as you would say your diesel
24 generators that need component cooling water and other
25 systems. It was supposed to be a simplified system.

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1 Also, the distribution system, that's why
2 we really put this last bullet in was to try to simplify
3 the distribution system such that it would be
4 potentially less at risk than your normal distribution
5 that you'd use for your emergency diesels. So there
6 are some features to this system that we would hope
7 would make it more robust than say your emergency
8 diesels.

9 MEMBER STETKAR: All of those support
10 systems for my emergency diesel are protected against
11 that Class 1 Seismic, Category Seismic 1. So just
12 because I have less of them doesn't make the piece of
13 equipment more reliable. It makes it more reliable for
14 pumps not working and that sort of thing, but it doesn't
15 make the equipment more reliable for the types of
16 hazards that we're looking at here, beyond design basis
17 flooding and seismic events that by definition, however
18 they did it, took away all of my safety-related sources
19 of power.

20 MEMBER CORRADINI: But can I ask John's
21 question a little bit differently? Maybe I'm
22 interpreting this incorrectly, so you correct me. If
23 I have a new plant but it's an active plant and it kind
24 of looks like current plants, which implies that it
25 can't get past 8 hours, you're giving them a way out

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1 between 8 and 24 hours. That's what I read this to be,
2 that I'm allowing for a diverse quite robust; "robust"
3 to be defined, system that takes me from 8 hours to 24
4 hours so I can get to Phase 2 comfortably without having
5 to have the unique features of new plants that are
6 already certified. That's my interpretation.

7 MEMBER STETKAR: Passive plants.

8 MEMBER CORRADINI: Passive plants that
9 are already certified.

10 MEMBER STETKAR: Yes.

11 MEMBER CORRADINI: That's my
12 interpretation of what I read here.

13 MR. CARUSO: Can I address that? Mark
14 Caruso. I was on the team, too. And I mean, that's
15 sort of getting at it, but I would say it differently.

16 MEMBER CORRADINI: Okay.

17 MR. CARUSO: We struggled with this issue,
18 too, very much the team did. And I think the idea here
19 was to not preclude that -- to not dismiss out of hand
20 that there was nothing that someone couldn't think of
21 and design that might satisfy, that might be useful like
22 perhaps a pump, a separate pump, diesel generator
23 connected together that's not connected to anything
24 else that could be used. It's put in place. It's got
25 a little power source. It's a pump. It's put in place

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1 in the reactor building, whatever.

2 So the idea is to try and say here that it
3 really can't be the same as the ones that you've all
4 lost. You're right about that. That doesn't make a
5 lot of sense. And perhaps we need some better guidance
6 here that communicates that. I don't think we wanted
7 to specify exactly what would be okay or not okay, but
8 to provide guidance that said it's got to be better than
9 those, but we're not going to preclude the designers
10 from trying to think of something that might work in
11 this case and be satisfactory.

12 MEMBER STETKAR: Mark, my point is as I
13 read this it doesn't have to be better than those. It
14 only has to be as good as those. It doesn't have to
15 be better. It only has to be as good. It says that
16 I have meet Seismic Category 1, and Flooding 1.102.
17 That's as good as. It doesn't have to be better.

18 MEMBER BLEY: That's the words.

19 MEMBER STETKAR: Those are the words.

20 MEMBER BLEY: Yes.

21 MEMBER STETKAR: I read verbatim a quote.

22 MEMBER CORRADINI: Can I just clarify? I
23 guess that the words that you read and the sense of the
24 oral presentation are different.

25 MEMBER STETKAR: We can hear whatever we

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1 want to hear. We read what we read and people respond
2 to the written language in the guidance. I come from
3 international experience where people have taken these
4 issues to heart and installed bunkered hardened
5 emergency power supplies in buildings that are going
6 to survive the apocalypse, but they have specific
7 design criteria for those buildings to provide
8 substantial protection above and beyond the design
9 basis of the plant for protection of that equipment with
10 all of the independent connections and the other stuff
11 that you want to do.

12 MR. ASHLEY: And in a sense --

13 MEMBER STETKAR: But that's not what this
14 is saying.

15 MR. ASHLEY: Right, and in a sense those
16 designs would prevent the extended loss of AC power.

17 MEMBER STETKAR: Right.

18 MR. ASHLEY: So we're given an extended
19 loss of AC power and we're looking for some ability to
20 provide an AC source at some point in time given the
21 right protections and the right arrangement with the
22 distribution system, everything protected. So it's a
23 little bit different, but again it's only protected up
24 to the design basis, as you've read. And we're not
25 looking to add requirements to that.

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1 MEMBER STETKAR: Well, and that's where I
2 think I'm hanging up is that -- and I have to be careful
3 here because I'm only a single opinion and I must be
4 careful to characterize it that way. If the guidance
5 said a permanently installed equipment system that is
6 protected with a specified fixed degree of margin above
7 my safe shutdown earthquake, or reevaluated safe
8 shutdown earthquake or portable equipment that sounds
9 like FLEX and things like that with adequate capacity,
10 then I'd say, okay, we've got diverse, we've got
11 flexibility, we've got the option to put in a lot of
12 concrete and steel and things like that, but that's not
13 what this guidance says.

14 MEMBER RICCARDELLA: What was that 1.67
15 factor you were discussing earlier? That's beyond
16 design basis.

17 MEMBER STETKAR: It is, but that's again
18 a quote from the paragraph. This is a quote verbatim,
19 Appendix A of the Draft Guidance. For seismic events
20 the applicant may propose an alternative approach to
21 ensuring a level of protection." And that's what it
22 gets into. But that's a paragraph that immediately
23 follows the paragraph that says, "SSCs relied on during
24 Phase 1 should be protected to safety-related criteria,
25 Seismic Category 1 and" -- so it says I'm okay if I

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1 protected to Category 1. I may, I have the option of
2 coming in and proposing an alternative approach to say
3 it's protected further than that, but I don't have to
4 do that because I'm okay as long as I make it Seismic
5 Category 1.

6 MEMBER BLEY: I mean the concern is a
7 simple one. If we're putting in one more like the
8 others that for some common causes failed, why are we
9 making people do that? It doesn't gain them anything.
10 If we're putting in something different that's somehow
11 not going to fail to that same event, then that gets
12 us something.

13 MEMBER STETKAR: But you ought to tell
14 them that they need to do that, not just to say, well,
15 you might want to think about this or you might want
16 to think about that.

17 MR. ASHLEY: I think equipment that is
18 designed to Category 1 will have this level of
19 protection that we're talking about or margin.

20 MEMBER RICCARDELLA: But that's what I was
21 getting at. You design to one level, but it can
22 -- typically something that's designed for one level
23 can survive something larger than that in a seismic
24 margins analysis.

25 MEMBER BLEY: That's absolutely true.

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1 And in the real world there's lots of examples of that,
2 but the other two that we've already got are designed
3 that way. So adding another one, if those have been
4 failed, the earthquake was big enough to get them.

5 MEMBER STETKAR: I have a new plant, four
6 trains of AC power, four redundant identical emergency
7 diesel generators all designed, installed,
8 constructed, maintained to Seismic Category 1. They
9 all have that exact same margin because the same design
10 people --

11 CONSULTANT SHACK: But as Pete says, it
12 means that they have a low probability of failure at
13 1.67 times the SSC.

14 MEMBER BLEY: That's true, but they've
15 already failed.

16 CONSULTANT SHACK: Right.

17 MEMBER STETKAR: But why do --

18 (Simultaneous speaking)

19 MEMBER STETKAR: No, wait a minute. Why
20 is my plant more reliable --

21 MEMBER BLEY: But you need it if they
22 haven't already failed with five.

23 MEMBER STETKAR: Why is my plant more
24 reliable by definition if I put in a fifth one of those
25 same things?

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1 MEMBER RAY: Because the fifth one isn't
2 located and connected the way the other four are.

3 MEMBER RICCARDELLA: And it depends on
4 what you mean by diverse and independent.

5 MEMBER RAY: There's no requirement of
6 that.

7 MEMBER BLEY: No, that's correct. I'm
8 just making a statement. If it's different enough so
9 that it will see a different earthquake, that's a clear
10 point.

11 MEMBER STETKAR: It's located a
12 mile-and-a-half away, or some place that's got better
13 --

14 MEMBER BLEY: Somehow a better protected
15 location.

16 MEMBER STETKAR: Yes.

17 MEMBER BLEY: So it's different
18 acceleration.

19 MEMBER RICCARDELLA: It hinges on the
20 definition of "diverse and independent."

21 MEMBER STETKAR: That's what we're
22 talking about though, because if I read the words, I
23 interpret these words as I could have a five-bay diesel
24 generator building that's got my four emergency diesels
25 in the first four bays, a fifth bay that's got my super

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1 good diesel in it that's -- all the concrete -- and I
2 won't even call it a diesel. I'll call it a gas turbine
3 just to avoid the diversity thing. I'll call it a gas
4 turbine. It's mounted all the same way, it's got the
5 same mass, it's at the same level. Its wires run out
6 of that building perhaps to a different set of switch
7 gear that is again designed to that same safe shutdown
8 earthquake. And why does that fifth bay by definition
9 buy me more safety than the first four?

10 MR. MCKIRGAN: So, Mr. Chairman, this is
11 John McKirgan. If I could, I think we've gotten some
12 good feedback from the Committee on this particular
13 point. We're also anticipating a lot of healthy
14 feedback from other stakeholders. And certainly not
15 to cut off the discussion, but I think we understood
16 the issue very well. And I think there's another slide
17 yet that might also engender some good healthy
18 discussion. So with your permission perhaps we could
19 just move on.

20 MEMBER RAY: Maybe we can, but let's see.
21 John, I think still I want to say I think there's an
22 assumption here that as robust as your five diesels all
23 are, the one we're talking about isn't vulnerable in
24 the same way as the other four because it isn't just
25 in a fifth compartment. Now, am I wrong about that?

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1 MEMBER CORRADINI: No, I just think John's
2 point is very simple. Just be specific as what the hell
3 you want them to do.

4 MEMBER RAY: I understand, Mike, but the
5 point is I just wanted to see if we were perceiving this
6 in the same way or if we thought this was just one more
7 of what you already have. I don't believe it is.

8 CHAIRMAN SCHULTZ: That's what we would
9 like to see, but that's not how it's described in the
10 guidance.

11 MEMBER STETKAR: It's not how it's
12 described --

13 (Simultaneous speaking)

14 MEMBER BLEY: If you did what John said,
15 you would meet the words.

16 MEMBER STETKAR: That's right.

17 MEMBER RAY: If you had a spare bay. You
18 could just build one to have one.

19 MEMBER BLEY: Okay. All right.

20 MEMBER RAY: You could do that. So our
21 problem then isn't with what we believe people are
22 assuming here. It's with how it's described and what
23 the requirements are.

24 MEMBER BLEY: Well, Harold, in various
25 times in the past when we've talked to people, we've

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1 had people tell us, no, they're going to make it somehow
2 different. And we've had other people say it would be
3 perfectly okay if it were exactly the same in Seismic
4 Category 1.

5 (Simultaneous speaking)

6 MEMBER STETKAR: And in fact some people
7 might argue that if they make it different enough, they
8 might have to then justify to the stuff why making it
9 different enough is okay. So it's okay to make it the
10 same because the staff would accept something that's
11 the same.

12 MEMBER BLEY: By the word, that's what it
13 looks like.

14 MEMBER RAY: Okay. I get the point. I
15 just wanted to make sure at least I understood, but that
16 -- yes.

17 MEMBER CORRADINI: I was going to say, but
18 I think your point at this point is fuzzy. And so
19 somehow it seems fuzzy enough that it's got to be
20 cleared up, otherwise I'm not sure where it lands.

21 MEMBER RAY: Okay.

22 MEMBER BLEY: We've also heard on many
23 occasions on different things from analysis to
24 equipment to making some changes that would be useful
25 to perhaps a computer code to make it more up to date.

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1 If I do that, it's going to take me six months to get
2 it approved. And if I use a thing that's not
3 appropriate but is approved, I'll get it done right
4 away. And that's what I'm going to do. So we've got
5 things that pressure us toward the side of the easiest
6 way to get approval. And those things cost a lot of
7 money and effort if you go outside of those criteria.
8 And what we've seen here is something written down that
9 we can't quite reconcile that it makes you do the things
10 we're suggesting would be good.

11 MEMBER RAY: Okay.

12 MEMBER BLEY: But back to their point, I
13 think we've talked about this a lot.

14 CHAIRMAN SCHULTZ: We're good to move on.

15 MEMBER BLEY: Thank you.

16 CHAIRMAN SCHULTZ: But we have set our
17 expectation. I think that clear as well.

18 MEMBER BLEY: On behalf of members.
19 individuals, yes.

20 CHAIRMAN SCHULTZ: Individual members,
21 right.

22 MR. ASHLEY: Thank you for that feedback.

23 The NRC position for applicants for new
24 nuclear power plants regarding shutdown and refueling
25 modes is considered to be an enhancement to the guidance

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1 contained in NEI 12-06. The probability of an extended
2 loss of AC power concurrent with the loss of normal
3 access to the ultimate heat sink occurring during any
4 specific outage configuration was expected to be small,
5 however, as seen in shutdown and full power
6 probabilistic risk assessment for new nuclear power
7 plants, shutdown core damage frequencies and the large
8 release frequencies are comparable to full power core
9 damage frequencies and large release frequencies. So
10 therefore, we thought it was appropriate that the
11 positions outlined in Appendix A apply to all modes,
12 including the shutdown and refueling modes and
13 applicants for new nuclear power plants should address
14 shutdown and refueling modes at the design stage.

15 MEMBER STETKAR: Clint, I'm really glad
16 you put that in there. I did have a question about some
17 of the words in Section A. In particular it says, "The
18 strategies should address any challenges to the
19 containment function in all modes of plant operation
20 in which containment is required to be maintained."
21 That to me says that if I don't need to maintain
22 containment for my normal Mode 5 or Mode 6, or whatever
23 the heck it is, typical operational events, then I don't
24 need to worry about restoring that containment function
25 for my FLEX strategies. Is that correct?

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1 MR. ASHLEY: I wouldn't view it that way.
2 And Marie Pohida --

3 MEMBER STETKAR: The reason I asked the
4 question is that's the way I read this.

5 MR. ASHLEY: Okay.

6 MEMBER STETKAR: And here again, if it's
7 created a question in my mind --

8 MR. ASHLEY: Certainly.

9 MEMBER STETKAR: -- would people use this
10 to their benefit to --

11 MR. ASHLEY: Certainly. And so --

12 MEMBER STETKAR: -- say I don't need to
13 address those conditions?

14 MR. ASHLEY: We have Marie Pohida, who
15 helped craft this section of the guidance.

16 Marie, did you hear --

17 MS. POHIDA: Yes, I heard the question.

18 MR. ASHLEY: Okay.

19 MS. POHIDA: This is Marie Pohida from the
20 PRA Group in NRO. For the advanced PWRs, advanced
21 light water reactors, many of them have added
22 containment closure tech specs for reduced inventory
23 conditions. So that would be one area where we would
24 want to see that containment closure be maintained as
25 a part of ELAP.

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1 And for BWRs there has been no upgrade to
2 tech specs in cold shutdown or refueling conditions.
3 So in that respect, for ELAP for BWRs we'd have a
4 containment closure capability only when containment
5 is required to be operable. Does that help?

6 MEMBER STETKAR: No. And I haven't
7 thought enough about all the scenarios, because I
8 haven't -- I just stumble over the words here. The
9 question that I have is if I have one of these beyond
10 design basis events during a condition when I'm not
11 required to have containment integrity for the normal
12 reasons that I think about during a cold shutdown or
13 an outage, are there conditions where I can get into
14 trouble in the core because of loss of all AC power that
15 would result in core damage where it would be good to
16 restore the containment function by closing the
17 containment? And people will say, well, I'm not
18 required to have that capability because I can have all
19 of my -- pick a designation -- AC power sources to work
20 the crane to close the hatch. I don't need those during
21 this condition because I'm not required to have them.
22 Follow me?

23 MS. POHIDA: No, I'm actually following
24 you. I'm trying to think. It gets a little sticky.
25 For BWRs once you've removed the drywell head --

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1 MEMBER STETKAR: Yes.

2 MS. POHIDA: -- which is part of primary
3 containment, that would be a fairly difficult challenge
4 to do given an ELAP situation.

5 MEMBER STETKAR: Yes.

6 MS. POHIDA: Okay? For PWRs it's a little
7 bit different. What we want to do is when -- when a
8 PWR is in reduced inventory condition, the timing to
9 core uncover and core damage can be fairly rapid. The
10 PWRs have containment closure tech specs to button up
11 the containment before steaming inside containment.
12 So that according to this guidance they would have to
13 maintain that capability following an ELAP event.
14 Does that help you?

15 MEMBER STETKAR: A little bit, but not
16 quite, because you talk about the timing and things.
17 That's for the events that you've looked at, drain down
18 events from Italy, for example. There are many other
19 scenarios that can occur that are not drained out from
20 Italy which can also get the core into trouble. The
21 time might be longer. It's not going to be
22 instantaneous. It's not going to be forever. And I
23 don't know.

24 I'm only asking the question, because as
25 I've said, I've not run through in my mind or even in

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1 practice the types of scenarios that could get you in
2 trouble and the timing of those scenarios under
3 conditions when the tech specs don't require you to have
4 the containment closed, whether it's PWR or BWR. And
5 I don't know whether this caveat in here leaves any
6 potential vulnerabilities that could be taken
7 advantage of. I just don't know. I stumbled across
8 that and it was kind of a funny-sounding thing. I get
9 it from the point of internal events, at shutdown risk
10 assessment stuff, but that's not what we're talking
11 about here.

12 MR. ASHLEY: We'll have to take that under
13 further consideration.

14 MEMBER STETKAR: And you're right, it it's
15 onerous. I know I got to put the drywell head back on
16 very quickly anyway. And I may not be able to move the
17 equipment hatch back in place and seal it very quickly.

18 MR. ASHLEY: I think the focus here is on
19 preventing core damage from occurring. And so in the
20 sense that what Marie described with the BWR example,
21 not putting the head back on doesn't really have any
22 consequence.

23 MEMBER STETKAR: And I agree with that. I
24 prefaced it by I'm really happy you put the guidance
25 in that it has to apply to refueling and shutdown modes

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1 that I need to make sure that I can keep the -- prevent
2 core damage during those modes and that I need to think
3 about the ability to restore the containment if it's
4 not there. It's just a question of how far does that
5 containment go?

6 MR. ASHLEY: That concludes my
7 presentation slides there.

8 CHAIRMAN SCHULTZ: Are there questions or
9 comments from the Committee on this topic?

10 (No audible response)

11 CHAIRMAN SCHULTZ: All right. With that,
12 I'd like to move to the next topic before we break, So
13 Steve and Randy, would you like to come forward and
14 exchange places with the staff? We'll move into spent
15 fuel pool instrumentation.

16 Steve, are you going to lead off or is
17 Randy?

18 MR. KRAFT: I shall, Mr. Chairman.

19 CHAIRMAN SCHULTZ: Thank you.

20 MR. KRAFT: Very good. Thank you, Mr.
21 Chairman. As indicated, I am Steven Kraft from the
22 nuclear industry. You all might wonder why I called
23 you together today. We wanted to see you again. We
24 don't come here often enough.

25 MEMBER STETKAR: But it's so pleasant when

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1 you do.

2 MR. KRAFT: Dr. Stetkar, I always look
3 forward with great anticipation to sitting in the back
4 of the room and listening to other people enjoy
5 your --

6 (Laughter)

7 MR. KRAFT: -- and hoping you'll go
8 overtime and leave us off the agenda altogether.

9 CHAIRMAN SCHULTZ: Didn't happen.

10 MR. KRAFT: No. I would note for general
11 interest that we have not visited spent fuel pool
12 instrumentation for quite a while, so it's not a bad
13 idea to talk about it. And I am accompanied today by
14 Randy Bunt from Southern Company. Randy and I have
15 grown old together working on --

16 MEMBER BLEY: Just the last couple of
17 years.

18 (Simultaneous speaking)

19 MR. KRAFT: -- past Fukushima. I used to
20 be 6'5" with a full head of hair. I have pictures to
21 prove it.

22 In any event, so let's move on. We have
23 another session after this one, too.

24 One of the questions we got asked is had
25 we revised the guidance NEI 12-06 for spent fuel pool

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1 instrumentation since Rev. 1 was issued. And the
2 answer is no. There's been no need to do so. You can
3 see here from the status the dates have been provided.
4 The important thing is at the bottom. At the end of
5 2014, 18 units have completed their installation of
6 SCPI. At the end of the refueling outages in the
7 spring, Randy, you were telling me you thought about
8 half were done?

9 MR. BUNT: I think we'll be close to about
10 50 by that time.

11 MR. KRAFT: Yes, it tracks FLEX somewhat
12 except that FLEX does have exemptions for a variety of
13 reasons typically on the BWR side, the vent water and
14 on the PWR side the RCP seals that don't affect this,
15 and so people moving along. And fully all will be done
16 by 2016.

17 There are three vendors involved, all
18 radar-based technologies of one kind or another. And
19 I would point out; and this is just an example of what
20 happens when we get involved in these things, the
21 initial staff informal over-the-phone estimate for the
22 cost of installing at one unit was \$250,000. I
23 received a phone call one Saturday asking me that
24 question. And after I stopped laughing, we went
25 through some of the costs. It is now in the 3 to \$5

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1 million range per unit.

2 MEMBER BROWN: What do you expect from
3 radar stuff? I mean, my God, you've got a -- there's
4 a float and a hard set of wires going out to little red
5 lights. I've done this for about 25 cents.

6 MR. KRAFT: Absolutely.

7 MEMBER BROWN: I'm being a little bit
8 facetious, but --

9 MR. KRAFT: No, you're not being
10 facetious, Dr. Brown. I am absolutely --

11 MEMBER BROWN: Everybody has to go
12 high-tech instead of doing some very simple qualified
13 --

14 (Simultaneous speaking)

15 MR. KRAFT: I'll tell you exactly what the
16 problem was.

17 MEMBER BROWN: -- thing.

18 MR. KRAFT: First was --

19 MEMBER BROWN: Excuse me.

20 MR. KRAFT: First was -- yes, I plead
21 insanity all the time. First was, frankly the
22 requirements grew at the very last minute. There were
23 uncomfortable discussions, I would say; Randy --

24 MR. BUNT: Correct.

25 MR. KRAFT: -- about seismic and shock and

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1 vibration that we had to accommodate. And secondly,
2 when the utilities began looking at these simplified
3 technologies -- frankly, I'd like the camera WiFi'ed
4 out to an iPad somewhere, tell you the truth. But no
5 one wanted to attach anything to the pool liner. So
6 once you've got a cantilevered unit over the water, then
7 you're almost talking radar by definition.

8 So the question there became which ones
9 would be applicable? Don't ask me to describe the
10 technologies. I had to sign non-disclosure agreement
11 with all three vendors and I don't know where I cross
12 the line into technology I shouldn't talk about. But
13 it is sufficient to say that they are, as Dr. Brown
14 points out, very high-tech in their application.

15 Rev. 1 was endorsed by an ISG in 2012.
16 There were six technical clarifications and
17 exemptions. I believe this was the only ISG of the
18 three that endorsed the initial guidance orders that
19 had technical clarifications. And that was because
20 there were items, as I referenced, particularly in
21 seismic that we that we just simply didn't agree with.
22 And while NRC has a right to impose requirements, we
23 were not going to write them into our own guidance if
24 we thought they were not appropriate, which doesn't
25 mean that they should not be adhered to, of course.

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1 The new rule will make this all generally
2 applicable. And I will say that that's whereby hangs
3 the tail at the end of this discussion where we do have
4 some concerns, and of course this Reg Guide we're
5 looking at.

6 When I looked at the ISG and the new Draft
7 Guide; and I literally did on my desk with a ruler
8 word-to-word comparisons because I was looking to see
9 if I was missing anything, because a brief read looked
10 okay, I found two differences that are worth
11 mentioning. This first one is not nearly very
12 important, but we referenced the -- to demonstrate
13 reliability and the ease of change-out of the devices
14 in NEI 12-02, that they needed to demonstrate -- I'm
15 sorry. Back up. I'm saying that wrong. Reliability
16 had to be demonstrated during the event. NRC staff
17 comes back and says, no, no, during and following the
18 event. I don't think that's too logical. Randy and
19 I were talking about this yesterday. I --

20 MEMBER BROWN: Why would after the event
21 not be common sense?

22 MR. KRAFT: Because I think it may have
23 been a drafting error on our part. I mean, I've to go
24 back in my memory.

25 MEMBER BROWN: Not in my thought

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1 processes. We were having this discussion earlier.
2 Months ago. Maybe a year ago. I can't remember how
3 much long ago it was.

4 MR. KRAFT: And what -- I'm sorry.

5 MEMBER BROWN: I mean, why wouldn't you
6 -- well, you saying following with the -- I read some
7 words in the old 12-02.

8 MR. KRAFT: Yes.

9 MEMBER BROWN: It shall be required to be
10 functional until additional off-site resources can be
11 obtained. At some point you can have it off.

12 MR. KRAFT: That's correct. Once you've
13 re-powered your existing systems, I suppose.

14 MEMBER BROWN: Well --

15 MR. KRAFT: But you said -- but we -- if
16 following is a requirement, we did not pick up that
17 change. And I have to say it may have been a drafting
18 error on our part not picking up that change. But the
19 important point here is not to argue that, but when you
20 look at DG-1317, they went back to "during" and left
21 out the "following," which I'm assuming was because of
22 a redrafting error on their part. So it just needs to
23 be fixed. No big deal to pick that up. I recommend
24 the language from --

25 MEMBER BROWN: You're not arguing with

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1 "following the event?"

2 MR. KRAFT: No. No, I'm just pointing out
3 that there was a difference in the language.

4 MEMBER BROWN: During the event and after
5 the event.

6 MR. KRAFT: Absolutely.

7 CHAIRMAN SCHULTZ: Any difficulty with
8 the choice suggested?

9 MEMBER BROWN: I think the bottom line is
10 where we want to be.

11 MEMBER STETKAR: On, no, this is the
12 bubble a little bit. This on the other hand, if I can
13 point out, just raising this view graph and discussing
14 "during and following" versus -- those three words
15 within different versions comes back to what I was
16 reading before. People apparently hang on every
17 nuance of every single printed word in each of these
18 documents.

19 MR. KRAFT: If you like this one, wait
20 until the next one.

21 MEMBER BROWN: It's a good example.

22 MR. KRAFT: We do hang on every word
23 because every word is meaningful. And I remember being
24 in meetings on these orders a long time ago where we
25 questioned the inclusion of a paragraph and were told,

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1 oh, it's boilerplate. And my answer was if it's
2 boilerplate and has no meaning, remove it. It has
3 meaning. The fact that the engineer didn't write it
4 and the lawyer wrote it doesn't mean it deserves
5 derision. It means it has meaning the engineer needs
6 to understand.

7 So that takes me to the last slide and the
8 last issue. We have a reference in our guidance about
9 the use of -- I mean, we say commercial components
10 throughout the document, which we wanted to be simple,
11 off-the-shelf kind of technology. And we said
12 commercial components shall -- we made it a shall.
13 Now, this is about "shall," "should," "may." People
14 who write language for regulations and guidance, words
15 like "shall," "should," and "may" are very, very big
16 deals, because they mean things. And to the point that
17 the Committee are making, they mean different things
18 to different people and get interpreted differently and
19 then get used and abused in ways that are not okay.

20 So here, staff came back and said, no, no,
21 no, we want -- it's a you may choose, may consider
22 commercial; so it is a permissive, not a must, and you
23 may choose safety-related. So it is a permissive, kind
24 of an indication that maybe we'd like you to think about
25 safety-related. However, look what they did when they

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1 issued DG-1317. That second "may" became a "should,"
2 should consider safety-related.

3 So think about what we're doing here with
4 this spent fuel pool instrumentation. Should have
5 been simple, easy, beyond design basis.
6 Safety-related requirements do not apply if you were
7 out post-Fukushima at all. Why would you now apply
8 them here?

9 Now you could argue it's a "should." When
10 you put a "should" in a requirement, what happens is
11 that at the plant level the modification engineer reads
12 it as a "shall," because if he or she doesn't, he's
13 arguing with an inspector as to why they made the choice
14 they made.

15 CHAIRMAN SCHULTZ: And let me interrupt
16 you just because I don't know. These are important
17 points you're making. The only place I've seen these
18 very clearly defined is in say an ASME standard where
19 "may" doesn't mean much at all, "should" means we'd like
20 you to, but you don't have to, and "will" means, yes,
21 you're going to do it, or "shall" means you're going
22 to do it.

23 MR. KRAFT: There is a --

24 CHAIRMAN SCHULTZ: But that's not
25 regulation. I don't know what they mean in regulation.

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1 MR. KRAFT: There is a memory I have from
2 many years ago looking at some NRC document that said
3 when the standard -- it may have been when I was on an
4 ASTM Committee 40 years ago. When the standard says
5 "may," "should," and "shall" the way you described it,
6 it gets read as "should" and "shall." Now, I'm not
7 speaking for NRC, but I remember reading something
8 like. Certainly that's the way it gets interpreted.
9 So this is regulatory creep.

10 And when you read this language in
11 conjunction with the use by NRC paragraph, which are
12 the future-fit requirements, not going to be imposed
13 back on any current licensees, all good. But the
14 moment you change the technology -- so 10 years from
15 now we want to change these out, there's no technology,
16 maybe technology that's easier to maintain, more
17 reliable, whatever, you change the licensing basis, all
18 of a sudden this may pop up as applying. So it is not
19 consistent with principles of the regulation, all that
20 stuff. And we recommend going back to the use of the
21 language they had in the ISG.

22 So I was thinking we would capture this in
23 a comment letter, except didn't I read on a slide
24 earlier today that when the draft language is -- rule
25 language is issued for comment, the Reg Guides come out

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1 final? So there's no comment period?

2 Tim, what is that?

3 MR. REED: No, the Draft Guides come out
4 final.

5 MR. KRAFT: I thought so.

6 MR. REED: The Draft Guides go from
7 proposed rule to final.

8 MR. KRAFT: That makes sense. I thought
9 I read somewhere in one of these slides that it would
10 be the -- maybe it the Final Draft Guide. Maybe that's
11 what that meant. That would be fine.

12 MEMBER BLEY: Steve, before you pick up
13 all your stuff, if I understood you right, the reason
14 all or many have gone to these radar systems for 5
15 million bucks, for God's sake, is they don't want any
16 penetrations and they don't want any equipment dangling
17 in the pool.

18 MR. KRAFT: They don't want a penetration
19 or an attachment to the pool liner. Dangling over the
20 pool you get stuck with when you do this -- by the way,
21 I should say so I'm not misrepresenting and I don't get
22 vendor calls tomorrow, the vendor prices costs are not
23 that 5 million. It's the total job, 2 to 5 million.
24 And I know you have some experience there.

25 MR. BUNT: Great. But it turns out that

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1 when you look at all the criteria and all the conditions
2 that have been applied through the negotiations and
3 getting to the 12-02 Guidance Document, that to comply
4 with that, the simple changes were not acceptable.
5 They had components that would not give you the results
6 that you were wanting. The bubblers were not
7 acceptable when you looked at it.

8 MEMBER BROWN: But the accuracy of these
9 was like plus or minus three feet or some God awful,
10 terrible number. I mean, you could barely tell any
11 concept of whether there was water in the pool or not.
12 It could almost be drained before you knew it.

13 MR. KRAFT: Well, in fact I thought it was
14 the opinion of the Committee in our verbal exchanges
15 back two-and-a-half, three years ago, because the
16 guidance and the order said you can do three discrete
17 points and lights. Well, you can't buy level
18 technology like that anymore. It's all continuous.
19 So it's all continuous, so we did --

20 MEMBER BLEY: That's why we were saying
21 why in the world are we specifying it that way? I guess
22 the train has already left the station on this stuff,
23 but some of the simpler stuff, although you might have
24 something in the pool, if you have no DC or AC control
25 power, or whatever is powering these systems, you could

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1 still hook something up and get a reading, where with
2 this radar thing you --

3 (Simultaneous speaking)

4 MR. KRAFT: No, there's battery backup.
5 Have to have battery backup for each --

6 MR. BUNT: They install battery backup --

7 MEMBER BLEY: Will do it? Okay.

8 MR. BUNT: -- that has it. And then you
9 have to have a second power source to it. That was also
10 part of the criteria. And we chose the large span in
11 the instrumentation because of the functionality in the
12 slow-moving event that would be demonstrated by this.
13 Basically it said when you're within the normal level
14 and 10 feet above the pool, you wanted to have fairly
15 reasonable accuracy. But then once you get past that
16 you, you really just want to know am I -- is the water
17 makeup I'm doing making progress? Is it going into the
18 pool and not going out a hole, or is it going to a hole?
19 So that's why that longer duration or bigger span was
20 when you got closer to the fuel.

21 MEMBER BLEY: I think we probably
22 understood that, but we were thinking almost anything
23 you can get will do a lot better than that.

24 MR. BUNT: Correct.

25 MEMBER BLEY: You'd almost have to degrade

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1 something to get that kind of --

2 MEMBER BROWN: And also, there was like
3 one foot when you got down close to the top of the -- no
4 --

5 (Simultaneous speaking)

6 MR. KRAFT: It got closer. It was more --

7 MR. BUNT: One foot for the first --

8 MEMBER STETKAR: It's one foot between
9 what they call Level 1 and Level 2, and then 32 over
10 the remaining 10 feet above the top of the --

11 MEMBER BROWN: Well, at the top it was a
12 much wider band. As you got closer to the top of the
13 fuel, it got tighter.

14 MEMBER STETKAR: No, it's exactly
15 opposite.

16 MEMBER BROWN: Yes, and I thought that was
17 idiocy, but that's okay also.

18 MR. KRAFT: Well, because you're going to
19 start putting water in long before that point.

20 The other thing that's worth mentioning;
21 and this is a piece of confusion that a lot of people
22 have in our industry as well, is that the Spent Fuel
23 Pool Instrumentation Order was not about adding water
24 to the pool. It was about telling the decision makers
25 whether you could ignore the pool or how to do something

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1 with it. The fact that that same signal is informing
2 mitigating strategies, whether you should turn a pump
3 on or not, is not covered by this order. It's a
4 different question. And again, words are important.
5 That drives different requirements into different
6 locations that we always get confused about. So I
7 thought I'd just point that out, that it is really for
8 a different purpose. If it was meant just to tell you
9 level in the pool, it would have included mitigating
10 strategies in the first place. And it wasn't.

11 MR. BUNT: And the reason that we did have
12 the tie to the top was because it was for the decision
13 makers so that you could determine is it really blow-off
14 or is it a leak and a hole? So you need that early
15 -- once you get to within 10 feet, it's like I already
16 know that it's going faster and I need to put water back
17 in. So I'm really just looking -- am I putting water
18 in as fast as I'm losing it, or not? And that's why
19 the bigger gap at the bottom.

20 MEMBER STETKAR: Do you, Steve -- and I
21 know that you have to be careful about the designs, but
22 I would assume that the designs that are actually being
23 installed has the same resolution over the entire span,
24 or are they actually tuned somehow to have different
25 resolutions?

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1 MR. KRAFT: No, no, my understanding they
2 have the same resolution.

3 MR. BUNT: They have the same resolution,
4 however, some of them as the water level changes and
5 all, the resolution is going to change also because of
6 the functionality of it. So you are going to have some
7 difference in the calibration capability as it changes.

8

9 MEMBER STETKAR: Okay.

10 MR. BUNT: So that's part of it. But it's
11 still much more refined than what's required.

12 MEMBER STETKAR: Yes, I was going to say
13 I don't want to split hairs on the technology, but it's
14 not the difference between an inch in one case and 12
15 feet in the other case.

16 MR. BUNT: Correct.

17 MEMBER STETKAR: Okay.

18 MR. BUNT: And we wrote the guidance early
19 on because we weren't sure if there wouldn't be a simple
20 float solution that might pass, a bubbler solution.
21 But it turned out that for all the criteria we had with
22 all the seismic and all the hydrology and everything
23 else that it looked like that was the one that was
24 driving more of the cost than the actual technology
25 itself.

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1 MR. KRAFT: One unit did a small test with
2 a bubbler. And it was a PWR unit. And what happens
3 is that the bubbler size is small enough that you played
4 out the boron in the spent fuel pool and it clogs it
5 up. So something really simple kind of got taken out
6 of consideration. A lot of plants like bubblers.
7 They're very used to them and really a good solution.

8 MEMBER BROWN: It plays up the boron?

9 MR. KRAFT: Yes, and it clogs up the little
10 tubes.

11 MEMBER BLEY: No, it would do that. I
12 mean, they use them a lot in chemical plants, but they
13 work fine there if you don't have something that will
14 play out.

15 MR. KRAFT: One unit did a test and that's
16 what they discovered. And that OE went around the
17 industry so people would stop looking at bubbles.

18 CHAIRMAN SCHULTZ: Other comments or
19 questions from the Committee for the industry?

20 (No audible response)

21 CHAIRMAN SCHULTZ: We're going to hold the
22 staff presentation on this topic until after a break.
23 I'd like to take a break now. Off the record until
24 3:25.

25 (Whereupon, the above-entitled matter

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1 went off the record at 3:10 p.m. and resumed at 3:26
2 p.m.)

3 CHAIRMAN SCHULTZ: We'll come back on the
4 record with the staff presentation. Eric Bowman is
5 going to make that presentation.

6 MR. BOWMAN: Thank you. This is Eric
7 Bowman again, Special Adviser in the Japan Lessons
8 Learned Division for those of you that don't know me.
9 I'll be discussing the draft regulatory guidance on the
10 wide-range spent fuel pool level instrumentation.

11 In this draft guide we propose to endorse
12 NEI 12-02 Revision 1 as was done earlier in JLD Interim
13 Staff Guidance 2012-03.

14 The current status of it is that we have
15 a draft of the draft reg guide that we finalized and
16 published in conjunction with the publication of the
17 proposed rulemaking package.

18 The SECY number for the proposed
19 rulemaking package is SECY-15-0065. It was delivered
20 to the Commission on the 30th of April. It should be
21 made public in about another week or so.

22 Our intention with the Draft Guide 1317 is
23 to carry forward exactly the same clarifications that
24 were made in the interim staff guidance.

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1 We've heard NEI's and industry's comments
2 on our staff positions in the draft guide as it compared
3 to the interim staff guidance. And we'll take a look
4 at that and see if it needs to be adjusted prior to
5 publication.

6 CHAIRMAN SCHULTZ: Prior to publication
7 as the final draft.

8 MR. BOWMAN: As the draft guide. The
9 other two reg guides that we discussed here wouldn't
10 be final regulatory guide until the actual publication
11 of the final draft guide.

12 CHAIRMAN SCHULTZ: Right. Okay.

13 MR. BOWMAN: So that really concludes my
14 discussion unless you have any questions.

15 CHAIRMAN SCHULTZ: No more detail than
16 that. You enjoyed the break.

17 MR. BOWMAN: I did.

18 (Laughter)

19 CHAIRMAN SCHULTZ: I want to call on Tim
20 Reed just to assure that -- what we said about this draft
21 guide, it is the same for the others in terms of how
22 the guides are going to move forward.

23 So, just thinking about whether the
24 committee, the full committee would have the

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1 opportunity to comment on the draft, on the guides.

2 We could comment now. We also have full
3 opportunity to comment on the -- for the final draft
4 rule.

5 So, could you comment on that? Just
6 reaffirm that.

7 MR. REED: Yes. As Eric said and it's
8 mentioned a couple of times today. The QFS regulation
9 process is to publish draft guidance with a proposed
10 rule, final guidance with a final rule.

11 That's what we're trying to do here. So,
12 we're trying to get a complete set of draft guidance
13 out with the proposed rule.

14 It's a little different than the proposed
15 rule because the proposed rule as you all know is now
16 with the Commission. That's something the Commission
17 deliberates on.

18 The draft guidance is made available to
19 them. But the real process thing is to put the draft
20 guidance out with the proposed rule.

21 So now we have to try to time it if you will
22 given we have a Commission on July 9. We're trying to
23 figure out when we get that SRM, how long it takes us
24 to revise the package, get it to the Federal Register.

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1 That becomes a date if you will when I want
2 to get all this draft guidance together at the same time
3 so it goes out for comment.

4 And the committee has the opportunity of
5 course, as well as everyone else, to comment throughout
6 that process and into the final rule if you like. So,
7 that's the goal here. Put out the draft guidance.

8
9 And I think it was Eric mentioned earlier,
10 the whole intent here is to ensure that there's
11 sufficient information to support the entire proposed
12 regulatory framework so the stakeholders understand
13 both -- we understand what we think is a simple way to
14 comply with the rule, but also it tells you something
15 about the rule provisions themselves.

16 And they really work back and forth. You
17 get an opportunity to if you will resolve
18 discontinuities between the proposed requirements and
19 guidance that sometimes happen in proposed rules. So
20 that's the idea.

21 So we're trying to follow our practice to
22 the maximum extent possible. I think you're well aware
23 we have some challenges in some of the reevaluated
24 hazard guidance that we're trying to address.

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1 CHAIRMAN SCHULTZ: Okay, thank you very
2 much for the clarification.

3 MR. REED: Sure.

4 CHAIRMAN SCHULTZ: Well, the information
5 and the clarification. I heard both. Thank you.

6 Any other comments or questions for Eric
7 from members of the committee?

8 (No response)

9 CHAIRMAN SCHULTZ: So we'll make a quick
10 change-out again. While you move from the table, Eric,
11 and NEI comes up for the next discussion, just a
12 reminder that we are shifting gears here now and moving
13 away from the rule related to mitigating strategies and
14 onto a discussion related to containment venting,
15 hardened containment venting.

16 Again, as I mentioned in the introduction
17 this morning, we wanted to hear from the industry and
18 from the staff the information related to this topic.

19 And specifically -- Steve, you can move
20 right up while Eric moves out.

21 When we met last the subcommittee heard a
22 briefing from industry and from the staff. The full
23 committee did as well.

24 We did not have available at that time the

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1 final versions of the documentation that was produced
2 as a result of those discussions. And so we wanted to
3 have the opportunity to meet today and learn, having
4 seen the final documentation learn from industry and
5 from the staff were there any changes, any additional
6 information that ought to be presented to the
7 committee. And we wanted to have the opportunity for
8 this, again, more detailed interaction.

9 So with that I'll turn the discussion to
10 and introductions over to Steve Kraft from NEI.

11 MR. KRAFT: Well thank you, Mr. Chairman.
12 Once again, we liked it so much 10 minutes ago we came
13 back for more. My friends were jealous so I brought
14 them with me this time.

15 Again, we are shifting to a discussion of
16 the vent water guidance not included in the mitigating
17 strategies rulemaking which just to clarify for our
18 understanding.

19 I'm accompanied by people you have met
20 before. This is Phil Amway from Exelon. Phil will
21 take the primary lead in our presentation.

22 Phil as you know is the primary author of
23 NEI 13-02 Rev 1.

24 Jeff Gabor from ERIN Engineering and Randy

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1 Bunt from Southern. You've met these folks before.

2 I just would like to compliment the
3 committee. When we came back from lunch we were two
4 hours behind schedule. We are now not even a half hour
5 behind schedule. So I'm happy to report that we are
6 moving along.

7 CHAIRMAN SCHULTZ: Let's try to work on
8 that a little bit.

9 MR. KRAFT: Since Dr. Powers said that I
10 should remind everyone that at 7:30 this evening the
11 puck will drop on Game 4 between the Capitals and the
12 Rangers, and I am going to be home in front of my
13 television set watching that.

14 CHAIRMAN SCHULTZ: All right. Well,
15 that's up to you to keep us on schedule.

16 MR. KRAFT: Absolutely.

17 MR. AMWAY: Okay. So, really the focus of
18 our presentation today is to update you on changes made
19 to NEI 13-02 since last time we met on April 10.

20 During that last meeting we went through
21 a number of changes to bridge the gap from draft 0E2
22 which is the original draft that you saw, to 0F4.

23 And then there were some additional
24 changes made from 0F4 to Rev 1.

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1 The progress that has been made since then.
2 ISG-JLD-2015-01 was issued on April 30. We also issued
3 13-02 Rev 1 on April 23 in support of the issue of the
4 ISG. That draft, or that revision now, not a draft,
5 resolved the remaining NRC staff, ACRS and stakeholder
6 comments.

7 And in the ISG there are no technical
8 exceptions. There are some exceptions and
9 clarifications, but none that will impact the technical
10 implementation of the guidance contained in 13-02 Rev
11 1.

12 Some changes that we did make since the
13 last time we met was we strengthened our discussion on
14 the RPV addition point as the preferred source of water
15 addition for SAWA strategies.

16 The goal there, or the rationale for that
17 is that the RPV addition point reduces the impact of
18 the uncertainties related to core relocation. We had
19 discussed in the last meeting the potential that not
20 all the core debris exits the reactor vessel. Some of
21 it may hang up on components and structures between the
22 bottom of the reactor vessel and the drywell floor. So
23 we made a modification to that discussion and we'll see
24 that in the next slide.

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1 OIP templates, they will contain
2 plant-specific details related to Phase II
3 implementation. The specific details that we'll
4 include in that OIP include such plant-specific details
5 as spillover height, the freeboard volume and the water
6 addition rate. The water addition rate, we had the
7 generic values 500 gpm, 100 gpm reduced over time and
8 we had the clarifications in there for plants that have
9 RCIC systems, designed flow rates less than 600 gpm that
10 we can use the 400 or 450 gpm that those plants are
11 rated for, or the process of ratioing and scaling the
12 flow rates based on a comparison of the plant that's
13 implementing to the reference plant power level that
14 was used in the generic guidance.

15 In terms of the EPRI technical assessments
16 we just wanted to point out that the EPRI technical
17 assessments supporting the CPRR rulemaking effort do
18 not credit drywell sprays in terms of release
19 reduction.

20 The use of drywell sprays is contained in
21 the SAMGs where that's applicable and appropriate using
22 sources that are not required for the RPV injection.

23 So, I mean just going back to our
24 discussions this morning on procedures integration,

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1 the SAMGs provide a set of response actions to plant
2 events that are symptom-based, and that there are water
3 addition sources that are available to do containment
4 spray functions. They would be considered in addition
5 to whatever water addition sources we are using to
6 implement the SAWA/SAWM strategies.

7 The SAMGs when in that case limit the use
8 of sources outside the containment because the
9 philosophy of the SAWA/SAWM strategies is to preserve
10 that wetwell vent path. So if we're doing water
11 addition sources from external to the containment
12 you're actually raising or contributing to raising that
13 water level inside your containment and result in a loss
14 of that wetwell vent sooner.

15 Before I move on to the next slide, Jeff,
16 is there anything else you wanted to add on this
17 particular one?

18 MR. GABOR: No, I don't have additional.

19 MR. AMWAY: Okay, very good. For the
20 specific change that we made dealing with the RPV as
21 the preferred addition source what I have in there is
22 -- starting at limits the impact of modeling. That's
23 the actual bulleted item that was added, but it's under
24 the header of RPV water addition as the preferred

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1 addition source.

2 And that's where we added the text that it
3 limits the impact of the modeling uncertainties. So
4 that is actually contained in the guidance in 13-02 Rev
5 1.

6 This is the other change that was made. We
7 added this up front in Section 1.2, the concern being
8 that our analysis shows that we can protect the
9 containment even if we delay water addition for up to
10 8 hours.

11 The concern being is, well, why would we
12 wait 8 hours. Why wouldn't we put the water addition
13 in as soon as possible. And in effect that's what our
14 procedures would drive us to do.

15 But we want to make it clear for the
16 designers that are looking at implementing SAWA/SAWM
17 that they do look and consider in their designs the
18 early deployment of portable equipment used to support
19 SAWA/SAWM.

20 Obviously the sooner you can get water
21 added the better off your plant response is going to
22 be and the sooner you can stabilize and arrest the core
23 melt progression.

24 So we did add some guidance up in the front

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1 to do those considerations. We will make sure that we
2 reinforce that at the industry workshops coming up for
3 those plant workshops for helping the licensees
4 implement Phase II in their Phase II OIPs.

5 In terms of endorsement and NEI 13-02 we
6 don't see any technical concerns with developing the
7 Phase II OIP. We can use the guidance in 13-02 Rev 1
8 to implement the entire order that's both Phase I and
9 Phase II.

10 The sections that weren't endorsed, we'll
11 still use them as the industry. We feel that those are
12 important, particularly in the area of the Generic
13 Letter 89-16 commitment guidance. Because for the
14 plants that are committed to 89-16 the requirements of
15 the order certainly satisfy the requirements we did
16 under Generic Letter 89-16 --

17 MEMBER BLEY: Remind me about 89-16.

18 MR. AMWAY: 89-16 was earlier guidance for
19 putting in a hardened vent.

20 MEMBER BLEY: And it had issues.

21 MR. AMWAY: It certainly wasn't severe
22 accidents. The way I see it, you know, it's a hardened
23 vent. It's not severe accident-capable. All the
24 requirements that are outlined in the order and

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1 implemented through 13-02 would do everything that
2 Generic Letter 89-16 would require and more.

3 So those are just steps for licensees
4 through how to change their commitments from an 89-16
5 vent to an Order EA-13-109 vent.

6 MEMBER BLEY: Not to beat a dead horse, but
7 this reminds me of our conversation in the last session.

8 I mean, years ago we said just put in a
9 hardened vent. But the reason we put it in was to deal
10 with severe accidents, to prevent them and also -- and
11 we didn't do that at the time.

12 And that's why this stuff we were talking
13 about, adding a machine that just looks like the other
14 machines, eventually that's going to come back to bite
15 us and cost us more. That's all.

16 MR. KRAFT: I'd have to go back and reread
17 that letter about how the comparison between the
18 requirements and the language. And also this was a
19 voluntary matter that got turned into a Generic Letter
20 so that is a different process to get there.

21 So the issue here is not the value of the
22 89-16 vent. The issue here is that we had actually
23 asked NRC to rescind that requirement and they said no,
24 we've never reviewed that.

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1 So we had to offer a way through the
2 regulatory steps you have to go through to get one
3 commitment to convert it to the other.

4 Otherwise, we don't know what you'd end up
5 in terms of inspection space. So it goes back to that
6 problem you were talking about before.

7 MR. AMWAY: And lastly, the EPG SAG
8 information. We certainly feel that that's important
9 to have that background information for the licensees
10 to review and consider.

11 Because we are going to have to procedures
12 to implement SAWA/SAWM. That's going to be primarily
13 done through changes to the SAMGs.

14 In terms of our next steps we will develop
15 an industry template for Phase II similarly to how we
16 did for Phase I. We do plan to conduct pilot plan
17 development of the Phase II OIP. That will occur over
18 the course of the summer.

19 We'll wrap that up with our workshop in the
20 September time frame. That'll give October, November
21 for the individual licensees to develop their own
22 site-specific OIPs in preparation to submit the OIPs
23 by December 31 of this year.

24 CHAIRMAN SCHULTZ: Phil, is there a

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1 schedule for the workshop yet?

2 MR. KRAFT: We are contemplating
3 September or early October to do that. It has to be
4 scheduled in with the BWR Owners Group meetings through
5 that same period.

6 But it would be in the
7 Washington-Baltimore area. I think Weidong attended
8 the last few so we'd expect attendance as well.

9 MR. AMWAY: In closing the work that's
10 been done in NEI 13-02 Rev 1 and the supporting ISG,
11 that reflects a significant work effort on the part of
12 the NRC staff and the industry to provide the guidance
13 necessary to implement Phase II of the order.

14 And we are at a point now where I think
15 we're ready to take that to the individual sites and
16 get ready for implementation.

17 MEMBER STETKAR: Before you get
18 comfortable I've got two or three questions that I had.

19 I actually did compare them side by side
20 so there are more changes than you highlighted.

21 In Rev 1 Section 4.1.1.2.3 there's a
22 discussion about if you have a plant where you don't
23 want to install let's say the 500 gpm makeup capacity,
24 the nominal makeup capacity.

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1 It used to say that SAWA capacity less than
2 specified in 4.1.1.2.1 or 4.1.1.2.2 should be supported
3 by plant-specific analysis demonstrating containment
4 temperature can be maintained at or below 545 degrees
5 Fahrenheit.

6 And I understand what that means. To me
7 that says -- I don't do these things, but I understand
8 some sort of analysis.

9 And now it says SAWA capacity less than
10 that specified in 4.1.1.2.1 or 4.1.1.2.2 should be
11 supported by plant-specific design, i.e., SAWA flow
12 rate determined by scaling, a ratio of the plant thermal
13 power rating over the reference plant power multiplied
14 by 500 gpm. That's a linear scaling. It also appears
15 when you have the 100 gpm minimum flow rate.

16 And my question was, because I don't do the
17 thermal hydraulic stuff. Other folks do. Is are we
18 sure that a simple minimum scaling to say, well, instead
19 of having 3,000 megawatts thermal I have 2,000
20 megawatts thermal, that two-thirds times 500 gpm is
21 good.

22 Corradini is nodding his head it's okay.
23 Okay. I didn't know why it was necessary to insert that
24 simplification in there instead of saying do an

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1 analysis. There must have been some justification for
2 it.

3 MR. AMWAY: And the reason why we did that.
4 I mean, it would have certainly been acceptable to say
5 in there you can do site-specific analysis. And a site
6 can still do that.

7 What we were trying to do was to simplify
8 it, understanding that there are much smaller BWRs with
9 much smaller core sizes. And instead of having them
10 to go figure out how to do their site-specific map
11 analysis, determine the flow rates required, we could
12 simply do the scaling. We know what the thermal power
13 rating of the plant is and what the reference plant was.
14 And you can just do a simple hand calc instead of a map
15 analysis.

16 MEMBER STETKAR: I get the philosophy.
17 Because I don't do these analyses myself. Corradini
18 is sitting over there hammering on little calculators.

19 MR. GABOR: Let me add, there's one
20 element to it that's in the very recently released EPRI
21 technical report for CPRR.

22 And that is the ratio of the power to the
23 containment volume. And it turns out that for our
24 reference plant that was the highest power to

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1 containment volume ratio of all the plants.

2 MEMBER STETKAR: That also helps me.
3 Thanks.

4 MEMBER CORRADINI: But if I might just go
5 back. I remember I tried this -- since you identified
6 me -- the 500 gpm is well over shutdown decay heat.

7 MR. GABOR: Yes, it is.

8 MEMBER STETKAR: Oh yes.

9 MEMBER CORRADINI: So then given that the
10 scaling seems what you would try to do instead of hold
11 it.

12 There was something else though that I
13 wanted to go back to in slide 3 which is -- could you
14 explain to me -- so you point out staff's assessments
15 supporting -- did not credit drywell sprays for release
16 reduction.

17 Use of drywell sprays is considered in the
18 SAMGs sources not required by RPV injection. So not
19 the 500 gallons per minute?

20 MR. AMWAY: Yes, it would be a separate
21 source. And we're -- and I don't want to mix up,
22 because we are so tight in Phase II with the rulemaking.
23 But there's a distinction between what Phase II of the
24 order is doing and what the rulemaking is doing.

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1 We're trying to prevent containment
2 overpressure-related failures as part of the order
3 where the rule is containment protection release
4 reduction.

5 So, in no case are we trying to look at
6 drywell sprays as part of the order as a means of release
7 reduction. It would certainly be an alternate -- it
8 would only be an alternate path for SAWA addition that
9 if you for some reason can't go to the RPV you would
10 go to the drywell.

11 MR. BUNT: The comment here -- this is
12 Randy Bunt -- is that because we're preserving the
13 wetwell vent for as long as we can that if we brought
14 in a large volume of water through sprays that would
15 counteract that method.

16 But if you're doing a circulation inside
17 containment pulling from the suppression pool and
18 discharging through the sprays and that's the benefit
19 internal --

20 MEMBER CORRADINI: That's the method
21 you're thinking of?

22 MR. BUNT: Correct.

23 MEMBER CORRADINI: Okay.

24 MR. BUNT: So that would be the thing that

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1 would not be an external source, but you would still
2 get some benefit from the spray functionality of that
3 -- have that capability for our core spray or some other
4 function.

5 MEMBER CORRADINI: Okay.

6 MR. AMWAY: We are working on changes to
7 the SAMGs. I mean, because you can't get there with
8 today's SAMGs with what we want to do with SAWA/SAWM.

9 MEMBER CORRADINI: So let me ask a
10 question that was going to be to the comment period at
11 the end of the day but I'll ask it now.

12 MR. AMWAY: Okay.

13 MEMBER CORRADINI: Would it benefit the
14 committee to understand all this via some sort of
15 tabletop demonstration to us? So we get a feeling of
16 how you guys have figured out integration and we just
17 don't -- may not get it?

18 I'm trying to look at some sort of
19 demonstration at least in my mind so I understand how
20 all these things integrate relative to a what-if.

21 MR. KRAFT: So, Dr. Corradini, we would
22 never suggest the committee doesn't get anything.

23 MEMBER CORRADINI: Well, that's very kind
24 of you, but let's just say this member sometimes gets

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1 confused relative to all the procedures we talked about
2 earlier today and this one, and how they all fit
3 together.

4 MR. KRAFT: We are actually thinking about
5 that. We've been talking -- early today we had a
6 private conversation with folks from Exelon. We think
7 we can work something out.

8 I will tell you in advance it has to be a
9 closed meeting. And the reason for that is that there
10 will be about showing you certain products that are only
11 available to certain people because of the way the
12 owners groups operate.

13 MEMBER CORRADINI: That's fine. I
14 understand.

15 But I guess that I'm getting a little bit
16 ahead. But the reason I kind of went back to this is
17 we had brought it up when you guys were last here.

18 And I just don't -- sometimes I can't put
19 this piece together with this piece. And it seems like
20 some sort of demonstration or talking it through with
21 us so we can ask questions as you go through the
22 demonstration to me would be very helpful.

23 MR. KRAFT: We thought a tabletop in this
24 room using creative use of the screens behind us might

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1 be valuable.

2 MEMBER CORRADINI: All right. Thank you.

3 MEMBER STETKAR: We have, by the way, in
4 terms of logistics for subcommittees there's no problem
5 closing those. We can even close a full committee
6 meeting.

7 We tend not to like to close full committee
8 meetings, but because the subcommittee is nominally a
9 committee of the whole anyway that's not an issue.

10 MR. KRAFT: Very well. We'll work with
11 your staff on putting something together.

12 MR. AMWAY: Any other questions?

13 MEMBER STETKAR: I had one little nit. In
14 fact, I'm not even going to bring that up. That's a
15 nit.

16 But you're still okay. It's an issue I
17 raised during the previous meeting about confirming the
18 fact that you have SAWA flow by remote valve position
19 indication rather than active confirmation of flow
20 either through a flow rate or change in level.

21 You didn't change the guidance in that.
22 The guidance still says that the remote valve position
23 indication is a way to confirm it. And as an
24 alternative you could actually measure flow rate or

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1 change in level.

2 MR. AMWAY: Yes, we -- I guess we talked
3 about that quite at length. And --

4 MEMBER STETKAR: I just -- I mean, it's
5 something you did not change, and I just wanted to make
6 sure.

7 MR. AMWAY: We don't want to get overly
8 hung up on a single indication that we got SAWA flow
9 where we want it.

10 I mean, we're looking at having
11 instrumentation in the flow path that directly measures
12 flow from the pump we use for SAWA, the remote position
13 indication, the containment water level response.
14 There's a variety of indications that we need to use.

15 MEMBER STETKAR: Except for the fact --
16 I'll bring it back to the fact that people look at each
17 one of these words and hang on each one of them.

18 The quote is, "Verification of a
19 functioning SAWA flow path can be obtained from local
20 or remote valve position indication in the main control
21 room remote operating station or some other severe
22 accident evaluated location for remote-operated
23 valves." Period.

24 "As an acceptable alternative approach is

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1 using a combination of indicated pump flow and changing
2 containment pressure and/or suppression pool level for
3 validation of an open SAWA flow path."

4 So if I as a professional skeptic read
5 those words it says all I need is remote valve position
6 indication. It doesn't say what you said orally.

7 What you said orally is the combination of
8 the two, but not in the sense of an acceptable
9 alternative as all of the other stuff you mentioned.

10 MR. BUNT: The reason we put it in that
11 order, or one of the reasons we put it in that order
12 was that the other is an indirect measure by measuring
13 suppression pool level. And also because that's the
14 required instrument and that's going to be in the
15 guidance to measure that level.

16 We wanted to say that we prefer you to have
17 the other indications because you're going to have
18 level.

19 So the real distinction here is the local
20 flow rate out of the pump versus the indication of the
21 valve's opening and valve positions.

22 But we are going to be measuring
23 suppression pool level changes which will give us an
24 indication of the water flow and also the pressure

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1 inside containment.

2 MEMBER STETKAR: For someone who once had
3 a manager at a nuclear power plant call me from an
4 overseas location and apologize because he never
5 realized that a valve indicating open could in fact be
6 closed I'll note that valve position indication is
7 probably the least reliable of everything that you
8 mentioned.

9 And indeed, it's listed as the primary
10 source.

11 MR. BUNT: Understood.

12 CHAIRMAN SCHULTZ: I think the comments
13 are quite valid. And I'll just go back to what we
14 discussed last, and that was the simple scaling
15 approach associated with determining how one might
16 evaluate a flow rate for other units.

17 And my first reaction to that was, well,
18 why is that acceptable. And two reasons were provided
19 as to why that was acceptable. And then I felt very
20 good about it.

21 But what still concerns me is the same type
22 of thing that John is saying and that is could someone
23 read what is provided here and presume that this type
24 of simple evaluation might be applied in other areas

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1 where you're trying to decide what would be suitable
2 for a smaller plant and go off and calculate something
3 wrong without understanding that there are reasons why
4 this is acceptable for this particular application.

5 You just have to be very careful how things
6 are presented and how they might be interpreted.

7 Now, you're going to have workshops,
8 you're going to have discussions with industry and
9 making the application plant-specific. But I'd just
10 caution that those are very important discussions.

11 MR. AMWAY: I agree. And I think to
12 address the condition and verification of SAWA flow we
13 tend to take that into consideration as we develop the
14 industry template to make sure that we're getting plans
15 that consider the other options as well.

16 Because there's another section in there
17 that says we have to evaluate the logic of the valves
18 to make sure that they'll -- to make sure that it's not
19 getting inadvertently diverted from another flow path
20 within the system. So that would help as well.

21 But I certainly take the point that we need
22 to look at our containment response as well.

23 And the overall integrated plans would
24 also have some guidance on what the language and the

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1 procedures are going to be.

2 And our current thinking right now is that
3 that will be monitoring the flow rates from a standpoint
4 of looking at containment pressure and suppression pool
5 level as a functionality about them.

6 CHAIRMAN SCHULTZ: Other comments from
7 the committee?

8 All right. We'll then move to the staff
9 presentation on the topic. Raj, welcome.

10 DR. AULUCK: Good afternoon, my name is
11 Raj Auluck. I'm an NRC project manager in the Japan
12 lessons learned project division within the Office of
13 Nuclear Reactor Regulation.

14 With me today at the table are senior
15 technical staff members from NRR, Mr. Nag Karipineni,
16 William Beckley and from Office of Research Dr. Hossein
17 Esmaili.

18 In addition, staff members from NRR and
19 Office of Research who participated in the development
20 of this interim staff guidance are also present in the
21 audience and they are available to respond to any of
22 your questions.

23 The focus of today's briefing is to respond
24 to the ACRS member questions raised at the April 10 full

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1 committee meeting, and on the recommendations and
2 concerns noted in the ACRS letter of April 30, 2015.

3 Before we begin our presentation I will
4 very briefly go over the status and schedule for the
5 subcommittee's benefit.

6 As you know, NRC Order 13-109 was issued
7 in June 2013 and allowed implementation in two phases.
8 Phase I includes upgrading the venting capability from
9 the containment bedwell to provide a desirable severe
10 accident-capable hardened vent.

11 And Phase II includes installation of a
12 reliable severe accident-capable drywell vent system
13 or development of an alternate reliable containment
14 venting strategy that will make it unlikely that we will
15 need to vent from the containment drywell.

16 The implementation phases were also
17 different. For the first phase it was the second
18 refueling outage that begins after June 30, 2014, or
19 June 30, 2018, whichever comes first.

20 And for Phase II no later than startup from
21 the first refueling outage after June 30, 2017, or June
22 30, 2019, whichever comes first.

23 As more for the background, the ISG for
24 Phase I was issued in November 2013. All overall

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1 engineering plans were submitted by June 30, 2014 as
2 required by the order. The staff has also issues the
3 interim staff evaluations in all of them.

4 As on this slide, this talks about the
5 Phase II development, the ISG. The draft ISG was
6 issued for public comment on March 10, 2015. And it
7 reflected the information provided in the NEI guidance
8 13-02, the Revision 0E2.

9 The ACRS subcommittee was briefed on March
10 30, 2015 where the staff also provided some updated
11 information as a result of further discussions with
12 industry held at the March 16 public meeting.

13 It was close to the subcommittee meeting.
14 The meeting was originally scheduled much earlier but
15 had to be postponed because of the snowstorm.

16 The public comment period ended on April
17 9. There were only two comments received. The ACRS
18 was briefed, the full committee was briefed on April
19 10, 2015.

20 Based on the comments received at that time
21 the NEI submitted the advice to Revision 1 of NEI 13-02
22 for staff endorsement on April 23.

23 This revision includes resolution of
24 staff's concerns and comments.

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1 The Phase II ISG was completed and approved
2 for publication on April 29 and is expected to be --
3 is scheduled to be noticed tomorrow in the Federal
4 Register notice.

5 And the next bullet is the containment
6 protection and release reduction we're making a
7 regulatory basis expected to be issued for public
8 comment towards the end of this month.

9 And the scheduled date for ACRS
10 subcommittee briefing is June 25, 2015.

11 As a last note, Phase II overall integrated
12 plan submitted by December 31, 2015.

13 With these comments I will introduce Nag
14 Karipineni who is a senior reactor systems engineer in
15 the containment and ventilation branch in NRR to start
16 the presentation on the technical side.

17 MR. KARIPINENI: Thank you. Since the
18 issuance of Phase I of the ISG what we have done is to
19 the NEI guidance add some FAQs and white papers. A
20 significant amount of them is the white paper on the
21 calculation of doses to the operators and the
22 conventional gas control to the pipe.

23 The focus has been on the severe accident
24 water addition and severe accident water management in

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1 Appendices I and C, respectively.

2 The guidance for the drywell vent itself
3 basically follows the guidance for the wetwell vent.
4 So there's not a difference there in that regard, the
5 temperature's still the same --

6 MEMBER CORRADINI: Can you speak louder,
7 please?

8 CHAIRMAN SCHULTZ: Is the mike on?

9 MR. KARIPINENI: Thank you. Go to the
10 next slide. Slide number 4. This slide we are showing
11 you before is the temperatures in the containment with
12 no water addition.

13 As you can see, the temperature goes up to
14 2,500 degrees Fahrenheit in the pedestal region. And
15 as the levels go up in the drywell the temperatures vary
16 from 1,000 to 1,500 degrees here.

17 What we have not presented is the next
18 slide before to you which is the drywell temperatures
19 for a Mark 2 containment analysis we have done.

20 And here also the pedestal region is as
21 high as 2,500 degrees. However, the lower regions sort
22 of vary from 500 to 800 degrees. And my understanding
23 is it's because of the bigger volume that those
24 temperatures are lower.

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1 In any case, this is what we call the model
2 1 drywell vent.

3 MEMBER POWERS: I'm a little unclear about
4 a couple of things. There's not a part of the Mark 2
5 that I'm familiar with that makes the distinction
6 between lower and upper. So I don't know where the
7 bound. I mean, I just don't know where you're
8 calculating here.

9 DR. ESMAILI: We have some backup slides
10 if you want.

11 MEMBER POWERS: I mean, just tell me.

12 DR. ESMAILI: Okay, so this is the upper
13 reactor pedestal, this is right below the reactor. Up
14 until the, you know, where the -- right there.

15 MEMBER POWERS: Okay. Above the
16 operational flow.

17 DR. ESMAILI: Here is the reactor. Here
18 is the lower reactor. So, one is the drywell pedestal.
19 One is the wetwell pedestal.

20 MEMBER POWERS: Okay. So this is a
21 calculation like for LaSalle or something like that.

22 DR. ESMAILI: For LaSalle.

23 MEMBER POWERS: But not Susquehanna.

24 DR. ESMAILI: Yes. But we have done some

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1 sensitivities later on that we feel that would work.

2 MEMBER POWERS: I just didn't understand
3 that.

4 And then I noticed for the upper reactor's
5 pedestal you've got a bunch of spikes in the temperature
6 here that don't correspond -- there's no corresponding
7 spike anywhere else. So there's something special
8 going on here.

9 DR. ESMAILI: There are different flow
10 paths, Dr. Powers. There are, you know, at that point
11 the drain line has failed so there is an opening between
12 the upper and the lower reactor pedestal.

13 There's also flow going through the --
14 between the lower reactor pedestal and the wetwell
15 volume. And these are very, very small volumes.

16 So, what you see here is that there are
17 changes of the flow. Reversal of the flow between
18 these volumes can change the temperatures inside these
19 regions.

20 Most of the debris, of course, is sitting
21 in the lower reactor pedestal because once the drain
22 line fails it goes in there. But because of the flow
23 through the drain plug. And how much is in there will
24 be connected. You will see some of these.

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1 The volumes are very, very small. You
2 know, we are talking about maybe a couple of hundred
3 cubic meters compared to maybe 4,000 in the wetwell and
4 about --

5 MEMBER POWERS: It's just that you've got
6 these spikes in there --

7 DR. ESMAILI: So they would be down, yes.

8 MEMBER POWERS: -- on one curve and no
9 corresponding spikes or even minor deviations anyplace
10 else.

11 DR. ESMAILI: Right.

12 MEMBER POWERS: I mean, that's kind of
13 remarkable. Because there's a lot of enthalpy in those
14 spikes. I mean, to go from 500 to 1,200 degrees
15 Fahrenheit is a fair amount of enthalpy in anything.

16 DR. ESMAILI: Right. I can, you know --

17 MEMBER POWERS: No.

18 DR. ESMAILI: -- flow paths. There are
19 multiple flows connecting the upper and the lower
20 reactor.

21 MEMBER CORRADINI: Can I ask the same? Is
22 this the upper drywell head or the whole pedestal
23 region?

24 DR. ESMAILI: The red line is just right

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1 below the reactor. It's the drywell pedestal.

2 MEMBER CORRADINI: Oh, so it's not the
3 whole drywell.

4 DR. ESMAILI: No, no, no. It's just about
5 a few hundred --

6 MEMBER CORRADINI: All right, now I get
7 it.

8 DR. ESMAILI: So that volume that you see
9 right before --

10 MEMBER CORRADINI: Where the blue box is.

11 DR. ESMAILI: Yes, right. Where the blue
12 box is, correct. Right here. This one.

13 MEMBER CORRADINI: Okay.

14 DR. ESMAILI: And this is only, you know.

15 MEMBER CORRADINI: Okay, fine.

16 MEMBER POWERS: It looks like to me what
17 they assume is that the whole core melt comes down.
18 That all that structure below is either consumed or
19 ignored or something. There's no hangup on there.

20 And what I'd note, it'd be interesting to
21 see what happens if you throw a bunch of core debris
22 on that upper structure. And it would be frozen, but
23 it would be hotter than a pistol, and any of the water
24 you would put in you would turn into steam and be just

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1 heated up up there fairly hot. That would be an
2 interesting calculation.

3 But you didn't do that calculation.

4 DR. ESMAILI: We didn't do that because we
5 don't have the models. We are trying to put similar
6 models into MELCOR. We don't have that.

7 But even in this case, this is no water.
8 This is without water addition.

9 MEMBER POWERS: Yes.

10 DR. ESMAILI: So you still have a very,
11 very hot debris that can radiate.

12 MEMBER POWERS: Yes, but no surface area.
13 So you're living and dying on a very small heat transfer
14 area to the gas.

15 DR. ESMAILI: Right. But it does heat up
16 the atmosphere.

17 MEMBER POWERS: Oh, I bet it does. It's
18 melting steel up there. You're getting steel coming
19 down here, aren't you?

20 MEMBER BALLINGER: 2,800 degrees, you're
21 done for.

22 MEMBER POWERS: Yes. They're probably
23 just creeping it out and building it in. It's probably
24 coming down on them and everything else. That's toasty

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1 up there.

2 MR. KARIPINENI: So, if there were to be
3 a drywell vent with no ventilation that would be the
4 temperatures it may be looking at that. And at this
5 point it's core number 1.

6 At this point there is no guidance in NEI
7 13-02 regarding an event like that. Let's go to the
8 next slide.

9 Slide 6. That's the benefit of water
10 addition at Mark 1 containments. You see that the
11 temperatures vary from 400 down. A big reduction in
12 the temperatures in the drywell.

13 And the next slide shows --

14 MEMBER POWERS: This is your 500 gallons?

15 MR. KARIPINENI: 500 gallons.

16 MEMBER POWERS: 500 gallon. So it's a
17 pretty good flow.

18 MR. KARIPINENI: Yes. The next slide is
19 for Mark 2's. A big water addition again. And you can
20 see the temperatures again are below 400 which
21 basically meets the earlier guidance we had in Phase
22 I for that element which is 545 degrees.

23 And it also helps the leakage from CSX L1
24 (phonetic) reduce the leakage.

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1 DR. ESMAILI: Can I say something? You
2 brought this up about this temperature. You can see
3 these temperatures, for example, the upper reactor
4 category goes from 300 to almost 150. So there's large
5 temperature variations.

6 And as I said, you know, because of this
7 connectivity between the upper and the drywell -- upper
8 and lower pedestal and the amount of water that can
9 possibly accumulate.

10 You see that, for example, it heats up.
11 And as the water accumulates it starts to cool the
12 atmosphere. So there's lots of effects that are going
13 on here. But in the end the temperatures are
14 relatively low.

15 MEMBER CORRADINI: But just -- 18 hours or
16 16 hours, that's essentially material coming out of the
17 vessel, I assume.

18 DR. ESMAILI: That is when the lower head
19 fails.

20 MEMBER CORRADINI: Okay.

21 DR. ESMAILI: So you see the upper
22 reactor, it shoots up.

23 MEMBER CORRADINI: Okay, fine.

24 MEMBER POWERS: How much metal is there in

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1 that? I mean, how much of the clad in that debris that
2 comes down?

3 MEMBER CORRADINI: Roughly. A lot or a
4 little bit.

5 DR. ESMAILI: A lot. Because --

6 MEMBER POWERS: It doesn't have enough
7 time to steam oxidize.

8 DR. ESMAILI: That's right. And you have
9 a lot of time inside the vessel. So typically it takes
10 about, you know, at least four to six hours. You are
11 hanging this thing inside the vessel for about four to
12 six hours before you can fail the lower head.

13 And even before that you have an additional
14 two to three hours for you to -- so there's a lot of
15 material that's coming down.

16 MEMBER POWERS: Do you get the upper
17 internal?

18 DR. ESMAILI: No, we don't model the upper
19 internals.

20 You know, the BWR SAR calculation that was
21 from, like, two decades ago, that one predicted -- of
22 course that was just pure metallic flow for the first
23 two hours, one and a half to two hours.

24 MEMBER POWERS: Yes.

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1 DR. ESMAILI: And even then that was only
2 about maybe 15,000 kilograms, you know, approximately
3 50/50 zirconium and steel. So there was not much
4 material coming down in terms of metals based on the
5 old calculations.

6 MEMBER POWERS: Yes, but that particular
7 metal does grievous things to your concrete.

8 DR. ESMAILI: Right, right. And just
9 because of that we have done sensitivity calculations
10 because we wanted to find out what the effect of the
11 debris on the half-inch drain plugs, everything, is.

12 Because there are large uncertainties.

13 MR. KARIPINENI: Slide 8. This is Method
14 2 where you will have a drywell vent and also severe
15 accident water addition.

16 The issues that we have in the draft ISG
17 regarding the functional requirements for SAWA, they
18 have been addressed now. And they are addressed as
19 time-sensitive actions.

20 The equipment capabilities in various
21 sections of the guidance sections 4, 5 and 6, and also
22 Appendix I.

23 And we believe all the issues have been
24 resolved and therefore conclude that there are no more

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1 issues in this regard. Next slide.

2 This is Method 3 where you will have a
3 wetwell vent. And the idea being preservation of the
4 wetwell vent would preclude the need for a drywell vent.

5 The issues in the draft ISG again are
6 regarding the functional requirements for SAWM and the
7 ultimate containment heat removal system. Coping
8 times, et cetera have been resolved.

9 They were also addressed as time-sensitive
10 actions. And the functional requirements for both the
11 heat removal and the severe accident water management.

12 The level of these requirements,
13 functional requirements, have been divided in sort of
14 three categories.

15 The first category is sustained operations
16 for completed in seven days with the wetwell vent
17 preserved for all the seven days. Therefore there is
18 no requirement for any of the functional requirements
19 for other systems like containment heat removal for
20 that one case.

21 For the next case, sustained operations,
22 there are seven days but the wetwell vent is only
23 preserved for greater than three days in which case the
24 guidance now contains the functional level description

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1 for what that alternate heat removal system might be,
2 for the staff to look at and agree with that.

3 The case 3 is again wetwell vent preserved
4 for less than three days in which case the guidance
5 states that there will be a detailed description
6 provided for the alternate heat removal system with
7 potential modifications that may be required to
8 facilitate the containment heat removal system
9 placement within that time.

10 Therefore, all the questions regarding
11 Method 3 in the draft ISG are considered.

12 The comments, there were four comments,
13 conclusions and recommendations in the ACRS full
14 committee letter.

15 The first one of them is about the comments
16 and open items identified in the draft ISG.

17 What we have done since then is we have
18 taken care of all the open issues with the industry and
19 the guidance has been modified as well as the ISG has
20 been modified.

21 We also addressed all the public comments
22 that came in as well as we considered all the comments
23 that we have received from the ACRS and as we are
24 describing what we have done on these things.

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1 The second conclusion in the
2 recommendation states that the guidance is a generic
3 basis, and substantial work remains to be done.

4 And staff kind of agrees with that comment
5 for the reason that details are not fully available to
6 us in the OIPs on the vent systems yet. It is still
7 open at this point.

8 But as the details come in as time goes we
9 are looking and resolving all those, any questions we
10 have with them.

11 It's the kind of thing because you've got
12 20 to 24 plants and everybody is designing the vent
13 system a little bit differently. They're running
14 through whether they have a final control valve or not
15 to operate the system close and open.

16 There's many, many things in there.
17 That's why it kind of looks generic, but using the OIP
18 issues we will know exactly what they are doing given
19 they were given four or five options in some cases, and
20 which option they're following, and we can ask them the
21 questions at that time.

22 CHAIRMAN SCHULTZ: I think you've
23 captured our concern.

24 MR. KARIPINENI: Thank you. The ACRS

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1 also noted that we haven't addressed at all your
2 comments on Phase I, yet also concluded that some more
3 attention needs to be given.

4 And basically what I have said before
5 applies in this case also. As the OIPs come in we'll
6 be looking at all of these things in more detail.

7 Last conclusion and recommendation was
8 that water addition, all methods of water addition
9 during severe accidents should be considered,
10 particularly the diverse drywell sprays to take
11 advantage of radioactive source terms during wetwell
12 venting.

13 Our response to that is that we have
14 assessed the pressure and end-pressure responses with
15 these two primary water addition points and concluded
16 that both of them would meet the requirements within
17 the confinement of the outer.

18 And as we go in the last leg we'll get into
19 a little bit more discussion. Hossein will talk about
20 what we have done on the CPRR and whether or not that
21 would meet some of your concerns, that it satisfies one
22 of your concerns. We'll see.

23 The last slide. In addition, the
24 conclusions and recommendations you made mentioned a

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1 couple of concerns about the combustible gas controls
2 and the radiological dose calculations.

3 We have the white paper on the combustible
4 gas control system. That's given about five options
5 for the licensees to follow.

6 We believe the active method such as the
7 installation of a shut valve at the end of the vent line,
8 or a continuous -- interrupting the vent line.
9 They're rather easy for NRC also to approve.

10 But the one about the design so that you
11 can -- the degradation possibilities of -- concerning
12 reduced by the design, that's an area that will probably
13 require a careful review if any licensees will come and
14 want to take that approach.

15 We agree with that, but at this point
16 that's all we can do.

17 Regarding the radiological doses we thank
18 you for commending the work we have done since the last
19 meeting. But still you express the opinion that a
20 careful evaluation needs to be taken and we will
21 definitely do that.

22 The three appendices give a very generic
23 approach for the licensees to follow. Until we know
24 exactly -- until they also know where exactly the pipe

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1 vent is being run in the reactor building, where are
2 the places where the operator has to go and take actions
3 for flow panels, et cetera, until all those details are
4 available they will not be able to tell also much more
5 than what we have in the appendices right now. But
6 we'll be waiting for that information.

7 CHAIRMAN SCHULTZ: So with regard to
8 combustible gas controls you indicate that, yes, you
9 agree there were many options that could be taken from
10 the guidance document, and that you need to review those
11 carefully.

12 And you also indicate that some would be
13 easily acceptable and others would require additional
14 consideration, perhaps more calculation and
15 determination.

16 How is that being communicated and
17 discussed with industry?

18 MR. KARIPINENI: In the meetings we have
19 expressed the same thoughts many times.

20 CHAIRMAN SCHULTZ: In the public
21 meetings?

22 MR. KARIPINENI: In the public meetings,
23 that something of a design, a design of the pipes to
24 preclude the possibilities of deflagration.

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1 That would require a very careful review
2 from a design exceptions in NRR, et cetera. We would
3 need probably good experts to look into that area, the
4 lengths of pipes are proper, and where are the vents,
5 and what are the velocities, et cetera.

6 At this point we don't know how many of them
7 would come and take that approach. We have a few OIPs
8 that have said already that they will install a shut
9 valve and at the end of the vent pipe. And we are very
10 happy about that.

11 But there are a significant number of
12 licensees haven't said anything about this yet.

13 CHAIRMAN SCHULTZ: Okay. Thank you.

14 MR. KARIPINENI: In conclusion we have met
15 these 545 degrees. From the vent point of view I think
16 we have come to a point the guidance is supportable and
17 therefore the ISG, we think as it stands now it's good.

18 Regarding the concerns about the releases,
19 et cetera, I would turn it over to Hossein to say a few
20 words.

21 DR. ESMAILI: This is easy. So we
22 acknowledge there are uncertainties and we also agree
23 that the containment sprays can reduce source term.

24 I think regarding the containment spray,

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1 you know, is that if the intention is to -- if you go
2 to the recirculation that you were discussing, yes.

3 But initially you don't want to over-cool
4 and over-fill the containment. So, the ability of the
5 containment space initially would be somehow reduced
6 if there is not enough flow going to the spray.

7 But we agree with these uncertainties.

8 And this uncertainty in progression, I
9 think you brought this thing up last time. And we've
10 been looking back at some of the analysis that was done
11 by Oak Ridge. You know, this is around NUREG-1150.

12 And the question is that one of the
13 important things was how long does it take for the
14 bypass to occur. This bypass, it depends on what the
15 design is. For example, from Limerick it's like about
16 a half an inch plate that's slotted.

17 And Columbia, it's a little bit different.
18 It's like perforated pipes.

19 But they did a careful study. You know,
20 expert solicitation said that it takes about 20 minutes
21 for this once the debris comes out.

22 Then Oak Ridge did some analysis to show
23 that if indeed initially the flow is molten metal,
24 zirconium and steel, there is a possibility that this

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1 thing can actually crust up.

2 So they did a calculation of the cooling
3 effect of the metal as it comes down and the ablation
4 of the plate itself. But they acknowledged
5 uncertainties.

6 So what we tried to do here is that we tried
7 to address those two sensitivity calculations, knowing
8 that there could be a different timing in terms of when
9 this bypass occurs.

10 Severe accident behavior modeling is an
11 area of active research, both in Japanese and South
12 Koreans, actually. They are trying to look at this,
13 what happened, especially in the lower plenum. I think
14 they have some general idea of what's going on inside
15 the core. You know, some aspect of the previous even
16 PWR melt progression may be applicable.

17 Then there was BWR-specific experiments
18 like XR2, you know, that was done at Sandia. And so
19 anyway, so this is --

20 MEMBER POWERS: Well, XR2, just looking at
21 whether you can go through a support plate.

22 The really crucial thing is how to bridge
23 between the core test and where XR2 starts. We've got
24 nothing. I mean, there's just no experiment at all.

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1 DR. ESMAILI: I don't know if all the
2 details of what the plans are. I think this is still
3 an ongoing area that they want to look at.

4 What I can tell you is that as far as
5 whatever is happening inside the vessel the containment
6 pressures and temperatures for this order, not for the
7 CPRR, the most relevant parameters.

8 So what we tried to do --

9 MEMBER CORRADINI: What are the most
10 relevant parameters?

11 DR. ESMAILI: For the OW1 to make sure that
12 you are below this 545.

13 So what we did was that, again, we did look
14 at a range of uncertainties. Like at what point do you
15 vent -- what time is the venting, the timing of the
16 venting. What time is the, you know, you have the
17 bypass, et cetera.

18 In our calculations you saw some examples
19 of the drywell temperatures. This remains well below
20 545 degrees.

21 And comparing our reference Mark 2 and Mark
22 1 the drywell by itself has about 50 percent more
23 volume. So it's a significant volume inside the
24 drywell here in the Mark 2.

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1 And again, last point, we are -- we have
2 done some sensitivities in support of the CPRR
3 rulemaking acknowledging all those uncertainties that
4 were brought up before.

5 And timing of suppression pool is one
6 aspect.

7 MEMBER POWERS: I mean, your concern is
8 just what is the temperature going into that vent. I
9 mean, that's the only thing you care about. So it's
10 really just the amount of enthalpy you can put into the
11 gas and hope the gas flow pathway is.

12 DR. ESMAILI: Correct.

13 MEMBER POWERS: So I mean, you can even do
14 that almost artificially and whatnot. The stuff that
15 we don't understand affects other things.

16 DR. ESMAILI: Correct.

17 MEMBER POWERS: Usually it's just how much
18 heat, how much heat are you carrying to that pipe.

19 DR. ESMAILI: And you know, in water --

20 MEMBER POWERS: And you can't carry too
21 much because it's gas. It can only be so hot.

22 DR. ESMAILI: So anyway, so we have done
23 enough sensitivities trying to --

24 MEMBER POWERS: In the Mark 2, where does

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1 the heat from the gas go? I mean, you're coming out
2 hotter than a pistol. You're melting steel with your
3 gas. And then it drops like crazy.

4 DR. ESMAILI: Express element you mean?

5 MEMBER POWERS: Yes. I mean, in your
6 calculation there for the dry case your gas temperature
7 between the pedestal region and your wetwell, the gas
8 temperature drops a lot. Where's the heat going?

9 DR. ESMAILI: All the temperatures that
10 you saw around 2,000, the reason it's that high of a
11 temperature is because it's very small volume. So it
12 really heats it up.

13 Some of the --

14 MEMBER POWERS: You're just mixing it out?
15 I mean you just vent it into -- when you go into the
16 wetwell airspace you're mixing with --

17 DR. ESMAILI: And then heat transfer to
18 the -- so by the time it makes it to the wetwell, even
19 without water addition actually --

20 MEMBER POWERS: Yes, I mean --

21 DR. ESMAILI: -- you have other addition.
22 It's relatively cool. It's well below. You know,
23 there's not that much difference I see between the
24 drywell and the wetwell temperatures.

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1 Because by that time if you vent there's
2 not that much force for the flow to occur. So things
3 are relatively, you know, quiet.

4 MEMBER POWERS: So there's just a mixing.
5 I mean, you're really not putting it into any particular
6 structure. You're just mixing it.

7 DR. ESMAILI: Well, we do model heat
8 transfer to the pedestal wall. But I think mixing --
9 I mean, heat transfer to the surface of the water. But
10 there's a lot of surface of water.

11 MEMBER POWERS: Yes, I guess there's a lot
12 of surface.

13 DR. ESMAILI: Those are all taken into
14 account.

15 DR. AULUCK: Dr. Schultz?

16 CHAIRMAN SCHULTZ: Other discussion or
17 questions from members of the committee or the NRC staff
18 on this topic?

19 Hearing none that concludes our
20 presentations for today. What I would like to do at
21 this point in time is open up the telephone line for
22 public comments.

23 And while that's being opened I'd like to
24 ask if there are any members of the public in the room

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1 today who would like to make a comment for the benefit
2 of the committee.

3 Seeing none here in the room I'll wait for
4 a moment for the line to open. We understand that the
5 line is open. If there are members of the public on
6 the line if you could please indicate hello to us so
7 that we know the line is open and that someone is out
8 there to speak.

9 PARTICIPANT: Hello.

10 CHAIRMAN SCHULTZ: Hello. Okay, great.
11 Are there members of the public who would like to make
12 a comment for the benefit of the committee? If so,
13 please introduce yourself and make your comment.

14 Hearing none from members of the public
15 I'll turn to member comments and discussions. And Dick
16 Skillman, are you on the line? Not hearing that Dick
17 is on the line we'll move to the room.

18 Pete, comments related to today's
19 discussions that you'd like to make?

20 MEMBER RICCARDELLA: About just this last
21 topic or about the whole day?

22 CHAIRMAN SCHULTZ: About the whole day.

23 MEMBER RICCARDELLA: Well, you know, as
24 I've indicated in my earlier comments that I have

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1 concerns about the size of the passage of the FLEX.

2 I know the current document NEI 12-06 says
3 that FLEX equipment should be stored in a structure that
4 meets the plant's design basis for safe shutdown
5 earthquakes. That's what it currently says.

6 Now, I understand that Appendix H is
7 supposed to address that, but we haven't seen that yet
8 and we're getting down to the wire. And that's the one
9 area that I have a concern with.

10 CHAIRMAN SCHULTZ: Thank you. Harold,
11 comments for today?

12 MEMBER RAY: Well, let me just try and
13 encapsulate what I said earlier which I perceive as
14 generally agreed upon, or by many anyway.

15 And that is that this is a necessary but
16 a major impact. We're dealing now with what the
17 requirements should be in some specific detail.

18 But there's remaining, I think, the
19 question of how what we're talking about having to do
20 fits in with everything else that exists in the
21 industry.

22 And I don't mean to suggest that it isn't
23 necessary that this occur, but how it occurs is I guess
24 my main interest.

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1 Others are I think properly focused on
2 specific aspects of what exactly would be done in one
3 area or another. But I just use the examples that I
4 used earlier of, okay, we -- all of us who have been
5 involved in commercial operations have dealt with
6 emergency planning which is at one end of the spectrum,
7 and with maintaining operator licenses which is at the
8 other end of the spectrum when it comes to the rigor
9 of training, the frequency of testing, and so on.

10 This fits somewhere in the middle, I think.
11 I don't believe most of these requirements, if any of
12 them, go to at this stage of the game anyway to what
13 licensed personnel are examined for.

14 But there is at least some feeling that
15 there will need to be a way of measuring the readiness
16 of the larger group either to assume some status similar
17 to a licensed operator, or otherwise maintain a level
18 of training which significantly exceeds what's been
19 required up until now.

20 And I do include of course the fact that
21 people like STAs, for example, have been required to
22 be trained in what they do until now.

23 But still and all what we're looking at
24 here goes beyond that and includes a lot of folks to

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1 implement it.

2 I know we plan to have drills. These are
3 being conducted. There's lots of tabletops. Things
4 have been mentioned here.

5 But I guess I take the longer view of, okay,
6 10-20 years from now what is the level of expertise to
7 implement this. Because this is a very, very rare
8 event that we're talking about.

9 And maintaining that capability over the
10 long run is -- and how you achieve that is what I'm
11 interested in. That's not what we're talking about
12 today, but if there's some way that that gets captured
13 in terms of something that needs to be addressed in the
14 future more rigorously than I think is appropriate now
15 I think that would be my input.

16 CHAIRMAN SCHULTZ: Thank you. Dana,
17 comments for today?

18 MEMBER POWERS: I don't think I want to add
19 anything in particular. What Harold raised as far as
20 the level of expertise and the surprise people will have
21 when some of these events, should they take place and
22 how they react to it is an interesting question.

23 But again, as Harold says, we're talking
24 about a 10^{-5} event. And how much you should threaten

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1 your training capabilities to accommodate a 10^{-5} event
2 is something that needs careful consideration.

3 CHAIRMAN SCHULTZ: John?

4 MEMBER STETKAR: Yes. First, I'd like to
5 thank everybody, NEI, industry, staff has put together
6 a lot of information. And I think it was really useful
7 to try to digest all of this in this one-day session.
8 It's a lot more effective I think than seeing it
9 piecemeal. I really appreciate all the effort
10 everybody put into the presentations.

11 I think in summary I'll come back to this
12 notion of integration of the guidance, both in the sense
13 of integrating the paper guidance that I'll
14 characterize as the FLEX support guidance, and the
15 SAMGs and the EDMGs. If you want to talk about fire,
16 flooding procedures, all of those sort of things, to
17 make sure that we're not somehow making life more
18 complicated for the operators or decision-makers -- I
19 include the offsite response organization as part of
20 that decision team -- by fragmenting that guidance too
21 much.

22 I mean that's why I think it would be very
23 useful for us to see some examples of how that's really
24 being developed.

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1 And also the other part of the integration,
2 a couple of the issues that I've raised, for example,
3 assumptions that are being made regarding things like
4 in the context of the BWR examples here of, well, we
5 don't need to re-power a certain set of valves until
6 eight hours because for the specific purpose of saving
7 the containment we can demonstrate that that's
8 adequate.

9 And yet, for the purposes of preventing
10 damage to the core we have other assumptions that say,
11 well, we don't even need to consider that water
12 addition.

13 So, I think I'll leave it there. I'm a bit
14 concerned that I'm not sure who from either the industry
15 or the staff is looking at the integration from kind
16 of that perspective.

17 CHAIRMAN SCHULTZ: Thank you, John.
18 Dennis?

19 MEMBER BLEY: I too would like to thank
20 everyone for good presentations and really good
21 discussions.

22 My hope is as we see things in more detail
23 all the things we've worried about today will not worry
24 us anymore. I look forward to seeing things as they

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1 come forward.

2 I echo many of John's thoughts, but we hear
3 a lot of good things as well. So, thank you for the
4 day.

5 CHAIRMAN SCHULTZ: Very good. Mike?

6 MEMBER RYAN: I'd like to just second the
7 comments that John Stetkar and Dennis Bley made. I
8 think you captured many of my own thoughts.

9 I want to thank all the presenters and
10 folks that helped presenters to get all this material
11 together for us. You covered a wide range of issues
12 and gave us a lot of insights. That's hard work,
13 pulling all that together, so we appreciate it. Thank
14 you very much.

15 CHAIRMAN SCHULTZ: Ron?

16 MEMBER BALLINGER: This is probably the
17 first case where I've been involved from the beginning
18 until now. I've seen a very large progression in terms
19 of with time. I think that's a tribute to a lot of the
20 work that you guys in the industry and NRC staff has
21 done.

22 And I think you'll make Game 4.

23 CHAIRMAN SCHULTZ: We have to wait for
24 Charlie before we claim that we're going to make Game

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1 4.

2 MEMBER BALLINGER: I would repeat what I
3 said earlier, that I do think to help us understand how
4 all this integrates as this seems to be the key.

5 Some sort of presentation or exercise that
6 we can actually ask questions as you go through the
7 exercise. I guess "tabletop" is the current word.
8 But just some sort of exercise and see how this
9 integrates would be very beneficial for me. Since I
10 really am not totally clear on all these various
11 procedures and how they fit together.

12 CHAIRMAN SCHULTZ: Thank you very much.
13 I would like to also -- oh, excuse me. Bill Shack, our
14 consultant. You're now recognized. Thank you.

15 CONSULTANT SHACK: Well, I just want to,
16 again, appreciate all the discussions today. I think
17 a lot of them I would echo the comments.

18 I would like to point out, I think there's
19 a lot of improvements in NEI 12-06 which is the sort
20 of basic document here.

21 A lot of clarity, a lot of additional
22 stuff.

23 Appendix C I think is something that
24 responds partly to what the ACRS asked for. John is

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1 still unhappy. Compared to what there was before -
2 nothing - it's a great improvement.

3 I'm looking forward to see Appendix G and
4 H. I sort of echo, you know, that's been a problem all
5 along with the whole mitigation scheme is how it really
6 addressed beyond-design basis events and sort of Pete's
7 discussion.

8 So I'm looking forward to Appendix H which
9 again if it's still an unresolved issue. And Appendix
10 G begins to address that for the flooding situation.

11 So I think we've made a great deal of
12 progress. I think Appendix G and Appendix H are
13 important things to address yet in the guidance. And
14 I'd be interested in seeing how that works out.

15 CHAIRMAN SCHULTZ: Thank you, Bill. In
16 closing I'd first like -- I had mentioned this morning
17 Ms. Kathy Weaver who's been integral in putting
18 together this meeting.

19 I did also want to recognize Mike Snodderly
20 of the ACRS staff and Weidong Wang who also participated
21 in these issues as well as bringing together the staff
22 presentations and the NEI presentations before us
23 today.

24 I too want to thank the presenters for the

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WASHINGTON, D.C. 20005-3701

1 work that's been done to bring forward each of these
2 topics. I think we have heard excellent summaries and
3 displays of what has been done not only over the last
4 month since we last met but also a representation of
5 what has been done over the past, as Ron said, it goes
6 way back before he joined the committee in terms of
7 getting us to where we are today.

8 My closing comments would certainly echo
9 everything that the other members have said.

10 I would add that there are many aspects,
11 especially in the mitigating strategies area, but there
12 are many aspects of the overall rulemaking that we have
13 not considered in our discussions today. We focused
14 on some regulatory guidelines.

15 And we will have opportunities as the
16 program moves forward to the draft final rulemaking
17 activity to weigh in again in not only these issues but
18 others as well.

19 With regard to the issues related to Mark
20 1 and Mark 2 containments we have the CPRR discussions
21 coming up in our subcommittee meetings coming forward,
22 and also full committee most likely happening at the
23 end of summer.

24 So we'll be talking about these topics in

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1 additional discussions. We look forward to that.

2 With that I'll move forward to close the
3 meeting.

4 (Whereupon, the above-entitled matter
5 went off the record at 4:49 p.m.)

6

7

Draft Regulatory Guide DG-1301 and NEI 12-06, Revision 1

ACRS Fukushima Subcommittee Meeting
May 6, 2015

Scott Bauer, Sr. Project Manager, NEI

Bryan Ford, Sr Manager - Regulatory Assurance, Entergy Nuclear

Michael Powell, Director Fukushima Initiatives, Palo Verde

NEI 12-06, Revision 1 Status

- Proposed Revision 1 to NEI 12-06 addresses:
 - Conformance to proposed rule
 - Elimination of references to Orders
 - Changes to incorporate NRC-approved alternatives
 - Generic topic position papers (>12 topics)
 - Frequently asked questions (>30 FAQs)
- Changes have been presented in public meetings

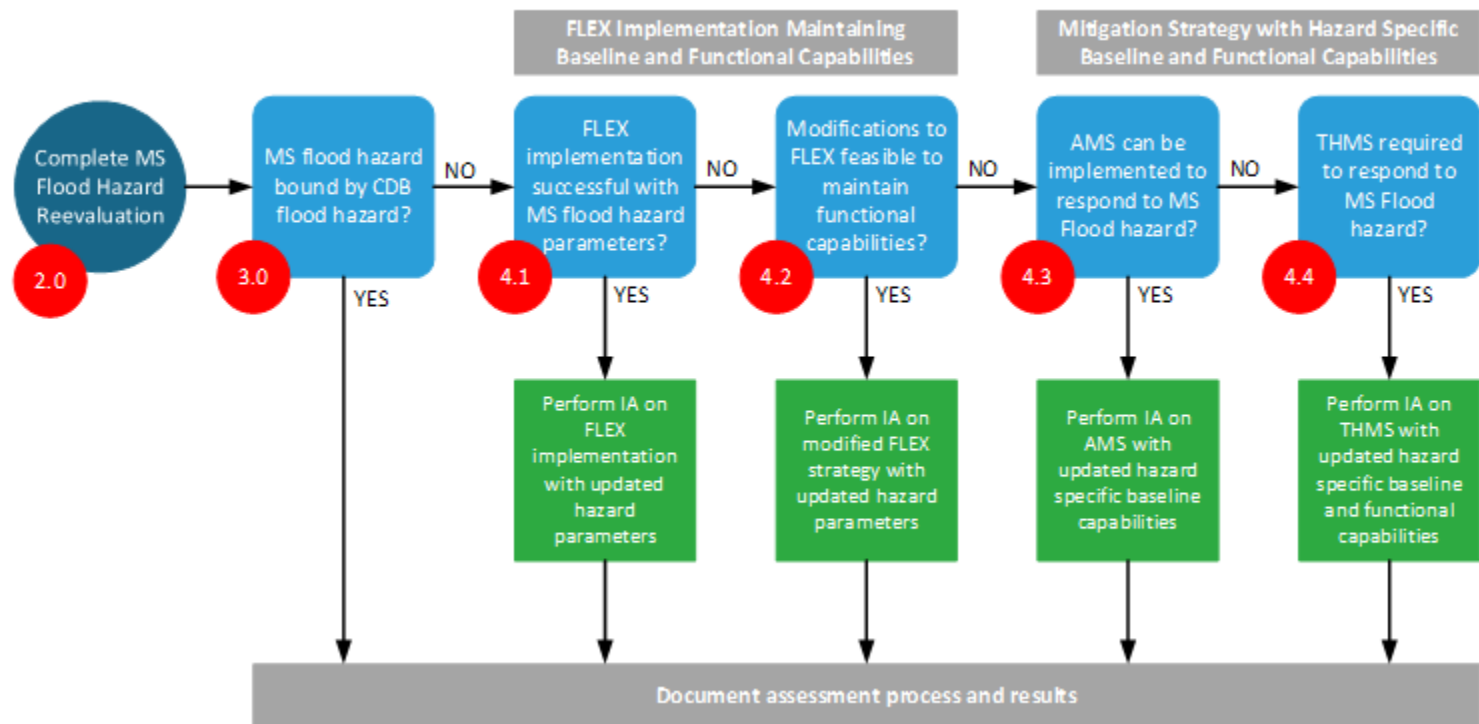
NEI 12-06, Revision 1 Status

- Remaining issues:
 - Generic questions on RCP seals
 - Generic question on NOTRUMP code
 - Maintenance rule resolution
 - Appendix G for addressing flood hazard reevaluation (has been developed and is undergoing review)
 - Appendix H for addressing seismic hazard reevaluation (in early stages of development)

Appendix G- Reevaluated Flood Hazard

- Provides four paths for mitigation:
 - Use FLEX as is
 - Modify FLEX
 - Develop an alternate mitigating strategy
 - Develop a targeted hazard mitigating strategy
- Submitted to the NRC on April 27, 2015

NEI 12-06 Mitigating Strategies Assessment



1

Draft Regulatory Guide DG-1301

- Being evaluated by the industry
- One preliminary concern
 - Changes the description of an extended loss of ac power event to include loss of ac power to buses fed by station batteries through inverters (vital ac power)
 - This would introduce a substantive change from the guidance under which FLEX has been implemented
 - Loss of dc and vital ac instrument power was not considered in the sequence of event time lines
 - Guidance does have provisions for remote start capability for TDAFW or RCIC pumps and reading instruments locally but these are backup capabilities

Draft Regulatory Guide DG-1301, Appendix A

- Appendix A contains guidance for applicants for new nuclear power plants
- NEI 12-06 originally developed with a generic version of Appendix F to address application to new plants
- As a result of public meetings Appendix F reverted to AP1000 only
- NRO developed Appendix A for other new reactor designs

Draft Regulatory Guide DG-1301, Appendix A

- Appendix A is being reviewed by the industry
- Intend to incorporate it into NEI 12-06 when comments are resolved

Maintenance Rule Applicability to FLEX Eq

- Maintenance rule contains an exception for SAMG and EDMG equipment
- Same exception should apply to FLEX equipment
- NEI 12-06 addresses equipment maintenance in Section 11.5
 - Standard industry templates have been developed addressing specific maintenance and testing of FLEX equipment
 - EPRI maintenance guide for FLEX equipment endorsed by NRC as a generic topic

Draft Regulatory Guide DG-1319 (*Proposed New Regulatory Guide 1.228*) “Integrated Response Capabilities for Beyond-Design-Basis Events”

Milt Murray, NSIR/DPR

Tim Kolb, NRR/DIRS

May 6, 2015

Status

- Currently in draft form
- Final draft guide to be completed and published in conjunction with MBDDBE Proposed Rule

DG-1319 “Integrated Response Capabilities for Beyond-Design-Basis Events”



Endorses NEI 12-01, “Guidelines for Assessing Beyond Design Basis Accident Response Staffing and Communications Capabilities”

Endorses NEI 13-06, “Enhancements to Emergency Response Capabilities for Beyond Design Basis Events and Severe Accidents”

Endorses NEI 14-01, “Emergency Response Procedures and Guidelines for Beyond Design Basis Events and Severe Accidents” with clarifications

“Integrated Response Capabilities for Beyond-Design-Basis Events”

NEI 12-01, “Guidelines for Assessing Beyond Design Basis Accident Response Staffing and Communications Capabilities”

- Previously endorsed by NRC for the March 12, 2012 RFI
 - Re-assessment of staffing/communications for the rulemaking is not required
- NEI 12-01 provides an acceptable method to assess accident response staffing in order to meet the requirements of 10 CFR Part 50, Appendix E, Section VII.1
- NEI 12-01 provides an acceptable method to assess communications capabilities in order to meet the requirements of 10 CFR Part 50, Appendix E, Section VII.2

“Integrated Response Capabilities for Beyond-Design-Basis Events”

NEI 13-06, “Enhancement to Emergency Response Capabilities for Beyond Design Basis Events and Severe Accidents”

- EP facilities and equipment
 - NEI 13-06 provides an acceptable method to meet the emergency facilities and equipment requirements of 10 CFR Part 50, Appendix E, Section IV.E.2
- Multi-unit dose assessment
 - NEI 13-06 provides an acceptable method to meet the assessment actions requirements of 10 CFR Part 50, Appendix E, Section IV.B.1

“Integrated Response Capabilities for Beyond-Design-Basis Events”

- Training
 - NEI 13-06 provides an acceptable method to meet the training requirements of 10 CFR 50.155(e)

- Drills and exercises
 - NEI 13-06 provides an acceptable method to meet the drill and exercise requirements of 10 CFR 50.155(f)

“Integrated Response Capabilities for Beyond-Design-Basis Events”

NEI 14-01, “Emergency Response Procedures and Guidelines for Beyond Design Basis Events and Severe Accidents”

- Procedure Integration

- NEI 14-01, Section 2.4 provides an acceptable method and appropriate elements for meeting 10 CFR 50.155(b)(4) requirements for procedure integration
- Fire response procedures not included in integration
 - Included in scope of NTTF Recommendation 3 (Tier 3)

DG-1319

“Integrated Response Capabilities for Beyond-Design-Basis Events”

- SAMGs
 - NEI 14-01, Section 3.2.2 (Principles of SAMGs) and Section 3.2.3 (Considerations for site-specific SAMGs) provide an acceptable method to develop, implement and maintain SAMGs as required by 10 CFR 50.155(b)(3)

“Integrated Response Capabilities for Beyond-Design-Basis Events”

- Command and Control
 - NEI 14-01, Section 4 provides an acceptable method in combination with existing ERO command and control structure guidance to meet the requirements of 10 CFR 50.155(b)(6). The guidance in NEI 14-01 is principally limited to the roles, responsibilities and authorities of an Ultimate Decision Maker (UDM).

Draft Regulatory Guide DG-1301 and NEI 12-06, Revision 1

ACRS Fukushima Subcommittee Meeting
May 6, 2015

Scott Bauer, Sr. Project Manager, NEI

Bryan Ford, Sr Manager - Regulatory Assurance, Entergy Nuclear

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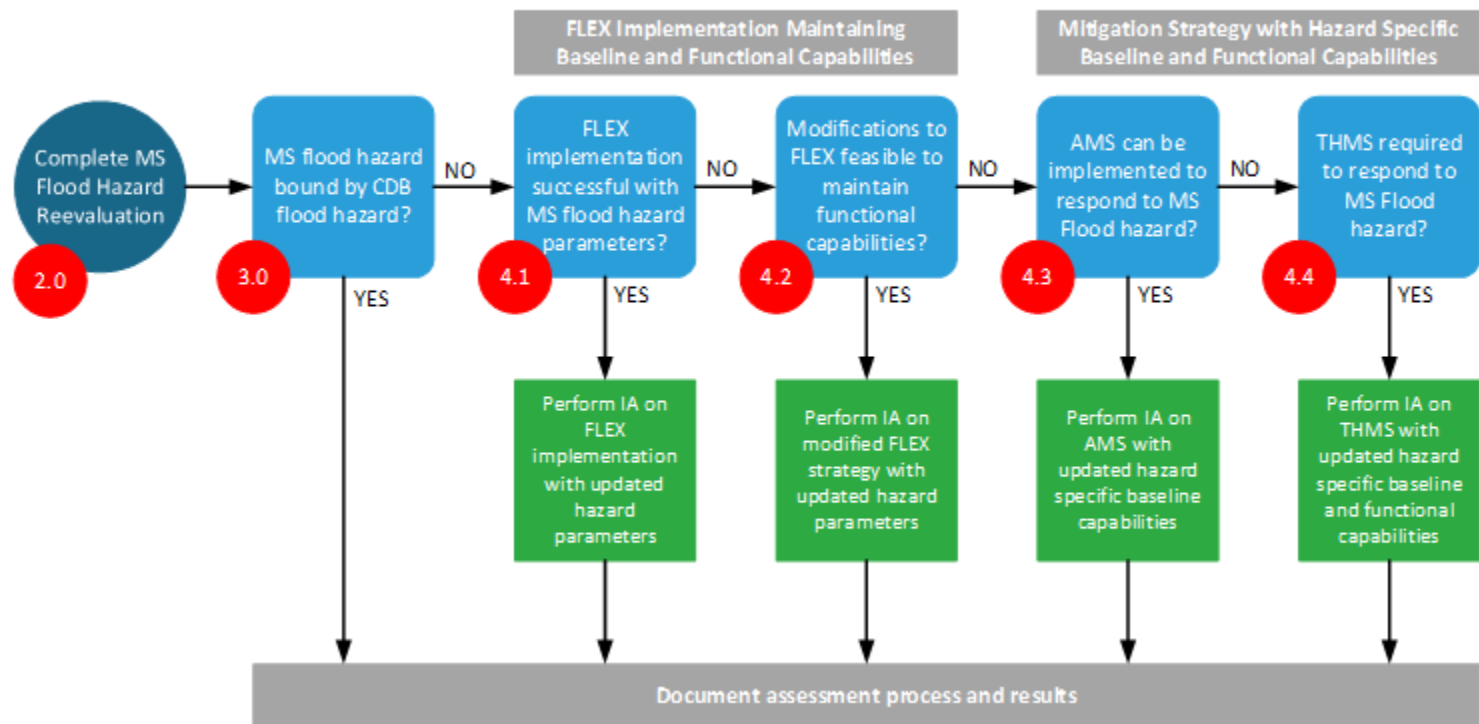
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Draft Regulatory Guide DG-1301

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Draft Regulatory Guide DG-1301, Appendix A

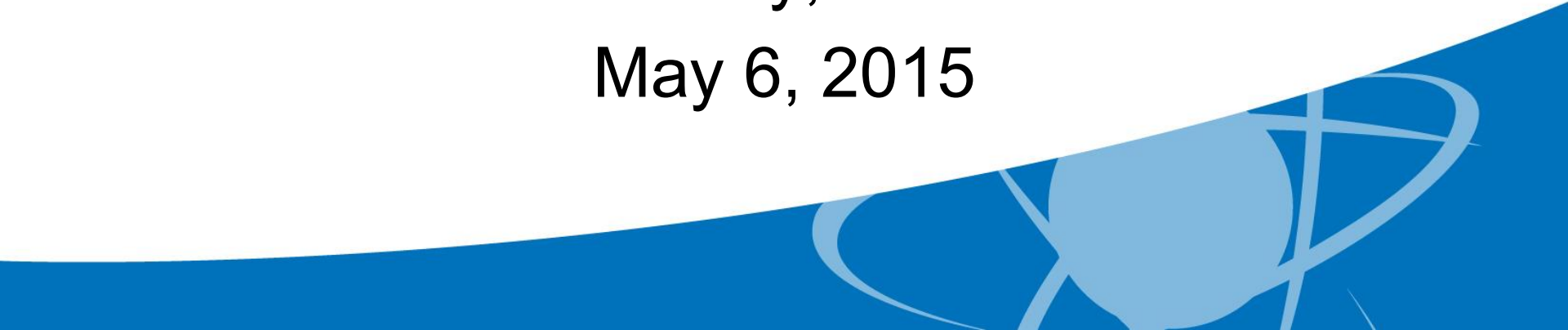
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Draft Regulatory Guide DG-1301 (*Proposed New Regulatory Guide 1.226*) Flexible Mitigation Strategies for Beyond- Design-Basis Events

Eric E. Bowman, NRR/JLD
Clinton Ashley, NRO/DSRA
May 6, 2015



Status

- In a preliminary draft form, pending finalization of industry guidance
- Final draft guide to be completed and published in conjunction with MBDBE Proposed Rule (SECY-15-XXXX)
- Builds on JLD-ISG-2012-01, taking into account lessons learned and SRM-COMSECY-14-0037

Staff Positions

1.1.a – Baseline capabilities developed following NEI 12-06, sections 1-3 provide an acceptable means for maintaining core cooling, containment and spent fuel pool cooling, but additional contingencies are necessary to mitigate the loss of all ac power. (See Staff Position 1.2.)

Staff Positions

1.1.b – Maintenance of strategies for modifications/equipment outages. Highlights the difference between 50.155(b) and 50.63.

1.1.c – Best estimates are appropriate for beyond-design-basis analyses.

1.1.d – Validation of strategy feasibility is appropriate.

Staff Positions

1.2 – Contingencies for actual loss of all alternating current power

- Manual start of AFW/HPCI/RCIC/IC
- Use of portable equipment to read instruments
- Guidance on actions without control power

Staff Positions

- 2 – NEI 12-06 guidance on equipment quality and design, as well as the provision of spare equipment, is appropriate to show the capacity and capability of the equipment.
- 3 – NEI 12-06 guidance on reasonable protection is acceptable.
- 4 – NEI 12-06 guidance on maintenance is acceptable.

Staff Positions

5 – NEI 12-06 guidance on configuration control is acceptable.

6 – Guidance on treatment of re-evaluated hazards not yet ready for discussion with ACRS.

DG-1301 Appendix A

Summary of 10 CFR 50.155 (d)

- Applicants for new reactors shall include design features in the plant design sufficient to
 - enhance coping durations and
 - minimize reliance on human actionsto maintain or restore core cooling, containment, and spent fuel pool cooling capabilities during an ELAP concurrent with a LUHS...

DG-1301 Appendix A

Regulatory Basis

- Applicants for new reactors have an opportunity to include design features in the plant design that enhance the mitigation strategies
- Consistent with:
 - Advanced Reactor Policy Statement
 - Approach for Aircraft Impact Assessments, Loss of all Alternating Current Power, and Fire Protection

DG-1301 Appendix A

Proposed Guidance

- Endorses NEI 12-06 with clarifications
- NEI 12-06 uses a three-phase approach
 - Initial phase or Phase 1
 - Transition phase or Phase 2
 - Final phase or Phase 3
- Enhancing Phase 1 is the focus for new reactor designs

DG-1301 Appendix A

Proposed Guidance – Phase 1

- Rely on plant equipment from 0 to 24 hours
- Capability to function throughout the external event
- Use modern design basis hazard analysis (e.g., flooding)
- Protection from all external hazards, regardless of warning time
- Include a safety margin for site seismic hazard
- Credit for supplemental ac after 8 hours
- Minimal operator actions at limited and protected locations

DG-1301 Appendix A

Proposed Guidance: Phase 2 and 3

- Phase 2: Use of on-site portable equipment and consumables from 24 - 72 hours
- Store on-site portable equipment in safety-related structure or within a structure designed for design-basis wind hazards; no option to credit building separation for tornado events
- Plant equipment and their connections have the capability to function after the external event
- Phase 3: Use of off-site equipment after 72 hours

DG-1301 Appendix A

Supplemental ac

- May be credited after 8 hours
- Permanently installed and normally disconnected from the bus
- Diverse and independent from the emergency ac source
- Supplemental ac source, distribution system, and loads need to show protection against external hazards

DG-1301 Appendix A

Shutdown and Refueling Modes

- Mitigating strategies for shutdown and refueling modes should be addressed at the design stage
- Positions outlined in the DG-1301 Appendix A apply to all modes, including shutdown and refueling modes

Draft Regulatory Guide DG-1317 and NEI 12-02, Revision 1 Spent Fuel Pool Instrumentation

ACRS Fukushima Subcommittee Meeting
May 6, 2015

Steven P. Kraft, Sr. Technical Advisor, NEI

Randy Bunt, Mgr. Severe Accidents, Southern Company

SFP Instrumentation Status

- March 12, 2012 – EA-12-051 issued
- August 24, 2012 – NEI 12-02 Rev 1 issued
- August 29, 2012 – JLD-ISG-2012-03 issued
- February 29, 2013 – OIPs submitted
- End 2014 – 18 Units completed
- End 2016 – All units completed
- Three vendors – all radar based technologies

NEI 12-02 Rev 1 Endorsement

- Endorsed by JLD-ISG-2012-03 with six technical clarifications and exceptions.
- To-date implementation has been moving along successfully based on the existing guidance.
- MBDBE Rule will make EA-12-051 generally applicable
- DG-1317 (as Reg Guide 1.227) will apply

DG-1317

- Repeats clarifications and exceptions in JDL-ISG-2013-03 with two differences:*
 - Reliability demonstrated *during* event (NEI 12-02)
Reliability demonstrated *during and following* event (JLD-ISG-2013-03)
Reliability demonstrated *during* event (DG-1317)
 - Recommend using JLD-ISG-2013-03 language

* DG-1317 pg.6

DG-1317

- Commercial components *shall* be considered (NEI 12-02)
Commercial components may be considered but licensees *may choose....safety-related...*(JLD-ISG-2013-03)
Commercial components *may* be considered but the licensee *should consider.....safety-related...*(DG-1317)
- * Creates regulatory creep for future actions, especially when read in conjunction with “Use by NRC” (future-fit requirements)
Inconsistent with “Reliability” Principle of Good Regulation
- Recommend eliminating or using JLD-ISG-2013-03 language

Draft Regulatory Guide DG-1317
(*Proposed New Regulatory Guide 1.227*)
Wide-Range Spent Fuel Pool Level
Instrumentation

Eric E. Bowman, NRR/JLD

May 6, 2015



Status

- Final draft guide to be completed and published in conjunction with MBDBE Proposed Rule (SECY-15-XXXX)
- Implements JLD-ISG-2012-03



Staff Positions



NEI 12-02, Revision 1 is acceptable with clarifications from JLD-ISG-2012-03:

3.4 – Shock and vibration qualification

3.4 – Seismic design/installation per IEEE 344-2004, sections 7, 8, 9, and 10 or similar industry guidance.

NEI 13-02 Rev 1

Industry Guidance to Implement EA-13-109

Advisory Committee on Reactor Safeguards
Fukushima Sub-Committee Meeting
May 6, 2015



Update from April 10, 2015 Meeting

- Issued JLD-ISG-2015-01 on April 30, 2015
 - Issued NEI 13-02 Rev 1 on April 23, 2015
 - Resolved remaining NRC staff, ACRS and stakeholder comments
 - No technical exceptions or clarifications to NEI 13-02 Rev 1 guidance

ACRS Conclusions/Recommendations¹

- Industry response to ACRS recommendations
 - Preference for RPV addition point strengthened
 - Reduces impact of uncertainties related to core relocation as water will follow debris
 - OIP template will include plant specific details to evaluate Phase 2 strategies
 - For example, spillover height, freeboard volume, addition rate based on scaling of reference plant power, debris pathway
 - EPRI technical assessments supporting CPRR did not credit drywell sprays for release reduction
 - Use of drywell sprays is considered in SAMGs using sources not required for RPV injection
 - Proposed SAMGs limit use of sources from outside containment in order to preserve wetwell vent path

Ref 1: Final ACRS letter on JLD-ISG-2015-01, April 30, 2015

Changes Since Last Meeting

- Strengthened basis for RPV as SAWA preferred addition location in Section I.1.2.1.1
 - [RPV water addition] Limits impact of modeling uncertainties related to mode of vessel breach and extent of debris spreading.

Changes Since Last Meeting (Cont'd)

- SAWA early deployment considerations added to Section 1.2
 - The analysis performed to support the SAWA/SAWM strategies established timing for specific accident sequences (e.g., RCIC failure at T=0, 1 hour to core damage, 8 hours to establish SAWA flow) that conform to the reference plant in Reference 27. **Licensees should ensure procedures and designs consider the early deployment of portable equipment to facilitate expedited water addition and to repower needed equipment and instrumentation such that no unnecessary delays in deployment are introduced into accident response. This expectation is to encourage licensees to take reasonable actions to minimize SAWA equipment deployment times,** but is not intended to drive licensees to modify existing or construct additional structures for SAWA equipment storage, or to choose alternate SAWA connections points from those used to support Order EA-12-049 compliance
 - Reinforce during industry workshops for Phase 2

Endorsement of NEI 13-02

- No technical concerns for developing the Phase 2 OIP
 - Can be used to implement the entire Order
- Sections not endorsed will still be used by the industry in support of the Order implementation
 - Generic Letter 89-16 commitment guidance
 - EPG/SAG information
 - Emergency Procedures Committee is drafting changes supporting SAWA/SAWM strategy

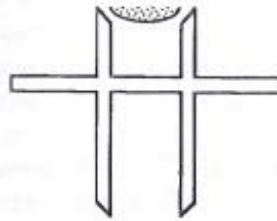
Next Steps

- Develop industry template for Phase 2 OIP
- Conduct pilot plant development of Phase 2 OIP (Mark I and Mark II plant)
- Conduct industry workshops for Phase 2 OIP development
- Submit Phase 2 OIPs by December 31, 2015

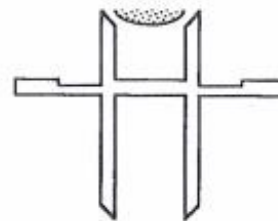
NEI 13-02 Rev 1 and JLD-ISG-015-01
reflect significant work by the NRC
staff and industry to provide the
guidance necessary to implement
EA-13-109 Phase 2

BACKUP

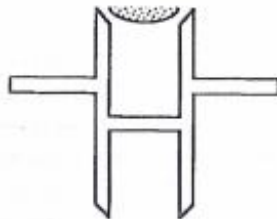
Mark II Cavity Design



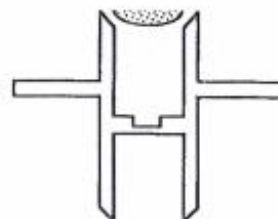
Limerick 1 & 2



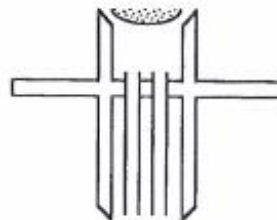
Susquehanna 1 & 2



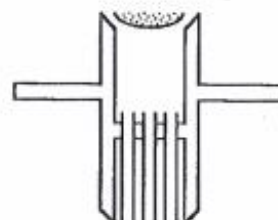
La Salle 1 & 2



WNP-2



Shoreham



Nine Mile Point

Advisory Committee on Reactor Safeguards

Mark I and Mark II BWRs
Containment Venting Systems Guidance
for Phase 2 of Order EA-13-109 and
ISG JLD-ISG-2015-01 (NEI-13-02, Revision 1)
May 6, 2015



Order EA-13-109

Phase 2 ISG Development

- Draft ISG issued for public comment – March 10, 2015
 - (NEI 13-02 Draft 0E2)
- ACRS subcommittee meeting – March 20, 2015
 - (supplemented by NEI 13-02 Draft 0F4)
- Public comment period ended – April 9, 2015
- ACRS full committee meeting – April 10, 2015
 - (supplemented by NEI 13-02 Draft 0F4 and added change table)
- Phase 2 ISG issued – April 29, 2015
 - (NEI 13-02, Revision 1; dated April 23, 2015)
- ACRS subcommittee meeting – May 6, 2015
- *Draft CPRR Regulatory Basis issued for public comment – May 2015*
- *ACRS subcommittee meeting on draft CPRR Regulatory Basis– June 25, 2015*
- Phase 2 Overall Integrated Plan Submittals – Dec 31, 2015
 - (supported by template development in Summer 2015)



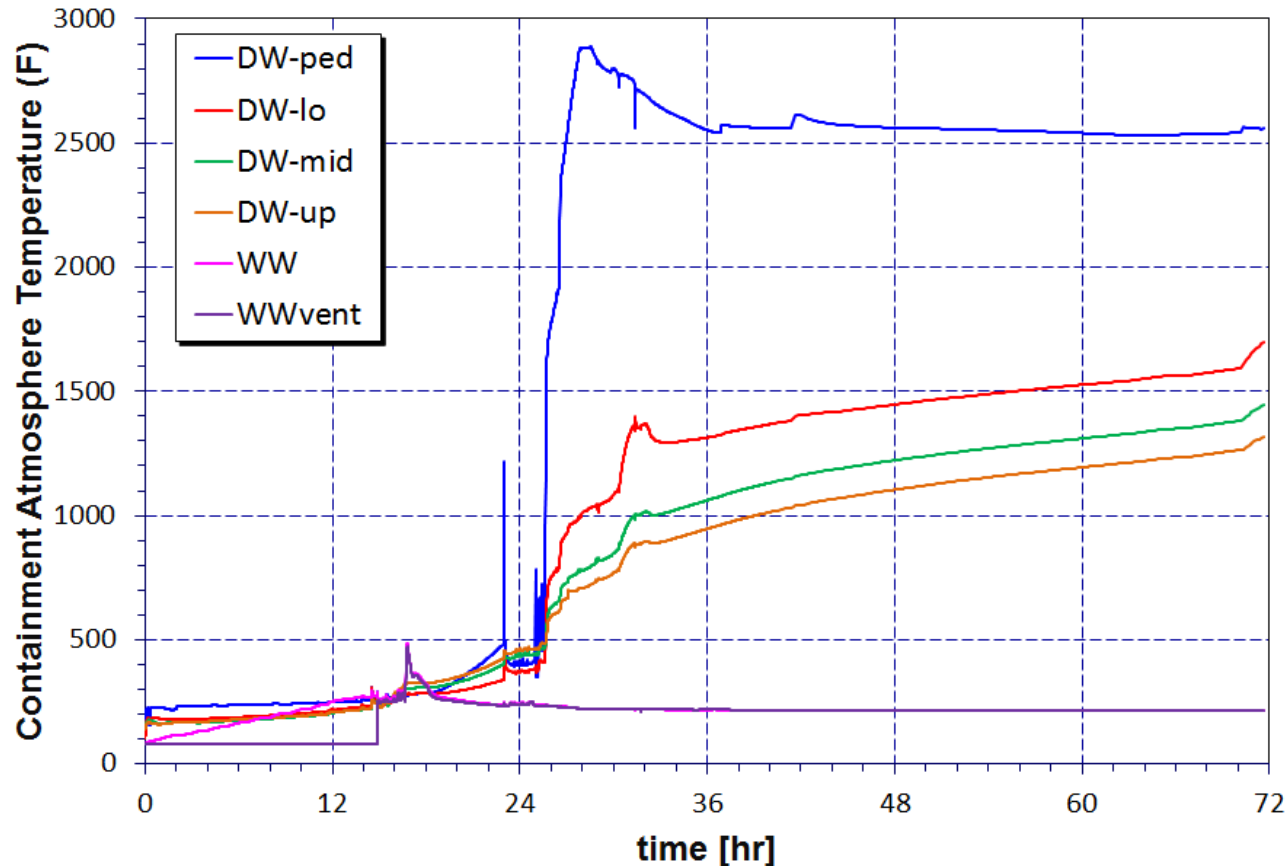
Order EA-13-109

Revisions to NEI-13-02

- Updates
 - Flammable Gases (App H & HCVS-WP-03)
 - Evaluation of Doses and Source Terms (APP F & G, HCVS-WP-02)
 - Appendix A (Glossary of Terms)
 - Instrumentation Capabilities
- Phase 2 Focus
 - Severe accident water addition (SAWA)
 - Appendix I
 - Severe accident water management (SAWM)
 - Appendix C



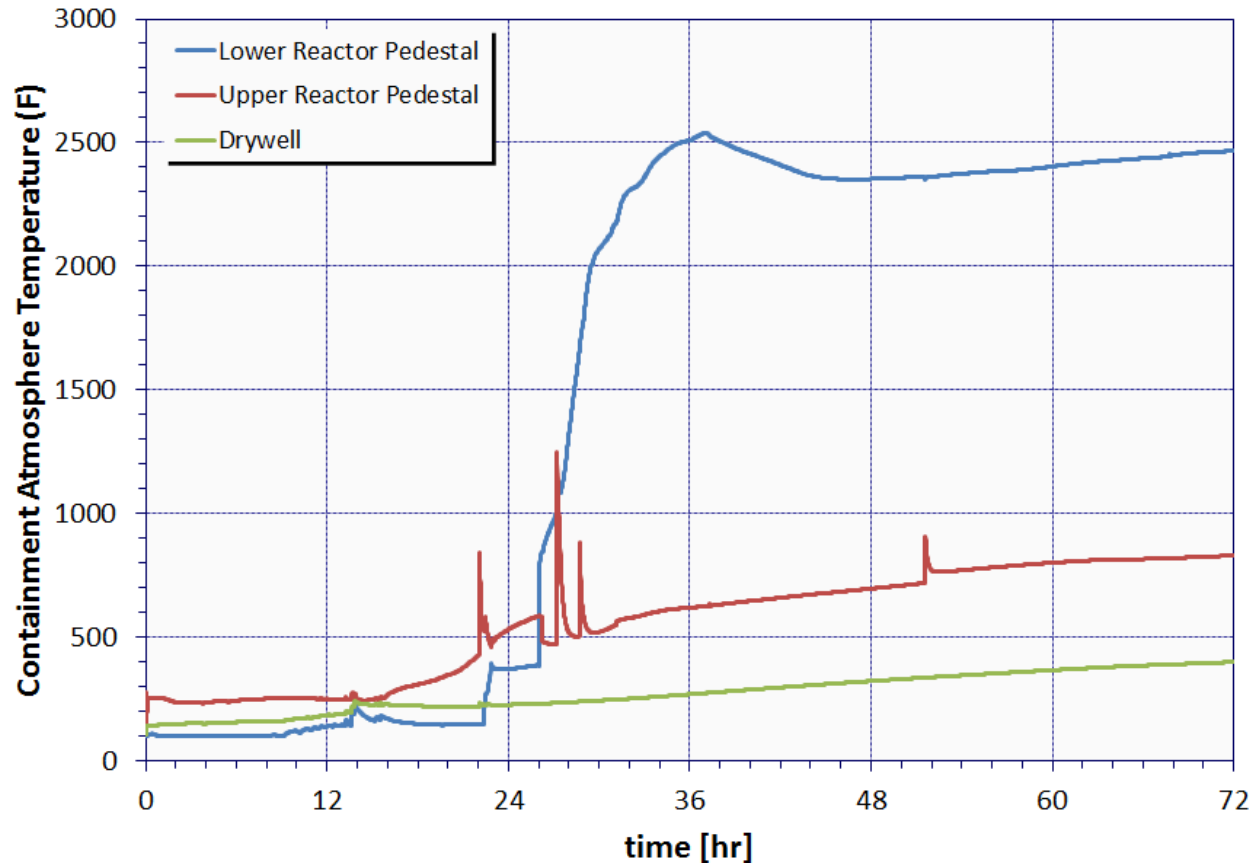
Evaluation of Drywell Temperatures (Mark I without water addition)



Mark I Containment Gas Temperature with no water addition



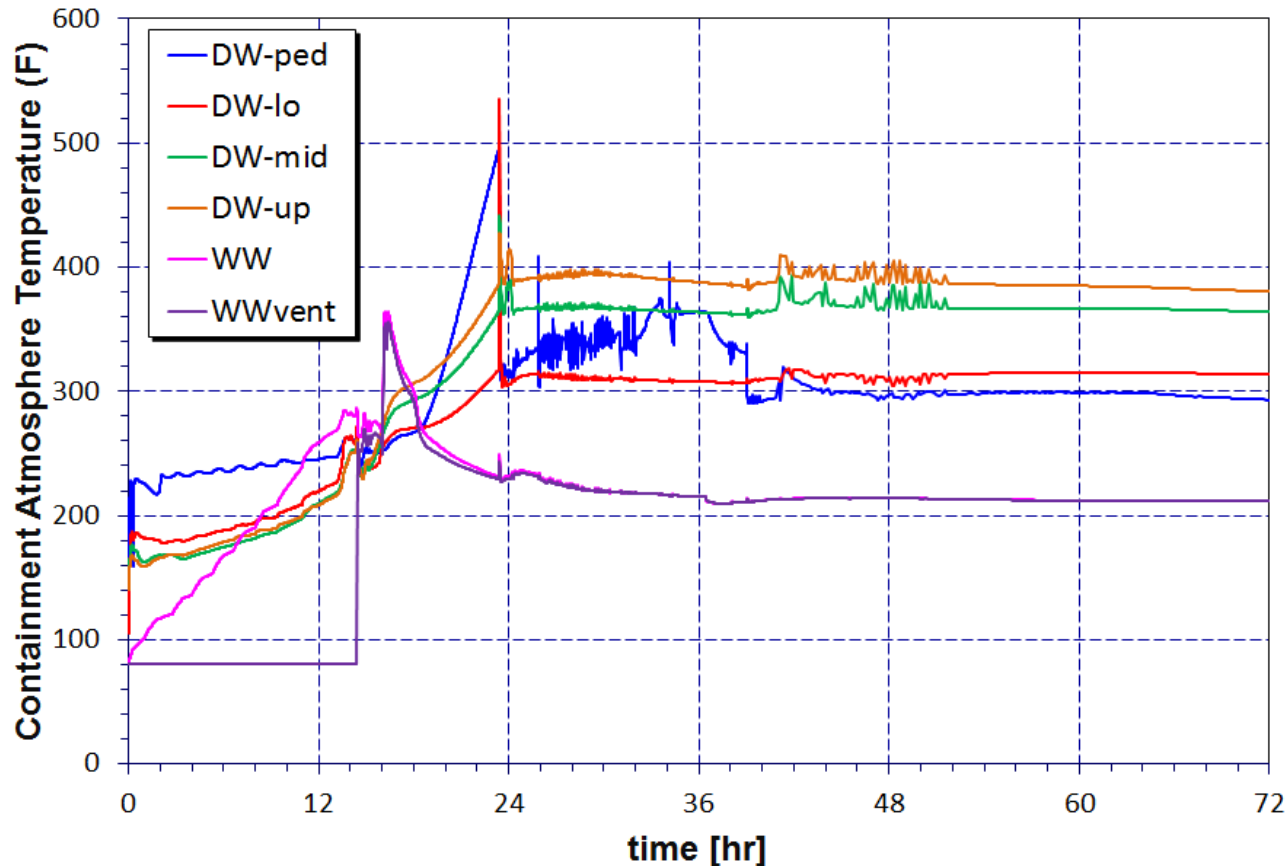
Evaluation of Drywell Temperatures (Mark II without water addition)



Mark II Containment Gas Temperature with no water addition



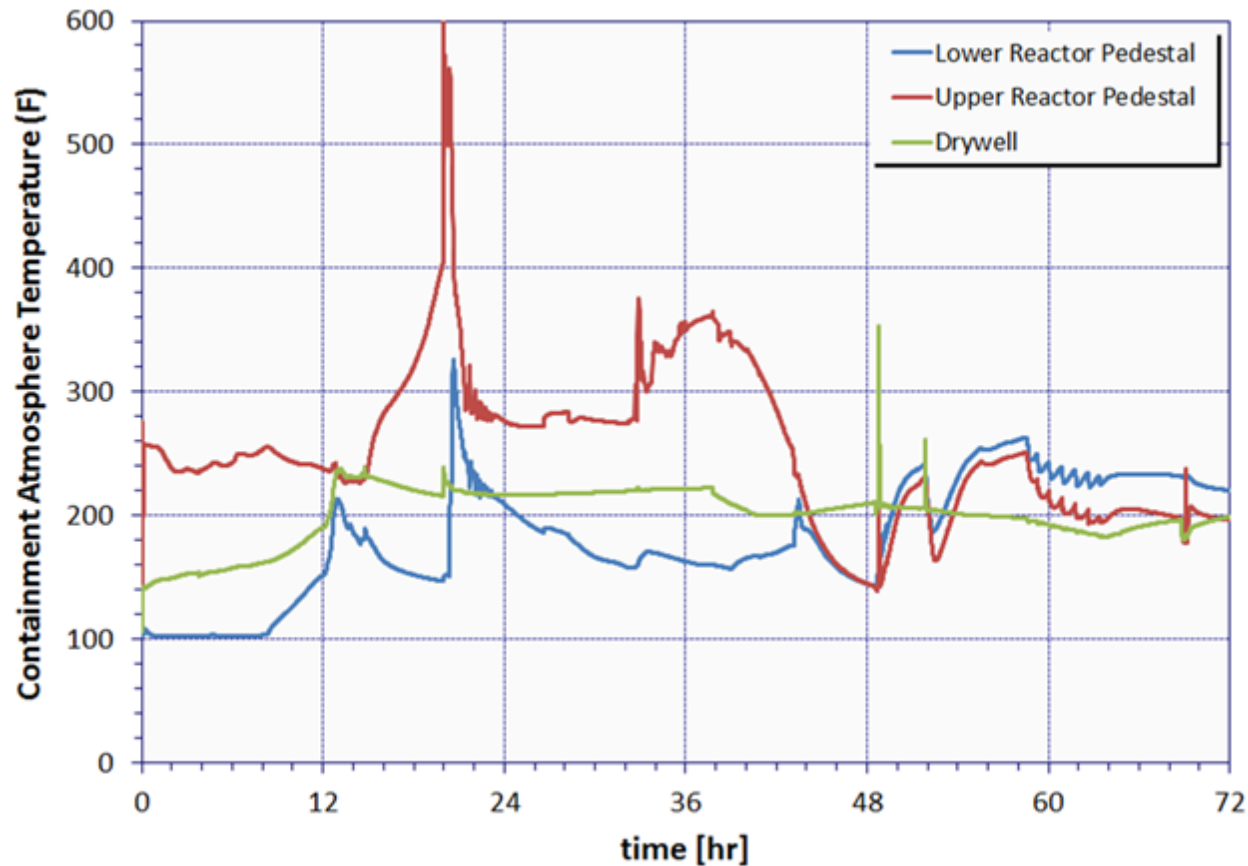
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Mark I Containment Gas Temperature with water addition
(SAWA/SAWM - SAWA only shows similar behavior/temperatures)



Evaluation of Drywell Temperatures (Mark II with water addition)



Mark II Containment Gas Temperature with water addition
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INTERIM STAFF GUIDANCE

JLD-ISG-2015-01

Resolution of Issues in Draft ISG – Method 2

- Issues in Draft ISG
 - Clarify functional requirements for SAWA provisions
- Resolution: Industry added discussion to NEI 13-02, Rev.1 regarding functional requirements for SAWA to address time sensitive actions and equipment capabilities
 - Section 4, “Design Considerations”
 - Section 5, “Programmatic Controls”
 - Section 6, “Operational Considerations”
 - Appendix I, “Severe Accident Water Addition (SAWA)”
- Issues in final ISG
 - None



INTERIM STAFF GUIDANCE

JLD-ISG-2015-01

Resolution of Issues in Draft ISG – Method 3

- Issues in Draft ISG
 - Clarify functional requirements for various SAWM approaches and coping times
- Resolution: Industry added discussion to NEI 13-02 regarding functional requirements for SAWM to address:
 - Sustained Operations (> 7 days) With Wetwell Vent
 - Sustained Operations (> 7 days) With Wetwell Vent for > 3 days with functional level description of alternate heat removal capabilities
 - Sustained Operations (> 7 days) With Wetwell Vent for < 3 days with detailed description of alternate heat removal capabilities
- Issues in final ISG
 - None



April Full Committee Meeting Conclusions and Recommendations

1. Address comments and open items identified in draft ISG before issuing JLD-ISG-2015-01
 - Addressed Comments, Final ISG Issued on April 29, 2015
2. ISG and NEI 13-02 provides reasonable guidance on a generic basis. Substantial work remains to evaluate, justify, and implement the plant-specific designs.
 - Additional information via template for overall integrated plans (OIPs) and then staff review of plant-specific OIPs



April Full Committee Meeting Conclusions and Recommendations

3. The staff addressed issues from Phase 1 reviews. Additional attention required during review of plant-specific hardened containment venting system designs.
 - Additional information via template for overall integrated plans (OIPs) and then staff review of plant-specific OIPs
4. All methods of water addition during a severe accident should be considered, including drywell sprays, to take full advantage of reductions in radioactive source terms during wetwell venting
 - Assessed pressure/temperature response and coordinating with containment protection and release reduction (CPRR) rulemaking



April Full Committee Meeting Concerns

- Regarding combustible gas controls, ACRS concerned that guidance may be too general
 - Additional information via template for overall integrated plans (OIPs) and then staff review of plant-specific OIPs
- Regarding evaluation of radiological dose, ACRS noted careful reevaluation of doses needed
 - Additional information via template for OIPs and then staff review of plant-specific information supporting OIPs



April Full Committee Meeting

Severe Accident Modeling Uncertainties

- Staff acknowledges:
 - the uncertainties in core melt progressions, and
 - ability of containment sprays to reduce source terms
- Severe accident behavior and modeling is an area of active research following the Fukushima accident
- Containment pressures and temperatures are the most relevant parameters for Order EA-13-109 and related guidance
 - Analyses and sensitivity studies support 545°F design value for Mark II containments for cases with SAWA
- Staff performed sensitivities in support of CPRR rulemaking related to radiological releases and the timing of suppression pool bypass



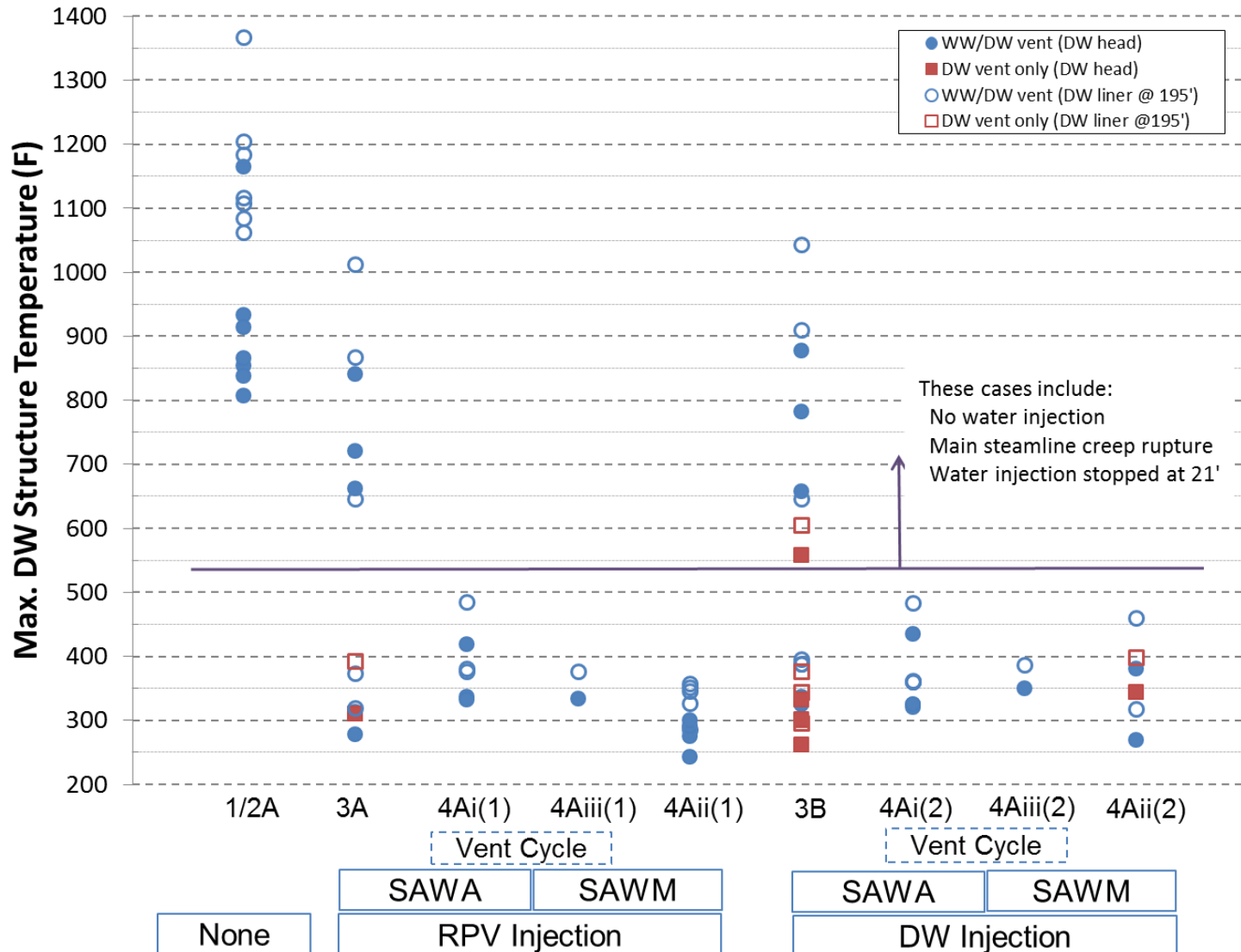
Questions & Discussion



BACKUP SLIDES

MELCOR Results for Mark I

(containment structure temperature)



Mark II Suppression Pool Bypass

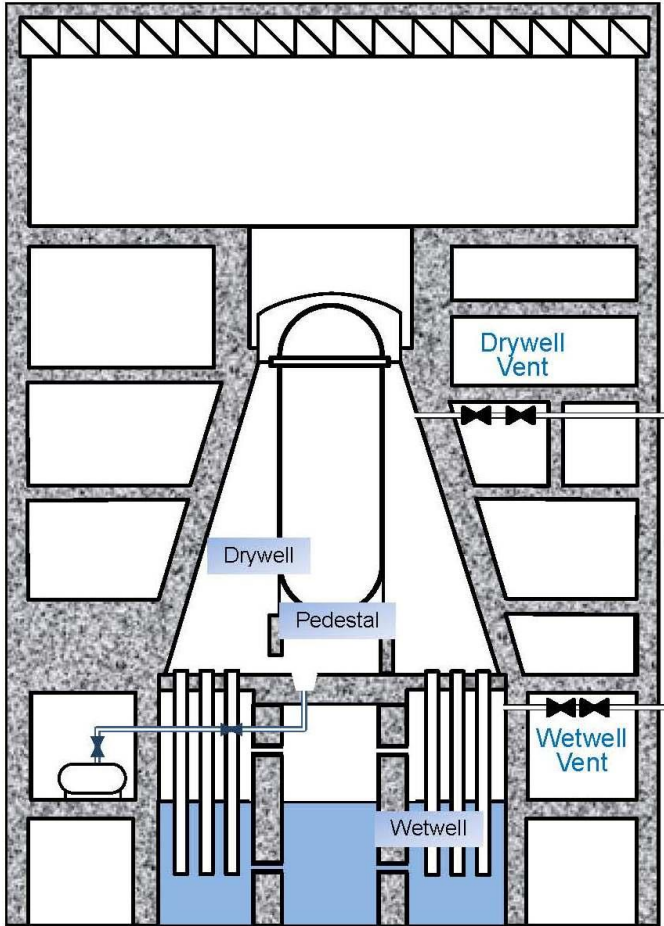


Figure 3-4
Representative Mark II containment layout

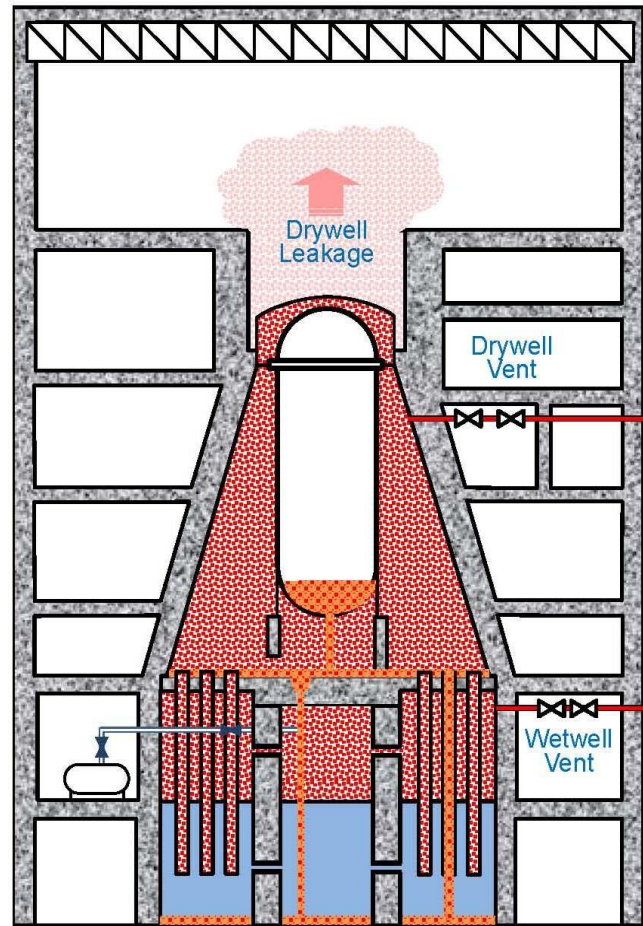
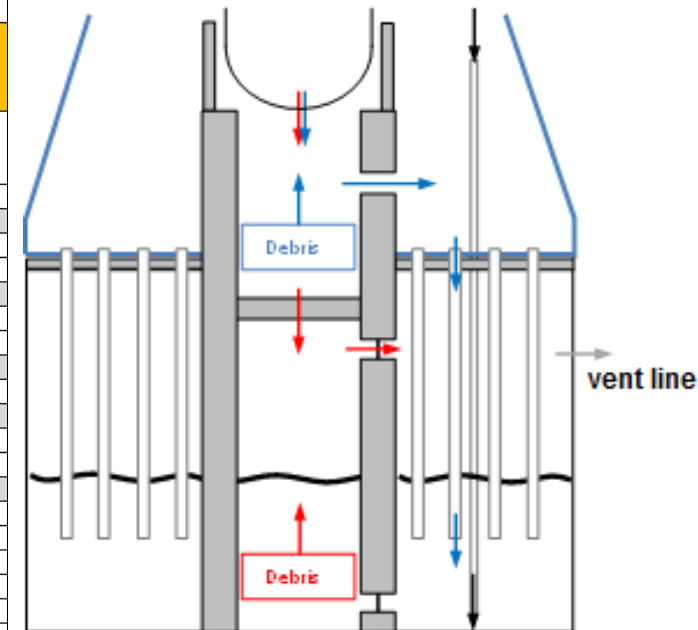


Figure 3-5
Mark II debris location



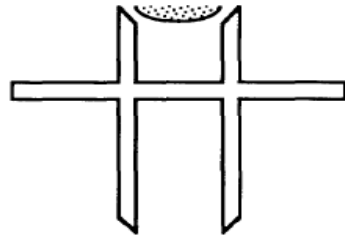
MELCOR Run Matrix for Mark II

		Pre Core Damage						Post Core Damage				
		RPV Pressure control	RCIC Operation				Anticipatory Venting	Flex Operation		SRV Operation	Venting	
		Availability (hr)	RCIC Availability (hr)	RCIC Suction	Failure Temp (F)	Open SRV after RCIC fails	Setpoint (psig)	Injection @ LH failure	SAWA Injection rate (gpm)	Allow SRV stuck open failure?	Location	Setpoint (psig)
Option	Case											
1/2A	1	72	16	SP	230	N	15	-	-	Y	WW	60
	1p1	72	16	SP	230	N	15	-	-	Y	WW	45
1/2A	3	4	4	SP	230	N	15	-	-	N	WW	60
1/2A	5	72	16	CST	230	N	15	-	-	Y	WW	60
1/2A	6	72	16	SP	230	N	15	-	-	Y	WW	30
3A	10	72	16	SP	230	N	15	RPV	500	Y	WW/DW	60
	10p1	72	16	SP	230	N	15	RPV	500	Y	WW/DW	45
3A	11	72	16	SP	230	Y	15	RPV	500	Y	WW/DW	60
	11p1	72	16	SP	230	Y	15	RPV	500	Y	WW/DW	45
3B	24	72	16	SP	230	N	15	DW	500	Y	WW/DW	60
	24p1	72	16	SP	230	N	15	DW	500	Y	WW/DW	45
3A	42	4	4	SP	230	N	15	RPV	500	N	WW/DW	60
3B	44	4	4	SP	230	N	15	DW	500	N	WW/DW	60
3B	45	-	16	SP	230	-	-	DW	500	Y	DW	60
3B	49	-	0	-	-	-	-	DW	500	Y	WW/DW	60
3B	51	-	16	SP	230	-	15	DW	500	Y	DW	15
3B	52	-	16	SP	230	-	15	DW	500	N	DW	15
Sensitivity to DW-WW bypass and lower reactor cavity (LRC) pool												
1	1a1	Same as case 1 but assuming suppression pool bypass is delayed until upper reactor cavity (URC) floor is completely ablated										
1	1b1	Same as case 1 but assuming lower reactor cavity is filled with water										
1	1b2	Same as case 1b1 but assuming immediate suppression pool bypass (0 min delay)										
1	1b3	Same as case 1b1 but assuming suppression pool bypass is delayed until URC floor is completely ablated										

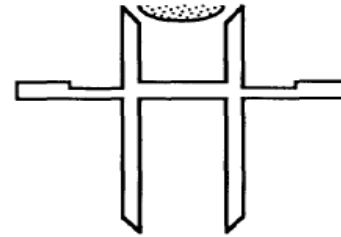


- RPV intact / SRV & SP scrubbing
- Lower head failure / DCV & SP scrubbing
- Suppression pool bypass / MCCI & overlying water scrubbing

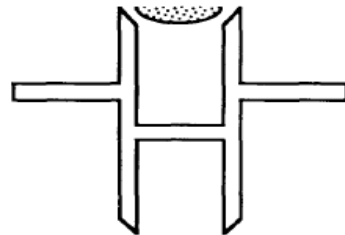
BWR Mark I/II Containment Designs



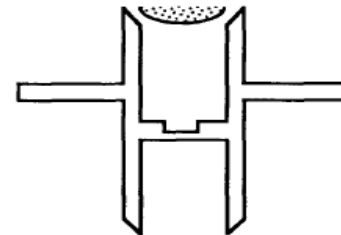
Limerick 1 & 2



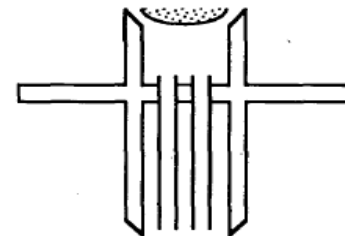
Susquehanna 1 & 2



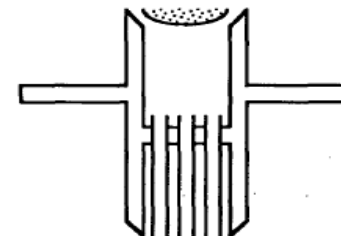
La Salle 1 & 2



WNP-2



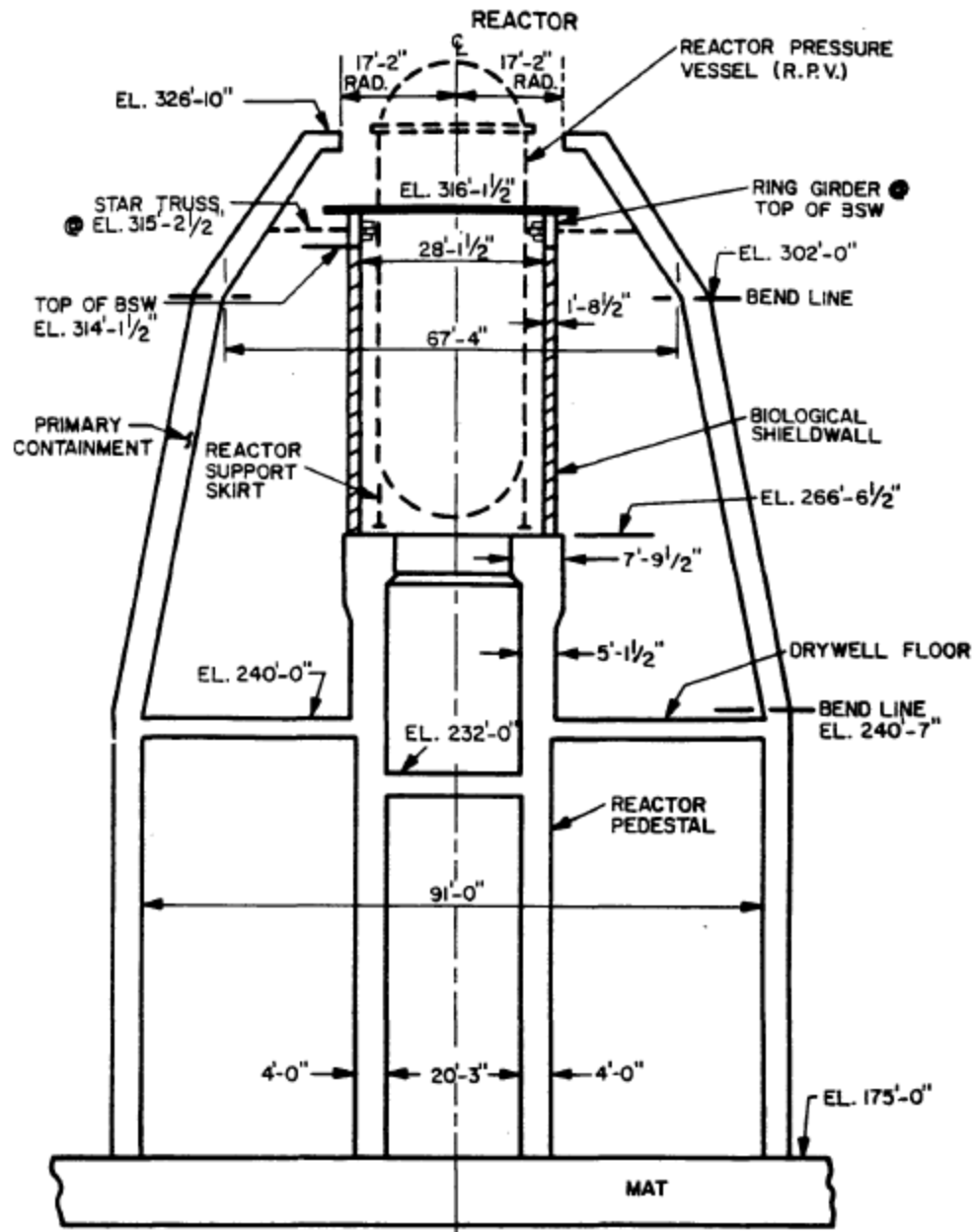
Shoreham



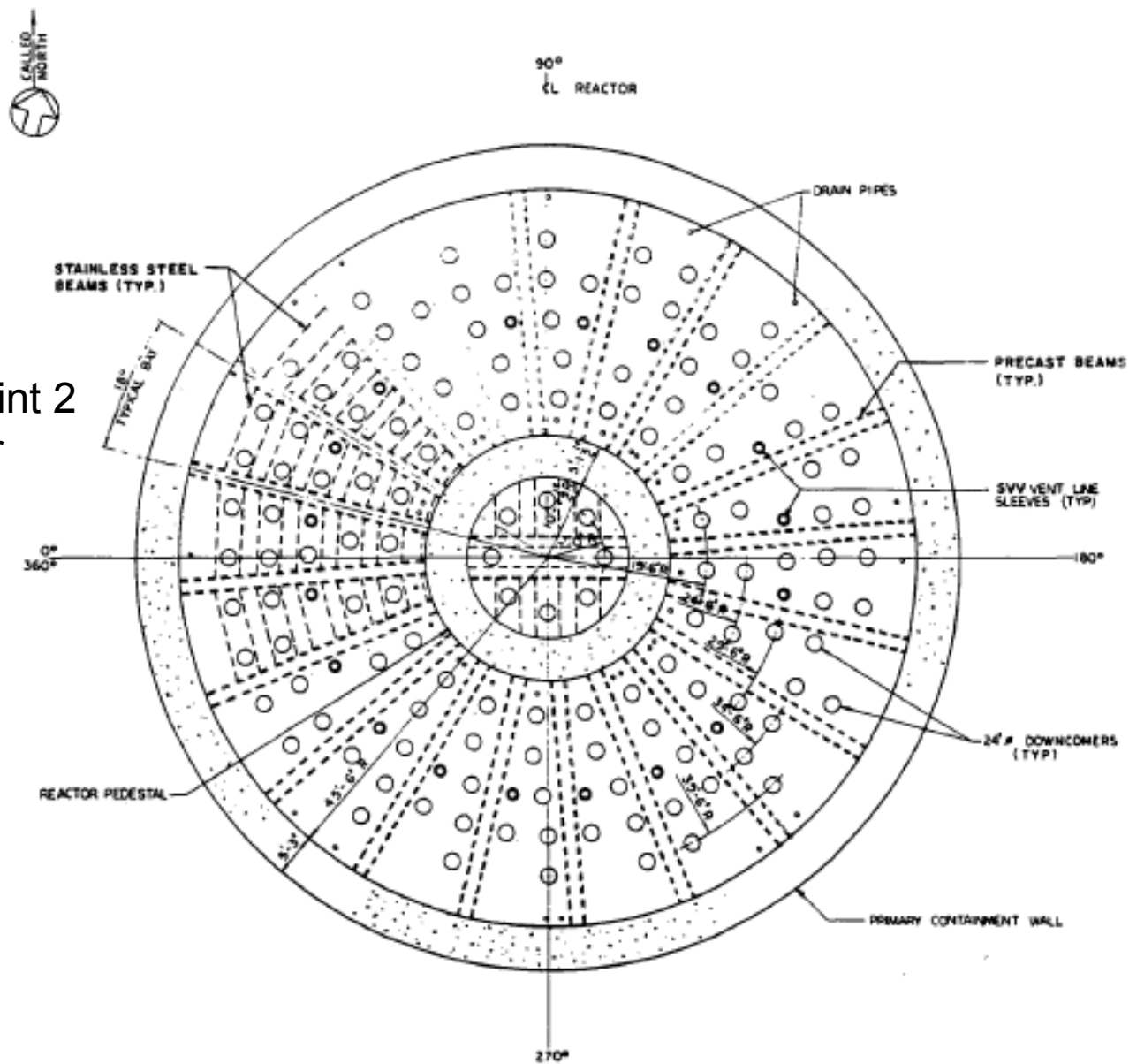
Nine Mile Point



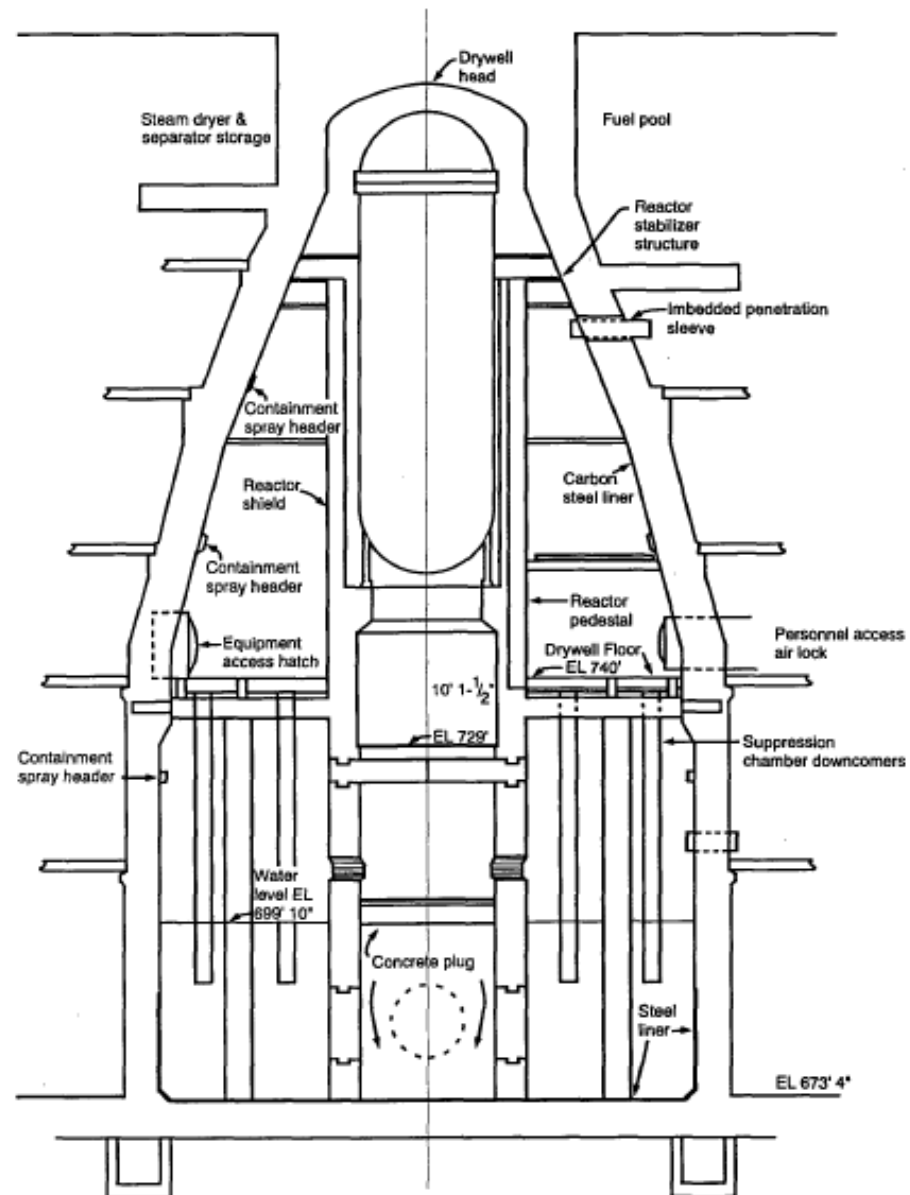
Nine Mile Point 2 Containment

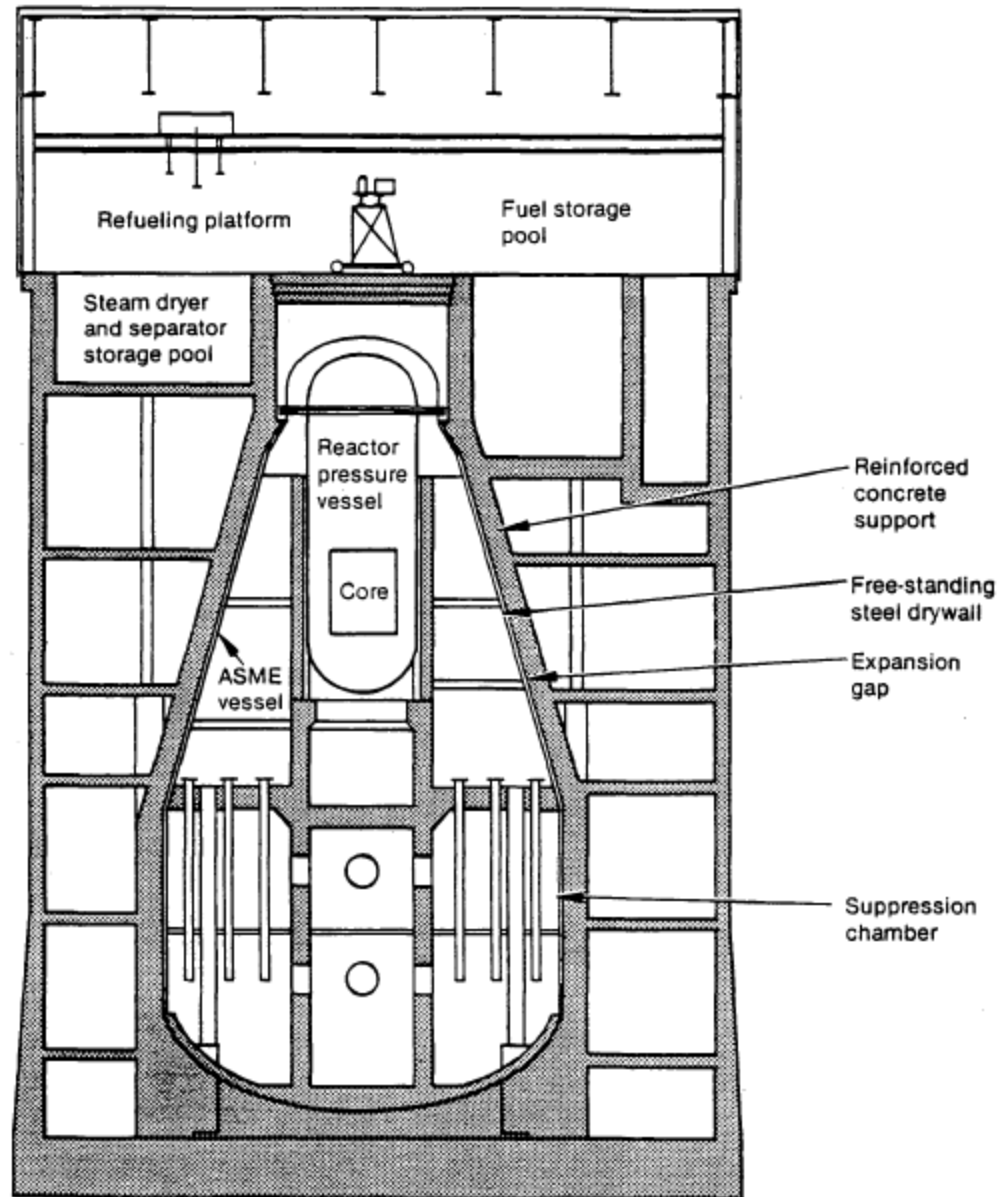


Nine Mile Point 2 Drywell Floor



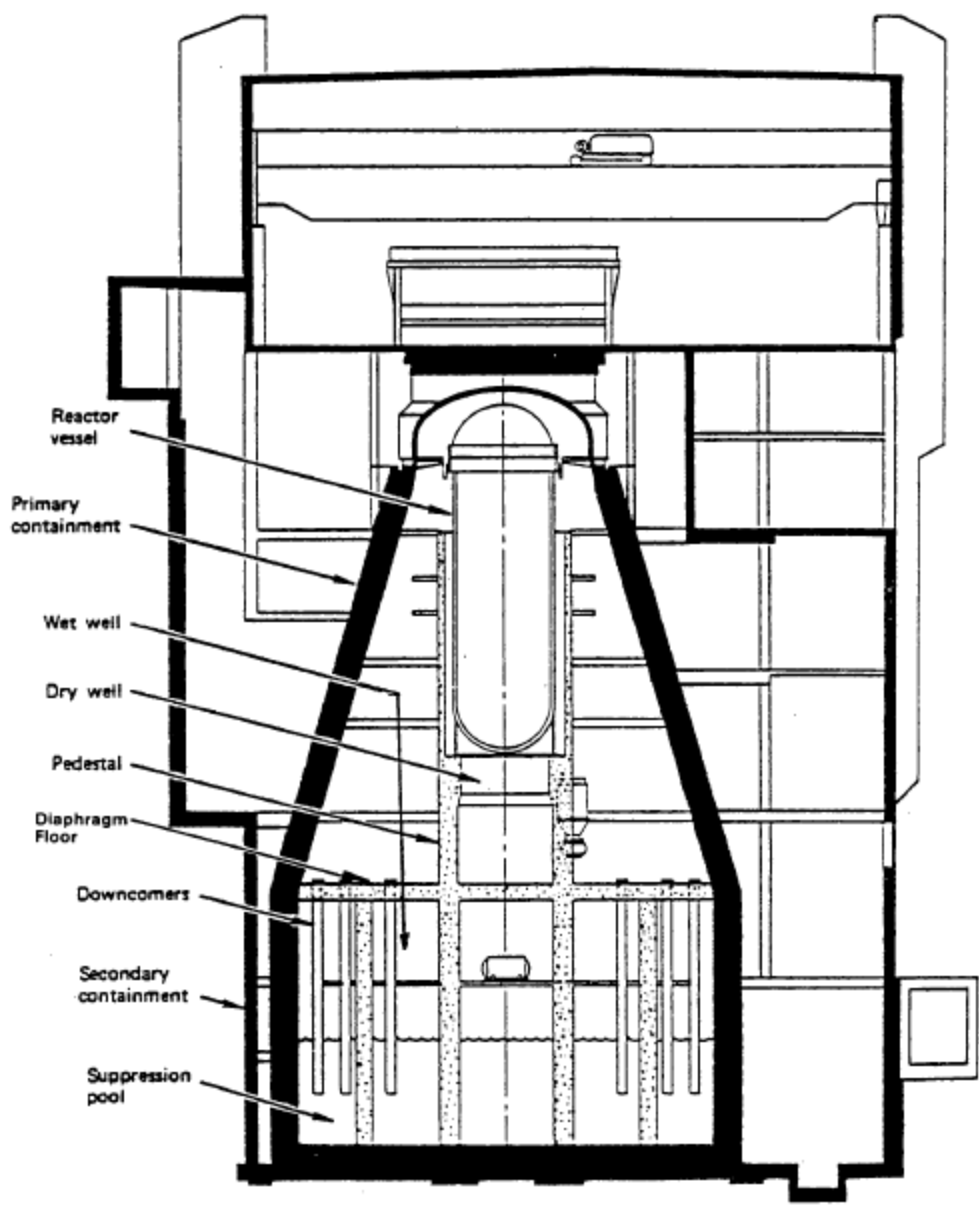
LaSalle Containment



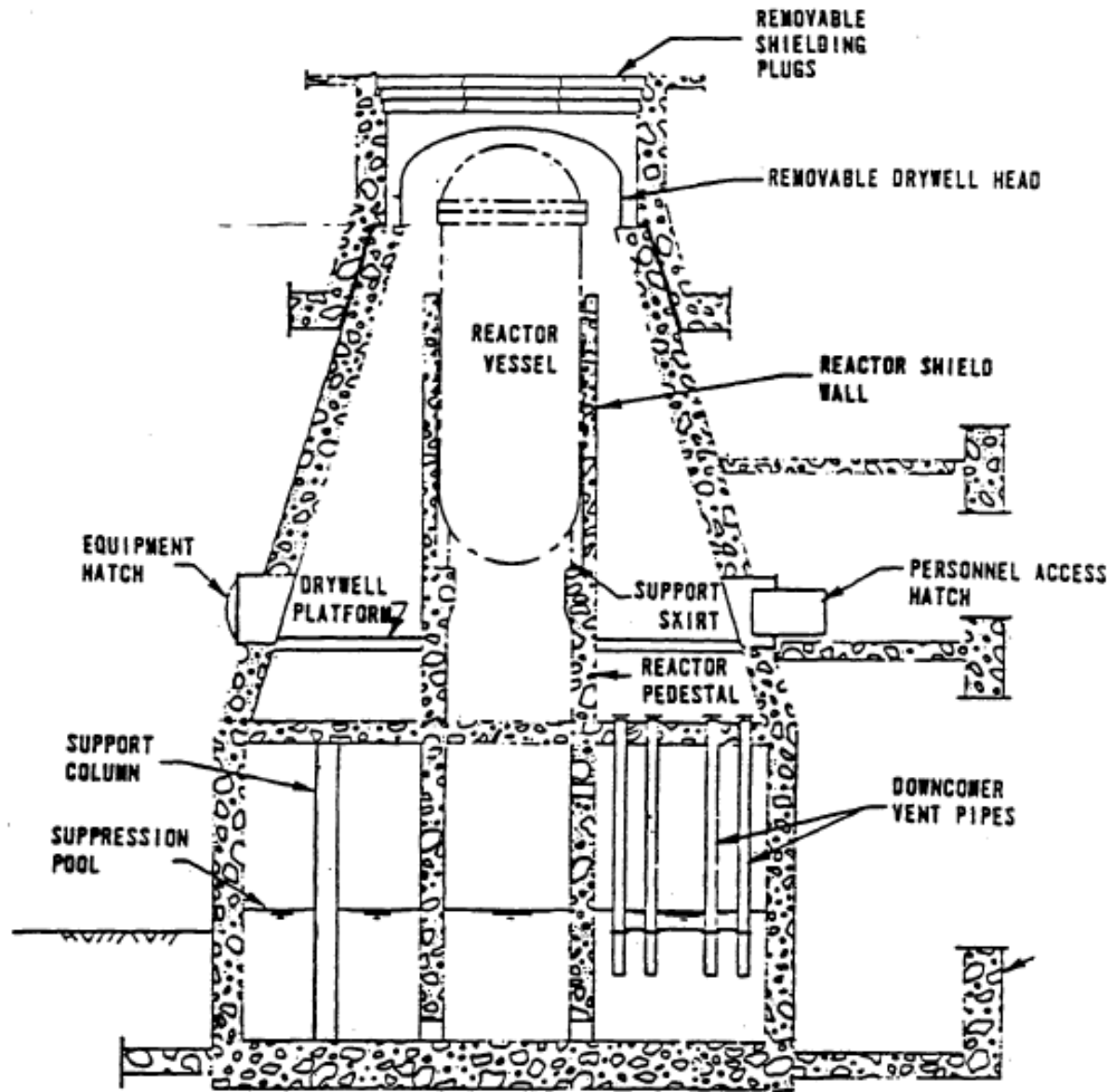


Columbia
Containment

Limerick
Containment



Susquehanna Containment



Susquehanna
Drywell Floor

