

Official Transcript of Proceedings

NUCLEAR REGULATORY COMMISSION

Title: Advisory Committee on Reactor Safeguards
 Fukushima Subcommittee Meeting
 Mitigation of Beyond Design Basis Events

Docket Number: (n/a)

Location: Rockville, Maryland

Date: Friday, April 22, 2016

Work Order No.: NRC-2329

Pages 1-257

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

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NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
(ACRS)

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FUKUSHIMA SUBCOMMITTEE
MITIGATION OF BEYOND DESIGN BASIS EVENTS

+ + + + +

FRIDAY

APRIL 22, 2016

+ + + + +

ROCKVILLE, MARYLAND

+ + + + +

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

COMMITTEE MEMBERS:

JOHN W. STETKAR, Chairman

RONALD G. BALLINGER, Member

DENNIS C. BLEY, Member

CHARLES H. BROWN, JR. Member

DANA A. POWERS, Member

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HAROLD B. RAY, Member

JOY REMPE, Member

PETER RICCARDELLA, Member

GORDON R. SKILLMAN, Member

DESIGNATED FEDERAL OFFICIAL:

MIKE SNODDERLY

ACRS CONSULTANT:

STEPHEN SCHULTZ

ALSO PRESENT:

SCOTT BAUER, NEI

ERIC BOWMAN, NRR

GREG HARDY*

STEVE KRAFT

ED LYMAN, Union of Concerned Scientists

ANDREW MAUER, NEI

MIKE POWELL, Arizona Public Service Company

TIM REED, NRR

JIM RILEY, NEI

MOHAMED SHAMS, NRR

MIKE TSCHLITZ, NEI

TOM ZACHARIAH

*participating via telephone

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P R O C E E D I N G S

8:33 a.m.

CHAIR STETKAR: The meeting will now come to order. Of course I've lost my opening statement. You can put that on the record by the way. It shows the general confusion.

As usual, the Chairman is totally disorganized and discombobulated. And here it is.

This is a meeting of the Advisory Committee on Reactor Safeguards Subcommittee on Fukushima. I'm John Stetkar, Chairman of the Subcommittee.

Members in attendance today are Pete Riccardella, Harold Ray, Dick Skillman, Dana Powers, Dennis Bley, Ron Ballinger, Charles Brown, and Joy Rempe. We're also joined by our consultant, Dr. Stephen Schultz.

The purpose of today's meeting is to continue our review of the draft proposed Rule for mitigation of beyond design basis events and the associated supporting documents and guidance.

In particular, we'll focus primarily on three Draft Regulatory Guides that the staff plans to issue with the proposed Rule. We didn't have sufficient time to discuss these Reg Guides during

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1 our previous meetings on the Rule itself. And it's
2 important for us to understand how the Guidance will
3 be implemented by the staff when licensees submit
4 their assessments.

5 This meeting is open to the public.
6 This meeting is being conducted in accordance with
7 the provisions of the Federal Advisory Committee
8 Act.

9 The rules for the conduct of and
10 participation in the meeting have been published in
11 the Federal Register as part of the notice for this
12 meeting.

13 The Subcommittee intends to gather
14 information, analyze relevant issues and facts, and
15 formulate proposed positions and actions as
16 appropriate for deliberation by the full Committee.

17 Mr. Michael Snodderly is the designated
18 Federal Official for this meeting. A transcript of
19 the meeting is being kept. And will be made
20 available as stated in the Federal Register Notice.

21 Therefore, it is requested that all
22 speakers first identify themselves and speak with
23 sufficient clarity and volume so that they can be
24 readily heard. I'll ask everyone in the room to go,
25 please check your communications devices, turn them

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1 off. Otherwise, we will destroy them.

2 We have received no written comments.
3 Dr. Ed Lyman of the Union of Concerned Scientists
4 has requested time to make an oral statement.

5 I understand that there may be
6 individuals on the bridge line who are listening in
7 on today's proceedings. The bridge line will be
8 closed on mute so those individuals maybe listen in
9 -- may listen in.

10 At the appropriate time later in the
11 meeting, we'll have an opportunity for public
12 comments from the bridge line and from members of
13 the public in attendance.

14 We'll now proceed with the meeting. And
15 I'll call upon Scott Bower to open the proceedings.
16 Scott?

17 MR. BAUER: Thank you, sir. My name is
18 Scott Bauer. I am working on loan to NEI from
19 Arizona Public Service Company. And I have been
20 doing that as a FLEX Project Manager.

21 Hopefully that tour of duty will come to
22 an end here in the near term. But, I think we've
23 made substantial progress in the industry with our
24 final units being implemented this year.

25 What I'm going to cover briefly is some

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1 of the changes that went into NEI 1206 Route 2.
2 Most of the changes have nothing to do with the
3 mitigating beyond design basis events' rule making.
4 I think the change is long term.

5 So, there were a few changes made to
6 conform the Guidance to the Rule as opposed to the
7 Orders. Then the next three bullets are really
8 changes we made as we implemented FLEX throughout
9 the industry we continued to identify issues.

10 And I'll talk through some of those.
11 So, there were a number of -- as we implemented it,
12 there were a number of NRC approved alternatives
13 that got made.

14 So, we went back and put some revisions
15 into 1206 to eliminate the need to approve
16 alternatives. We also addressed a number of generic
17 issue position papers.

18 Which I'll briefly describe what those
19 were. And then we had, over the course of the time,
20 about 32 frequently asked questions that we
21 incorporated into the document.

22 So, those three bullets there are all
23 really unrelated to the mitigating beyond design
24 basis events' rule. The final three bullets to some
25 greater extent are connected to the rule making in

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1 that we added Appendix G and H to deal with the
2 flooding and seismic reevaluated hazards.

3 And then we also -- Appendix E had been
4 approved as a -- essentially as a white paper for
5 the way the plants did their validation of the FLEX
6 implementation. We did make some additional changes
7 to it of how we would validate the reevaluated
8 flooding mitigating strategy.

9 So then at that point we added Appendix
10 Echo to the document to -- so that is now included.
11 So, the next slides are some of the changes we had
12 to make to conform the document.

13 As the other issues progressed, the
14 integration of the procedures, staffing
15 requirements, and the drills and exercises in NEI's
16 -- NEI documents 14-01, 12-01, and 13-06, we
17 incorporated those as references where applicable.

18 We also went through and to some extent
19 at this point have removed references to Orders EA-
20 12-049, 51 and 51, and the 109, EA-13-109 Order.
21 But, we still have some additional work to do there
22 when we issue Rev. 3, because we did keep some of
23 those references.

24 We also deleted Tables 1-1 and 1-2,
25 which essentially incorporated the Order language

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1 into the Guidance Document. And then we removed
2 references to the B-5-B loss of large areas of the
3 plant, 10 CFR 50.54(h)(2) rule making -- or rule.

4 So we removed those from there. So, as
5 far as alternatives are concerned, most of the
6 alternatives that needed to be approved involved
7 FLEX equipment being pre-staged or installed.
8 Because largely, the document called for FLEX
9 equipment to be portable.

10 So, we did add a provision that FLEX
11 equipment may be portable, pre-staged or installed.
12 And we further distinguished between FLEX equipment
13 and plant equipment.

14 So, we changed the definition of FLEX
15 equipment to include portable, pre-staged or
16 installed. And then for -- we referred to installed
17 equipment previously when discussing plant
18 equipment. So, we changed that to plant equipment.

19 So, there's two categories of equipment.
20 Equipment that is primarily used for the FLEX event
21 is called FLEX equipment. Equipment that is
22 installed in the plant and used for other things
23 normally is called plant equipment.

24 And that change would deal with most of
25 the alternatives that the NRC had to approve. Then

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1 as the -- as we went through the process of
2 implementing FLEX, we found a number of issues that
3 came up over time.

4 So, first of all the plants ran --
5 needed to figure out what the sequence of events
6 were in order to develop a FLEX strategy. So, the
7 plants said well, I'm going to go back to my thermal
8 hydraulic codes and run those to figure out what the
9 -- how the plant responds to the extended loss of AC
10 power event.

11 So, as we did that, we had interactions
12 with the staff on how we would use those codes, like
13 the CENTS code, the MAAP code, NOTRUMP. So, in each
14 of those cases we developed white papers saying how
15 we would use the code to model the ELAP event.

16 Got the staff to review and approve
17 that. Issued an approval. And so we incorporated
18 those generic issue papers into the document.

19 We had a paper on the National SAFER
20 Response Centers as to how they complied with the
21 Section 12.2 requirements for the SAFER Response
22 Centers, and we -- an audit was done on that.

23 And the NRC wrote an audit report
24 endorsing the completion of the National SAFER
25 Response Centers. So, a number -- all -- each of

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1 these issues, these are the 15 white -- generic
2 issue papers that were written over the course of
3 time.

4 And we incorporated those into the
5 document, in a table that looks like this. This is
6 just the first part of the table.

7 So, for battery duty cycles, we were
8 looking at well, how do you calculate the extended
9 life of a battery. We wrote guidance.

10 And then the NRC endorsed it in that ML
11 document. So, for each of those issues, the
12 industry prepared guidance and the NRC endorsed
13 that.

14 And then we had, like I said, 32
15 frequently asked questions. I've only included a
16 sample of those in here.

17 For example, questions were asked about
18 well, when I start my analysis, do I have to assume
19 the Tech Spec minimum conditions for operability as
20 the starting point? And we basically said no. You
21 do not need to.

22 So, an example for that is my condensate
23 storage tank is normally maintained at six hundred
24 thousand gallons, but my tech -- my analysis is at
25 like four fifty, starts at four fifty.

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1 Do I need to assume four hundred and
2 fifty gallons -- or four hundred and fifty thousand
3 galls are available at the start of the FLEX event?

4 We said no. If you have plant
5 procedures that control it, being maintain full, you
6 start there.

7 We originally said that plant equipment
8 could not be credited if it was not robust for all
9 of the screened in hazards, flooding, seismic, wind,
10 etc. But then we said well, some plants wanted to
11 use fire pumps for a flooding event and it didn't
12 have anything to do with it, it wasn't seismically
13 qualified.

14 But we said yes, it would be available
15 in a flood. So, you could credit it for whatever
16 hazard it was robust for. So, stuff like that is
17 what we clarified in the frequently asked questions.

18 Section 5.3.3.1 here, the last item in
19 this page, we looked at the containment -- you know,
20 we had a requirement in there to take all -- to have
21 the capability to take alternate instrument readings
22 at the containment penetrations.

23 Well, as the plants implemented, they
24 found well, the containment penetrations sometimes
25 weren't accessible. They were covered in insulation

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1 that would be very difficult to perform that.

2 So, we modified that provision to say
3 you could take it at the containment penetration or
4 at the first junction point outside of the
5 containment penetration.

6 So, stuff like that as we went through
7 the implementation process, we found that some of
8 the things we had in there were very difficult to
9 implement, if not impossible. And so we modified
10 those.

11 And then one of the areas we continually
12 had lots of questions on, was how to implement the
13 provisions for reasonable protection for high winds.
14 And so we went in and added additional guidance as
15 to how you determine tornado separation distance.

16 We added a provision that that
17 separation criteria could also be applied to
18 installed equipment. So, if a plant had two
19 installed condensate storage tanks with sufficient
20 separation, you could credit one of those surviving
21 a tornado event.

22 And then we added a Section 7.31 too, to
23 basically give a lot of examples as to how to apply
24 the reasonable protection criteria for the tornado
25 winds.

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1 And then as I mentioned, we added these
2 three Appendices.

3 MEMBER RAY: Can we ask you a question?

4 MR. BAUER: Yes, sir.

5 MEMBER RAY: It's not a frequently asked
6 question maybe. But it's on frequently asked
7 questions.

8 You said that fire pumps that aren't
9 seismic are qualified to be used in a flood for the
10 logical reason that they aren't -- the flood isn't a
11 consequence presumably of an earthquake.

12 Is there any consideration of floods
13 that are a consequence of an earthquake? Or is that
14 just two things that are too disconnected?

15 MR. BAUER: We did not take two events
16 simultaneously.

17 MEMBER RAY: Okay. So, an earthquake
18 that was the cause of dam failure that would result
19 in a site flooding event, that's not part of the --

20 MR. BAUER: Well, so either the
21 earthquake caused the ELAP or the flood will cause
22 the ELAP. But not both.

23 MEMBER RAY: But the earthquake can't
24 cause the flood in this model?

25 MR. BAUER: No.

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1 CHAIR STETKAR: It cannot. That is
2 explicitly excluded. I want this on the record for
3 a variety of reasons.

4 MR. BAUER: We don't require the plants
5 to deal with two events simultaneously.

6 CHAIR STETKAR: That's not a two event
7 simultaneously. It is a consequence of a single
8 event.

9 MR. BAUER: Right.

10 CHAIR STETKAR: It's an earthquake --
11 let's be very clear. I have a site that has an
12 upstream dam. An earthquake causes that dam to fail
13 and it also affects the site.

14 The failure of the dam causes a wall of
15 water to come down the river and it floods the site.
16 Does your analysis account for those conditions?

17 This is a yes or no.

18 MR. BAUER: No.

19 CHAIR STETKAR: Thank you.

20 MR. BAUER: Thank you, sir. Well that's
21 --

22 CHAIR STETKAR: I was going to bring it
23 up, but I'm just --

24 MR. RILEY: Well, let me -- Hi, I'm Jim
25 Riley, I'm with the Nuclear Energy Institute. And I

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1 can tell you that the scenario you outlined is one
2 of those evaluated for the flood reevaluations done
3 in accordance with the 50.54(f) letter.

4 That the failure of dams for those sites
5 that are affected by dam failures would have to
6 consider that flood that's caused by a seismic
7 event.

8 And then the next point I would add to
9 that is the guidance that we've put in for Appendix
10 G has you looking at the reevaluated hazard that you
11 compute as a part of the 50.54(f) response to ensure
12 that mitigating strategies will continue to operate
13 in accordance with Appendix G in the way that we've
14 outline, and I'll talk about later.

15 So, in that regard, we accommodate the
16 dam failure as part of the flood evaluation. And
17 then the flood --

18 MEMBER RAY: But Jim, Fukushima was a
19 flood not caused by dam failure. But it was caused
20 by an earthquake.

21 And so all I'm saying is that to just
22 blanket eliminate it as two separate events, just
23 doesn't seem obviously legitimate.

24 MR. RILEY: Well, we got moving on the
25 dam failures. But, the other thing that needs to be

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1 considered for the flooding reevaluations or seismic
2 tsunamis that are caused by a flood, --

3 MEMBER RAY: In which case it's an
4 earthquake causes the flood. I mean, that's --
5 there's two examples here that John and I have
6 given.

7 It just seems like as Scott was going
8 through this in his presentation that it was a
9 reasonable question to say how about events that are
10 -- one is caused by the other.

11 And you've made clear I think enough
12 that you don't make that connection. I'm not sure
13 what you're saying about a tsunami induced by an
14 earthquake.

15 MR. RILEY: Well again, I'll go back to
16 the what was required for the plants to evaluate as
17 part of their flooding reevaluations. And they had
18 to consider flooding from dam failures, which could
19 be caused by seismic events.

20 And for those plants that could be
21 affected by tsunamis, they had to consider the
22 possible -- the tsunami effects on the plant caused
23 by an earthquake.

24 MEMBER RAY: So, you think that they
25 would look at the effect of the earthquake in the

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1 example that Scott used, on the fire protection.
2 Even though they're not required to?

3 You think they would do that. That's
4 what I'm inferring from what you're saying.

5 MR. RILEY: I mean, I don't know about
6 fire protection.

7 MEMBER RAY: But you talked about fire
8 protection.

9 CHAIR STETKAR: Let's -- Harold, let me
10 --

11 MEMBER RAY: Yes, go ahead.

12 CHAIR STETKAR: Let me give them a real
13 specific thing. The concern that I've had, and I
14 was going to wait until G and H. But, since we have
15 it out on the table, we might as well discuss it
16 now.

17 Is that if I look at the -- if I now
18 look at the increasingly focused assessments that
19 are laid out in Appendices G and H, one for
20 flooding, one for seismic. And I look -- I don't
21 know what people are doing, but I think about what
22 people might do.

23 If I have two sets of FLEX equipment at
24 my plant, if I do an Appendix G evaluation, I can
25 give up on one of those sets if it's not protective

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1 for flooding, as long as I have sufficient warning
2 time to move it. Or if the other set is protected
3 against flooding.

4 I can do the same thing in Appendix H.
5 So, now I have two sets. One of which is protected
6 against seismic but not floods. The other is
7 protected against floods but not seismic.

8 I now have a seismic event that causes a
9 flood. What do I do? What do I do in my
10 assessment?

11 MR. RILEY: I think the answer to your
12 question is going back to what I said. When plants
13 perform their reevaluated hazards, the flooding
14 hazards they have to consider include those that are
15 caused by seismic events.

16 That's right. But the guidance does not
17 say also consider the possible effect of seismic
18 damage at the site that could be directly associated
19 with that event.

20 Because it's true, regardless of the
21 cause of the flood, I can assess if it's a dam
22 failure whether I have warning time or things like
23 that. But, there's nothing to say that if there is
24 coincidence seismic damage, and these are not random
25 independent events.

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1 There's a direct cause and effect
2 relationship. That I also need to consider when I
3 do my now site specific, focused evaluation of my
4 strategy, then I need to consider the fact that that
5 could have involved also seismic damage on the site.

6 I may still have a warning time. But,
7 there might be stuff that has fallen down around my
8 ears that for example, damaged the equipment that I
9 was planning to move up the hill.

10 DR. SCHULTZ: And so the question is,
11 why not?

12 CHAIRMAN STETKAR: And the question is
13 why not?

14 DR. SCHULTZ: I mean, it's as simple as
15 that. Because this is what we're here about. To
16 make sure that we can cover an eventuality as John
17 has indicted.

18 And I think we can all admit, this is
19 one event. It's a seismic event.

20 MR. RICHARDS: So, if I might --

21 CHAIR STETKAR: Yes, just turn your --
22 at the base toward you, there's a little thing that
23 says -- there you go. Thanks.

24 MR. RICHARDS: Thank you very much.
25 John Richards with EPRI. If I might comment on

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1 this, I would say that there's a -- the high ground
2 motion plants are doing seismic PRAs in response to
3 the 50.54(f) letter.

4 And many of those plants that have the
5 kinds of situations you're talking about are
6 considering the seismic induced dam failures within
7 their PRAs.

8 CHAIR STETKAR: It's good if they get to
9 the -- I mean, if that's the approach they're
10 taking. I'm equally questioning the folks who don't
11 chose to or don't see the need to implement a full,
12 you know, risk-informed approach.

13 In other words, that they want to
14 establish focused approaches that meet the earlier,
15 I don't want to call them screening, the earlier
16 acceptance paths.

17 MR. RICHARDS: I understand.

18 MEMBER RICCARDELLA: You know, we got
19 into the discussion because it was mentioned that if
20 you have a piece of equipment that's qualified for
21 flooding but not for seismic, you can use it in the
22 event of flooding events. Right?

23 And there was fire protection equipment.
24 And if you have a situation where a flood is caused
25 by an earthquake as John said, would you then

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1 disqualify that equipment in the analysis because
2 there was an earthquake?

3 CHAIR STETKAR: I understand the
4 question. Good question.

5 MR. BAUER: So, the plans -- let me just
6 restate. We did not -- the plants did not design
7 FLEX for an earthquake that causes an extended loss
8 of AC power. They would have the capability to
9 respond to that.

10 But, they didn't do that. And then on
11 top of that, take a flood in addition to the seismic
12 event.

13 MEMBER RICCARDELLA: In general, we
14 understand that. But, there's a few specific floods
15 that maybe, you know, it's probably a limited number
16 of cases. But, that probably should be considered.

17 MR. BAUER: All right --

18 CHAIR STETKAR: I was going to wait
19 until -- sorry, I was going to wait until Appendix G
20 or H. But Harold, thank you.

21 MEMBER RAY: Well, I mean, Scott said
22 something. And I just thought going back to what he
23 had said through some other route later on was more
24 difficult than I could fulfill.

25 So, anyway, it's clear I think with what

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1 you said. I'm a little uncertain still about Jim's
2 description of the fact that people take things into
3 consideration or even the PRA doesn't satisfy my
4 question yet.

5 But, let's go on.

6 MR. BAUER: Okay. So, I'm going to turn
7 it over at this point to Mike Powell who's going to
8 talk about --

9 CHAIR STETKAR: Scott, before we get to
10 the individual Appendices, I had only one other
11 question. But kind of a broader.

12 I noticed when I read through Rev. 2
13 that in terms of fuel pool cooling strategies, you
14 removed the spray strategy. Was there, you know,
15 where you spray partially uncovered fuel.

16 The implication right now is that the
17 fuel will always remain fully covered. Was there a
18 distinct intent? And what was the rationale for
19 removing that option?

20 MR. BAUER: Yes. That was somewhat of a
21 last minute change. But, the spray capability is
22 still required by the B.5.b. Or Appendix -- or 10
23 CFR 50.54(h) (h) (2) requirement.

24 So, we're not really eliminating the
25 spray capability.

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1 CHAIR STETKAR: Oh.

2 MR. BAUER: Okay. That was -- really
3 what we had done was we had said, hey, the spray
4 capability exists over here. We carried it into
5 12.06.

6 CHAIR STETKAR: Oh. Okay. Thank you.
7 That helps an awful lot.

8 MR. BAUER: Oh, okay.

9 CHAIR STETKAR: Because kind of in the
10 bigger picture of things of, you know, how stuff
11 moved around, I sort of noticed that.

12 MR. BAUER: So the rest of the story
13 though is, first of all when we did that with the
14 latest version of the ISG, the staff rejected that
15 change.

16 CHAIR STETKAR: I saw that. That's why
17 I wanted to ask you about why it disappeared.

18 MR. BAUER: Yes. Pending -- they did --
19 they rejected it pending. The plants doing spent
20 fuel pool seismic analysis.

21 Which EPRI is in the process of
22 approving the methodologies to do that. Once
23 they've done it and show that essentially losing
24 inventory from the spent fuel pools through a
25 seismic event is so minimally -- had such as minimal

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1 risk.

2 But then they can invoke the change that
3 we put in 12.06 to not have that spray capability as
4 part of the FLEX.

5 CHAIR STETKAR: Are those licensees,
6 when they do those seismic evaluations, I've seen
7 the stuff that has been done to support other issues
8 on fuel pools.

9 The question I've always asked is, do
10 you do those analysis also during refueling when
11 transfer gates maybe open? Both between segments of
12 the pool so that you've got full segments that are
13 now -- can communicate. And transfer gates into the
14 containment.

15 Just I was involved in one study not in
16 the U.S., overseas where there was a seismic
17 vulnerability when the fuel transfer gate was open
18 and you could drain the fuel pool not entirely to
19 uncover fuel. But at least down to the levels of
20 the slots between the pool.

21 Such that your boil off time then was
22 substantially reduced. In other words, your time
23 for mitigating, for make up, you know, was
24 substantially reduced compared to normal level.

25 And as long as those integrated seismic

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1 assessments are looking at also those conditions
2 during shutdown where you might be vulnerable to a
3 seismically induced partial drain down. Not direct
4 uncovering of fuel.

5 MR. BAUER: I'll let Andrew or --

6 CHAIR STETKAR: I want to make sure
7 people are looking at that.

8 MR. BAUER: Because that's because
9 they're the authors of this.

10 MR. RICHARDS: Yes, again John Richards
11 with EPRI. The evaluations that are being done are
12 using the -- they're in response to the 50.54(f)
13 letter.

14 And they are using the criteria in what
15 is affectionately known as the SPIG, the EPRI
16 document. And they are -- the going in criteria is
17 that the plant is at power.

18 So, those spent fuel pool evaluations
19 are not considering outage type conditions.

20 CHAIRMAN STETKAR: Well, that's
21 interesting. I didn't know that. Because I thought
22 that we were evaluating all possible conditions of a
23 power plant rather than just only at power.

24 MR. RICHARDS: So, the idea is --

25 CHAIR STETKAR: Okay. Well, we have the

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1 comment on the record.

2 MR. RICHARDS: The idea is, what is --
3 we have completed criteria for doing that for three
4 quarters of the plants. And there are effectively
5 the only seismic related losses of inventory are
6 sloshing for those plants.

7 And then we're into the process now of
8 the higher GMRS plants. And of putting together the
9 evaluation criteria for that.

10 MEMBER BLEY: Just so I get the end of
11 it, it's sloshing or spray-like conditions are being
12 examined?

13 MR. RICHARDS: They are.

14 MEMBER BLEY: Okay.

15 MR. RICHARDS: Yes. They're included in
16 the evaluation. And those evaluations for those
17 plants, that criteria has been endorsed by NRC.

18 And those evaluations are underway now.

19 CHAIR STETKAR: But again, only for the
20 condition where the pool is absolutely intact and
21 only during full power operation.

22 MR. RICHARDS: Yes, sir.

23 CHAIR STETKAR: Not if you have a shared
24 pool and one of your other units are in shut down?
25 For example, there are sites that have shared pools

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1 between two units.

2 And one unit can be in refueling. The
3 other one can be at power. We're doing this on a
4 unit by unit basis?

5 MR. RICHARDS: They're at power.

6 CHAIR STETKAR: Okay.

7 MR. RICHARDS: Yes.

8 MR. BAUER: Okay. Let me introduce Mike
9 Powell. He's the Director of Fukushima Initiatives
10 from Arizona Public Service Company.

11 Mike's been a part of the core FLEX Task
12 Force for -- essentially the entire duration of the
13 activities we've been involved in since it was
14 formed. So, the development of NEI 12.06 and
15 following.

16 And what we would do is we would form
17 small sub-teams to work on particular issues. And
18 one of them was, we said well, how are we going to
19 validate that these strategies actually work when
20 they're done?

21 So, Mike was part of the team that put
22 together the validation strategy. And he's going to
23 give the overview of what Appendix E did and how we
24 implemented that.

25 MR. POWELL: Good morning, I'm Mike

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1 Powell. To give you some background, NEI 12.06,
2 Section 11.4.3 which is the section on development
3 of the guidance for the FSGs had a requirement in
4 there that the FSGs should be reviewed and validated
5 by the involved groups to the extent necessary to
6 ensure the strategies are feasible.

7 Validation could be accomplished by
8 walkthroughs, drills of the guidelines, et cetera.
9 When we were -- initially particularly for all of
10 the 14 implementing plants, we didn't have any
11 guidance.

12 And we felt that was a potential
13 vulnerability for the stations. So, we wrote the
14 guidance document, which subsequently became
15 Appendix E and NEI 12.06 Revision 2.

16 And we established some goals for that
17 validation team to develop the template. We needed
18 to provide guidance to augment NEI 12.06. We had
19 NRC expectations that were revealed in public
20 meetings when we were discussing NEI 12.06 with the
21 staff, that we needed to make sure we met.

22 We wanted a consistent process so we all
23 did the validation the same way. We wanted to prove
24 that the strategies, particularly the tasks, and we
25 identified a task as Time Sensitive Actions later on

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1 in subsequent slides.

2 They were feasible and executable. We
3 wanted to provide some qualitative assessment on
4 human factors and show that there was sufficient
5 margin in the strategies.

6 We wanted to ensure that there was
7 integrated review of the strategies. And we wanted
8 to separate validation from verification.

9 We initially had some confusion among us
10 as an industry. We commingled those two terms. And
11 they're separate and distinct. Go to the next
12 slide, Scott.

13 So, that was one of our challenges. And
14 I'll -- verification is the act of, does the pump
15 meet its pump head curve? I ordered eight reels of
16 hose 100 feet in length. What did I do to verify
17 they were 100 feet in length?

18 For validation is, can I implement the
19 strategies in the time lines in our overall
20 integrated plan as intended. So, we -- and as part
21 of the validation process, we went through the
22 overall integrated plans.

23 Identified those tasks and manual
24 actions that required validation. We developed a
25 screening criteria or a selection criteria. And

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1 I'll get to that in a few slides.

2 Conduct the validation and document the
3 results. So, another part of the validation
4 template and the guidance was that we all document
5 the validation consistently among the utilities.
6 Next slide.

7 We didn't want to confuse the actions in
8 the FLEX support guidelines from EOP, Emergency
9 Operating Procedure actions. So, we created a new
10 term, Time Sensitive Actions.

11 And we wanted to distinguish that.
12 Because procedurally, time critical actions that are
13 actions in our PRAs and in our EOPs, have a certain
14 level of the requirements on them.

15 And we want to distinguish that. And we
16 also didn't want to bend them all together. Which
17 would add an additional burden to the plants.

18 So, we went through the overall
19 integrated plans and our sequence of events time
20 lines. And we selected those TSAs that needed to be
21 validated.

22 And this is a typical table. It happens
23 to represent the Palo Verde overall integrated plan
24 and Time Sensitive Action. But, as you can see,
25 diagnosis of the -- and an ELAP would be an operator

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1 Time Sensitive Action.

2 The DC load shed strategy would be a
3 Time Sensitive Action at most plants. And manually
4 operating the atmospheric dump valves or the
5 turbine-driven aux feedwater pump are typical Time
6 Sensitive Actions. Next slide.

7 We picked a graded approach. And there
8 was some synergies between the Alpha, Bravo, and
9 Charlie selection that we chose that relate to NEI
10 12.01 and the staffing studies.

11 If you recall, the staffing studies,
12 zero to six hours, you don't assume any help from
13 offsite. After six hours but up to 24 hours, you
14 assume limited access.

15 And a limited amount of people make it
16 to the site. And then after 24 hours, you have
17 nearly normal access to the plant.

18 So we broke the Time Sensitive Actions,
19 or we created the Time Sensitive Actions so there
20 were some synergies with the staffing studies to
21 make it consistent.

22 So, Level Alpha Time Sensitive Actions
23 are those within the first six hours. Level Bravo
24 within six to 24. And then Level Charlie are
25 essentially 24 and beyond.

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1 Or Level Charlie also those that are
2 labor intensive or require significant coordination
3 where we would require offsite resources to assist.

4 CHAIR STETKAR: Mike?

5 MR. POWELL: Yes, sir?

6 CHAIR STETKAR: Before we leave this,
7 that six hour split between Alpha and Bravo, if I go
8 back and I read the fundamental guidance for kind of
9 those times, which is in a report that I'm trying to
10 find in my notes here, NEI 12.01.

11 In that document it says additional
12 staff and resources will be available onsite
13 commencing at the six hour point. But, if I read
14 more details in there, it says individuals may
15 access the site by walking, personal vehicle, or via
16 alternate transportation capabilities, e.g. private
17 resources provided by the public sector.

18 If -- further on in that guidance it
19 says well, we won't have the full complement of
20 people there at six hours. And yet when I read your
21 guidance, it seems to assume that I have everybody
22 that I need there starting at six hours.

23 No matter who I need, they're there.

24 MR. POWELL: That's not the intent.

25 CHAIR STETKAR: Okay.

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1 MR. POWELL: The intent is that the
2 validation line up and validate the assumptions in
3 the staffing studies. So, if a plant said between
4 six and -- or after six hours I get two van full of
5 people.

6 And here's the -- I have three
7 mechanical craft, two auxiliary operators, whatever
8 those assumptions are, that those people are
9 available in the six to 24 hour time frame.

10 CHAIR STETKAR: I'm of course reading it
11 to try to look for holes. I didn't get that
12 impression reading it.

13 Because everything that I saw said well,
14 after six hours -- I don't think it says anywhere
15 explicitly you can assume that you have everybody
16 that you'd ever need. But I didn't get the sense of
17 the caveat saying you need to look very clearly and
18 carefully about this evaluation.

19 Especially because this same guidance
20 for validation, we'll get into that a little later,
21 is going to be used now when people are starting to
22 do these very focused event specific, strategy
23 specific assessments. To say yes, my strategy for
24 this particular event with a flood warning time of,
25 you know, 87 minutes and 38 seconds, will have

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1 enough people available at six hours to move things
2 around.

3 And you may want to go back and re-look
4 at those caveats to make sure that people recognize
5 them.

6 MR. POWELL: Jim Riley's bringing down
7 an action to do that. But, the validations were
8 done consistent with established study with a
9 minimum staff complement available.

10 I'm not aware of anybody myself --

11 CHAIR STETKAR: For Level A.

12 MR. POWELL: For Level A. Yes.

13 CHAIR STETKAR: No, I'm talking about
14 the Level B stuff.

15 MR. POWELL: Level B. Yes.

16 CHAIR STETKAR: What kicks in to get me
17 from an A to B. Because the level of scrutiny,
18 let's call it that, diminishes from A to B.

19 MR. POWELL: I'm not aware of any plant
20 that assumed the full complement of people before
21 the 24 hour mark.

22 CHAIR STETKAR: Okay.

23 MR. POWELL: All right? There are some
24 assumptions in the each individual plant staffing
25 study that says between six and eight hours.

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1 I believe there's a two hour briefing to
2 get you up to speed within that staffing study.
3 They assume some small complement of people make it
4 to the staff.

5 And that's justified in each individual
6 plant's staffing study. And then after 24 hours
7 it's nearly normal access.

8 CHAIR STETKAR: Yes. And that's clear.
9 I mean, that's clear. I have to point out --

10 MR. POWELL: But I --

11 CHAIR STETKAR: I'm just worried about
12 these -- as we get more and more specific on these
13 assessments, some of these assumptions in
14 intermediate times. Although six hours may sound
15 like a long time, maybe not so much if I have to get
16 bulldozers out and clear the roads.

17 They become much more sensitive in terms
18 of what people are actually assuming.

19 MR. POWELL: I understand. And I can
20 tell you in the case of Palo Verde, I think we
21 assumed that we would get two van full of people
22 within the six to 24 hours.

23 CHAIR STETKAR: That's -- but the
24 problem is, we don't see all of them. Nor do we
25 want on the record to see all of the individual

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1 evaluations.

2 MR. POWELL: Right.

3 CHAIR STETKAR: All we have to go by is
4 what we can read in your documentation and any
5 staff, you know, responses in their Draft Regulatory
6 Guidance.

7 And as I mentioned previously, part of
8 our role is to look for gaps. Or look for what
9 might be done because other people might interpret
10 it differently then, you know, then you're
11 particular evaluation of Palo Verde or someone
12 else's plant specific one.

13 MR. POWELL: What I do know is each
14 plant's got a separate review of the staffing study
15 by the Nuclear Regulatory Commission. And any of
16 those anomalies, I would imagine would have been
17 pointed out.

18 CHAIR STETKAR: All right.

19 MR. POWELL: Or any exceptions that
20 seemed out of place would have been challenged.
21 But, maybe we can check with the staff on that.

22 CHAIR STETKAR: But they hadn't -- but
23 the staff hasn't necessarily thought about -- I
24 mean, you can think about a staffing study in the
25 broad sense of, does it seem to make sense.

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1 MR. POWELL: Sure.

2 CHAIR STETKAR: As it becomes more and
3 more focused now, as people are doing these more
4 targeted assessments if you will, you might lose
5 track of the fact that some of the broader
6 principals in that staffing study may not apply for
7 what assumptions you're making in a more focused
8 assessment.

9 That's the big concern for me.

10 DR. SCHULTZ: Jim, can we --

11 MR. POWELL: Okay.

12 CHAIR STETKAR: And I don't want to say
13 big concern. That's the reason I raised the
14 question.

15 MR. POWELL: No, no. Good question.
16 We'll take it as an industry action. And Jim's got
17 it written down. And we'll follow up with you later
18 on.

19 DR. SCHULTZ: Mike, let me ask. It
20 really looks like clarity and communication here,
21 Mike. Because your major bullet could well be
22 interpreted that what we're focusing on is between
23 zero and six hours.

24 And making sure that everything is in
25 place appropriately in that area. But, you've

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1 indicated that six to 24 hours is as important in
2 terms of the required staffing that is assumed that
3 that needs to be validated as well.

4 MR. POWELL: And that's the --

5 DR. SCHULTZ: I think the way it's
6 written, it could be interpreted differently.

7 MR. POWELL: No. In fact, the Guidance
8 allows you also, or provides a provision that you
9 can actually take a Bravo or Charlie action and move
10 it up one level.

11 So, you can take a Charlie and make it a
12 Bravo.

13 DR. SCHULTZ: That would certainly be
14 fine to do.

15 MR. POWELL: Yes. Or --

16 DR. SCHULTZ: But again, it's just a
17 matter of how it was communicated, to demonstrate
18 that it's the -- those things that occur shortly
19 after the event is really the zero to 24 hour time
20 frame in terms of making sure the staffing is there
21 to perform the appropriate task.

22 MR. POWELL: And it also depends on the
23 level of engineering analysis that went into it.
24 For example, plants can get a lot of benefit out of
25 doing -- taking out the two sigma decay heat penalty

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1 in the cool down analysis by doing a best estimate
2 using origin and scale.

3 And they can actually extend their cool
4 down -- their times to respond and hook up portable
5 equipment. Or even the time to refill the
6 condensate storage tank by using best estimate
7 method.

8 So, that -- those are all factors that
9 would go into --

10 DR. SCHULTZ: Well, I would understand
11 that. And I have -- I guess I had a question that I
12 didn't ask. And that -- and you just kind of --
13 you've described it for me.

14 And that is, the first bullet that you
15 described that the assumptions associated with the
16 analysis can be from the equipment operability
17 viewpoint. Or there can be allowances to take into
18 account additional capability in the evaluation.

19 That provides a lot of latitude for
20 licensees to have a variety of results. And that's
21 good. That's good. But, if it's not -- the lack of
22 consistency can also cause some difficulty in making
23 sure that everyone understands the connection that
24 you've just described.

25 MR. POWELL: I understand.

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1 DR. SCHULTZ: Because it can happen that
2 people are making comparisons and validations to say
3 well, I'm as good as the -- I'm as good as they are
4 because I've got an evaluation analysis that
5 demonstrates it.

6 But, if the analysis are different, then
7 it can cause some potential confusion in the
8 validation process.

9 MR. POWELL: I would agree. It can
10 cause some.

11 DR. SCHULTZ: So, knitting those things
12 together carefully is important.

13 MR. POWELL: Yes, sir?

14 MR. BAUER: Can I make one
15 clarification? Oh, I'm sorry. Go ahead.

16 MEMBER SKILLMAN: I'm in Rev. 2 of your
17 006. I'm at paragraph (e)(6)(1). Echo, six, one.

18 And in this paragraph you identify
19 reactive TSAs within the first 24 hours included in
20 the validation process and anticipatory TSAs
21 included in the validation process. It seems to me
22 that what is reactive and what is anticipatory would
23 vary from site to site and maybe from leadership
24 team to leadership team.

25 How do you make the distinction between

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1 those two? What is reactive and what is
2 anticipatory?

3 MR. POWELL: That's a good question.

4 MEMBER SKILLMAN: Does it even matter?

5 MR. POWELL: Well, in some cases it may
6 not matter. A reactive one would be the need to
7 like, diagnose the ELAP within say an hour. And
8 then start your DC load shed.

9 I would say that would be reactive. I
10 would say if I'm diagnosing the event and I have to
11 start my DC load shed in parallel before I diagnose
12 the event, that would be reactive.

13 On the other hand, if I'm looking at a
14 flood and taking credit for warning time that might
15 be -- fall into the other category.

16 So, I know I've got upstream dam
17 failure. I know I've got 96 hours before it hits
18 the site. What are the actions I do from a time-
19 based standpoint to prepare for the event to hit the
20 site?

21 And I hate talking about a flood.
22 Because I -- that seems to be a sensitive issue this
23 morning.

24 But, to me that would fall into the
25 other category. The reactive ones would be ones

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1 where I have to take an action very early on in my
2 overall integrated plan to achieve success of my
3 strategies.

4 A reactive one might also be one with
5 very little or no margin.

6 MEMBER SKILLMAN: Would reactive --
7 excuse me, would anticipatory include considerations
8 for offsite?

9 MR. POWELL: That's a good question. I
10 don't know the answer to that.

11 MR. BAUER: When we originally did
12 Appendix E or the white paper, we did really not
13 have a provision in it for anticipatory actions. It
14 was all, you know, eve -- at time zero my ELAP
15 occurs. Now I have to go implement all my FLEX
16 steps. What do I validate?

17 And as we modified it to incorporate
18 Appendix G, which is the flooding evaluation hazard,
19 we said okay. There are going to be actions I'm
20 going to need to take in advance of the flood in
21 order to -- so, one of the options was I'm going to
22 be able to still make FLEX work.

23 So we said well, in order to make FLEX
24 work, I may have to move flood diversion equipment
25 into place or something like that. So, we said,

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1 we've got to have a provision in here for those
2 actions that I'm going to take as I know this wall
3 of water is coming down the river that I'm going to
4 put into place that will set me up so then my FLEX
5 strategies will work.

6 MEMBER SKILLMAN: I'm just kind of
7 reflecting on a couple of things that maybe John's
8 question and Harold's question too. What do you do
9 if you're on a plant site that depends on bridges
10 and you have a flood?

11 So, the earthquake takes out your
12 bridges. Here comes this wall of water. And I will
13 tell you from firsthand experience, one of the first
14 things you're doing is trying to figure out how many
15 choppers you need to bring in your relief crews.
16 Because there's no other way for them to get onsite.

17 So there's the FLEX issue, but there's
18 this whole people issue. And you need those
19 individuals.

20 So, it seems to me that this
21 anticipatory might have some rather high prominence
22 almost as a reactor. So, thank you.

23 MR. BAUER: No, thank you. Good
24 question.

25 CHAIR STETKAR: Mike, I'm going to

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1 intercept you here a moment. We have way too much
2 stuff to cover this morning.

3 What I'm going to suggest is, I know you
4 have an example from Palo Verde. I don't think
5 we're going to go through that.

6 MR. POWELL: That's fine. Okay.

7 CHAIR STETKAR: Okay. But, I do have a
8 couple of other questions.

9 MR. POWELL: Sure.

10 CHAIR STETKAR: Kind of at a higher
11 level. So, maybe we can try to intercept that
12 there. Because I need to leave enough time for
13 Appendix G and H, which are also equally important,
14 if not more so, or less so.

15 Anyway, on the basic validation process,
16 one of the concerns that I had when I read through
17 the Guidance, is that you get -- you could get into
18 a situation where you have what I've jotted down in
19 my notes here, is kind of a segmented validation.

20 I need -- to drink this coffee, I need
21 to move my left hand out and grasp the cup. So, I
22 do an analysis on that action.

23 Now I need to pick the cup up. Now I
24 need to bring it to -- and maybe I just -- I missed
25 the fact that he was talking to me and I forgot to

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1 do it at all.

2 In other words, where do I get the
3 integration of all of these individual piece part
4 validations? The individual task validations such
5 that I have confidence that the entire strategy if
6 you will, can be implemented with adequate margin.

7 Because if I read the things, they are
8 very focused on individual tasks. You know, get out
9 the bulldozer and move it. Or, you know, move the
10 pump up the hill or whatever.

11 MR. POWELL: The segmentation approach,
12 I'll use an example. Is, if I have to route a
13 thousand feet of cable, but six hundred is up six
14 flights of stairs, I might time put the six flights
15 of stairs and say the rest of it is -- the remaining
16 four hundred feet is on level ground. And I may do
17 that separately and then add the two together.

18 That's the intent behind the segmented
19 approach. Now -- oh, go ahead.

20 CHAIR STETKAR: Okay, I get -- that's
21 part of it. But, what I'm talking about is that in
22 order to accomplish my overall function, that's --
23 getting the cable run from point A to point B, which
24 might involve steps and might involve level ground,
25 is one part of that strategy.

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1 Another part of the strategy might be
2 hauling a pump from point A to point B such that it
3 can be connected to the buss you just ran the cable
4 to. Another part might be actually getting the
5 connection from said pump hooked up to some, you
6 know, pipe in the plant.

7 All of this though has to be done in the
8 context of a response plan. An integrated response.
9 That maybe a bad word for today, but an entire end
10 to end response.

11 And how do you -- and that end to end
12 response can be affected by things that you might
13 miss during your evaluation of running up stairs or
14 moving a pump. Hence my question of, if he
15 distracts me, I might not ever get to the point that
16 I reach out my arm to grab the coffee cup, and hence
17 never drank my coffee.

18 MR. POWELL: I believe as a general
19 rule, plants when they did the validation, they
20 would deploy the pump and the support equipment at
21 the same time. So, they wouldn't deploy the pump
22 and then come back on day two and deploy the hose.

23 They would do the validation and --
24 because part of the issue here is we need to know
25 the amount of margin.

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1 CHAIR STETKAR: Yes. Well, but that's -
2 - see that's my whole point. That if I do a piece
3 parts evaluation and I say well, I've got, you know,
4 18 minute margin for this. And I've got seven
5 minutes margin for this other thing. And therefore
6 because I add them together, I now have 25 minutes
7 margin total.

8 Well, maybe I only have seven minutes
9 margin because something else gave me problems with
10 my 18 minute thing. So, follow me?

11 MR. POWELL: Yes.

12 CHAIR STETKAR: So, that's my concern.
13 Who's looking at the kind of end to end -- and I
14 don't care whether it's anticipatory you know, or
15 reactive, or however you want to characterize it.

16 MR. POWELL: I believe the plants have
17 done a good job looking at that. Particularly if
18 you take a multi-unit station. And I'll take Palo
19 Verde.

20 CHAIR STETKAR: Yes.

21 MR. POWELL: We had a challenge with
22 doing validation on all three units. So, we picked
23 unit two to validate.

24 And then we scaled the time down for
25 unit one, because that's the closest to the FLEX

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1 storage building. And we scaled time up for unit
2 three, because that's the furthest away from the
3 FLEX storage building.

4 But, we did all our validations on unit
5 two. And when we validated unit two, we deployed
6 the equipment, the hose, the support equipment, the
7 pumps, the generators, and ensured we had adequate
8 time.

9 I believe most if not all other plants
10 did something very similar to that relative. But,
11 the scaling, we did scale down and up relative to
12 time.

13 What a lot of plants also did, and there
14 was some center -- they created a schedule. Because
15 if you say I have to deploy a pump say at 34 hours,
16 in the case of Palo Verde, that's deployment of
17 three pumps.

18 So, when do I have to start? I have to
19 start probably at hour 26 to get all the pumps and
20 the support equipment.

21 So, what a lot of plants did, they laid
22 out a schedule in a scheduling tool called P6, and
23 looked at the deployment with the resources they
24 had. And could we move the equipment in the time
25 frames needed.

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1 So, that would also show that I have
2 sufficient margin and were my strategies feasible.
3 Here's a -- we actually created deployment packages.
4 We treated it as work.

5 I'm moving a piece of equipment from
6 location Alpha to location Bravo. And so we laid it
7 out in a sequence. And when we built the schedule,
8 we actually know what time we have to start
9 deploying these vehicles.

10 MR. BAUER: I think the answer to Dr.
11 Schultz' question earlier, on the one side we had
12 said that the six hour point and the actions in that
13 were given more attention. Really, the actions that
14 were given more attention were the ones that had low
15 margin.

16 So, if after I did the validation, I
17 said okay, I have to have this function in place and
18 operating within six hours. If it took me three
19 hours, I said I have plenty of margin. So, that
20 would account for some of the variability that
21 you're talking about.

22 But, if I found out for example in
23 stripping loads or doing load shed my margin was
24 five minutes from when I needed to really strip load
25 to make sure my batteries, then I would do that

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1 repeatedly with different -- for example, that
2 became a -- in some plants it became a performance
3 measure for auxiliary operators, for all of them to
4 do as an in plant JPM for example.

5 So that we could then consistently show
6 that all operators could do this action in the time
7 required to. So, really margin was the driver for
8 how much additional work I put into the validation.

9 So, I knew I, you know, for example,
10 Mike has an action to deploy a pump to refill the
11 condensation storage tank in 32 hours. Well, I can
12 do it in six. So there's plenty of margin there.

13 That type of an action wouldn't get a
14 lot of, you know, additional validation attention.

15 MEMBER BLEY: You know, just something
16 I've been stewing on. And part of what Scott just
17 walked through helps me some. But not completely.

18 Back in the early '80s we developed a
19 new kind of emergency operating procedures we have
20 in the plants. Over the next probably ten years as
21 grid operators on simulators worked through those
22 over and over again, we found more and more glitches
23 and fixed them.

24 Dead ends, funny things in the
25 procedures. And by now they're very good. We

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1 probably learned a lot from that. And then we
2 started doing procedures for accidents during shut
3 down.

4 And we thought we wrote good procedures.
5 And I only went to one plant and we played with
6 this. And when we actually started using them with
7 more than one person walking through, the same thing
8 happened.

9 So, exercising them over and over by
10 more operators found more glitches and fixed them.
11 And I'm not trying to suggest we want to overtrain
12 on this stuff.

13 But, if we've only done the validation
14 on one unit out of three or out of two, are we at
15 least walking through with the other operators? I
16 like that all the auxiliary operators at least one
17 plant went through this process.

18 What do we do over the next few years to
19 make sure funny things that happen during the
20 installation of this stuff, we uncover? So that
21 when we really need it, it's like we think it is.

22 MR. BAUER: That's a good question. I
23 can tell you that on the case of Palo Verde
24 specifically, we got very good feedback when we did
25 the initial training.

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1 We ran the simulator for the first four
2 hours. So, that got us through the cool down to
3 operation of the turbine-driven aux feedwater pump.

4 We had completed our DC load shed. And
5 obviously declared the ELAP. And we were on our
6 atmospheric dump valve and our turbine-drive aux
7 feedwater pump.

8 We got good feedback from all 15 crews
9 and the admin crews to the procedure. But, we also
10 identified that the procedures, because the owners
11 group gave us a very good template, the pressurized
12 water reactor owners group gave us such a very good
13 template, there were no fatal flaws.

14 I can tell you in the case of Palo Verde
15 that we're on Rev. 2 of our FSGs. We continue to
16 get feedback from the operators and from the
17 auxiliary operators.

18 And we've even added some defense in
19 depth actions. I would believe that that's typical
20 of what's going on at a lot of our sites here in the
21 U.S.

22 Our auxiliary operators just completed
23 another round -- they completed training on the --
24 all the equipment. Now, our fire department has the
25 lead at Palo Verde, and they're trained on the

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1 equipment.

2 But we just trained all our auxiliary
3 operators. And we got more comments on what I call
4 the hard cards, or the operating aids that are
5 attached to the equipment.

6 We also identified the hard cards and
7 the template that was developed by the industry was
8 very good. We got enhancements to the cards.
9 Again, no fatal flaws with the cards.

10 And I believe similar feedback is going
11 on at other sites.

12 MEMBER BLEY: That helps. And I hope it
13 is. There's a related thing that I've asked you
14 guys before. And I've asked the staff at times as
15 this has evolved.

16 Let's say for ELAP, if that were a
17 design basis accident, we could hard-wire stuff into
18 the plant and do it perfectly. You know, really
19 well. Really well.

20 But the idea of FLEX, at least what I
21 hope the idea of FLEX is, and I worry at times that
22 it's slipping away from that. Is that when that
23 event we've designed for isn't the one that happens,
24 but it's something a little different that we're
25 still flexible.

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1 Now, the exercise, any I organized for
2 us to walk through on the boiler, helped a lot with
3 that. But, even things we're saying, if -- I like
4 that we're exercising and we're finding problems.

5 If we're overspecializing these
6 procedures to the stylized event, I worry we might
7 have some trouble when the real event happens.
8 Which isn't the stylized one.

9 MR. BAUER: Well, I believe there's an
10 industry initiative that's also going to have a
11 culture change at the plant. And that's the use of
12 FLEX equipment for risk informed decision making.

13 In some plants, including Palo Verde,
14 have started pre-deploying equipment for outages to
15 reduce shutdown risk. And add defense in depth on
16 outages.

17 But what does that do? That gives us
18 proficiency in deployment of the equipment. Setting
19 up. Reattaching the anchors, the seismic tie-downs.
20 And that's a repetitive action which is a positive.

21 The other thing I think that it will
22 evolve with time is, culturally the operators, the
23 on crew shift is going to think, I got this plant
24 situation. Can my FLEX equipment help me?

25 And I think that will be a good thing in

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1 the long term.

2 MEMBER BLEY: Okay. I like that. And
3 the exercise you guys did for us, really helped.
4 But, there is a little push and pull about
5 flexibility versus doing the best you can for a
6 stylized thing.

7 And I hope we end up with middle ground.

8 DR. SCHULTZ: Mike, tell us about moving
9 through the industry. You mentioned what Palo Verde
10 is doing and saying you think it's happening at the
11 other units.

12 But, is it the owners groups? Or MPO?
13 Or NEI? Who's --

14 MR. BAUER: NEI is driving it right now.
15 Mike Tschlitz and Tom Zachariah are leading it.
16 There's a very strong industry team put together.

17 They're writing some standardized
18 guidance for the plants to use. The industry and
19 NEI has had a series of meetings with the NRC staff.
20 We're gaining momentum with the staff in acceptance.

21 We're still working in that direction.
22 We're creating a generic industry guideline
23 document.

24 DR. SCHULTZ: Good. Thank you.

25 CHAIR STETKAR: Mike, I have one more on

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1 Appendix E. And it kind of relates to stuff we're
2 going to be talking about later and also this
3 afternoon.

4 I like the way it's laid out by the way.
5 It follows a lot of the guidance in terms of laying
6 out time lines and looking at margins and things
7 like that. It's really good. Provided it's
8 implemented according to the intent.

9 No where do you address the issues of
10 uncertainties in those times. And I know that
11 margin is used in some sense as a surrogate for
12 uncertainties.

13 What I'm concerned about is that when we
14 start addressing now more focused evaluations, and
15 we'll talk a little bit about that this morning,
16 more this afternoon. Because that's more of a topic
17 this afternoon, but I wanted to bring it up.

18 Those focused evaluations, the Guidance
19 for those focused evaluations invariably point to
20 Appendices B, C and E in NEI 12.06. And B has
21 information in it -- I think it's B. I get lost
22 occasionally. It doesn't make any difference.

23 One of them has guidance in it in terms
24 of looking at the reliability of equipment. It
25 says, you know, you need to look at data. You need

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1 to look at unavailability and that kind of stuff.

2 The bigger picture in the focus
3 assessments are you progressively go, I think, from
4 demonstration that you don't have a problem to
5 demonstration that you may have a problem, but I can
6 show with confidence that my strategy is both
7 feasible and reliable.

8 To demonstration that there may be
9 conditions that are rare events. And all I have to
10 do for those is to develop assurance that the
11 responses are feasible rather than reliable.

12 So, we go from no problem, feasible and
13 reliable, feasible. The Guidance always points to
14 Appendix E in terms of evaluating human performance.
15 Appendix E, as you mentioned, is carefully crafted
16 to say we're only looking at feasibility.

17 When I start talking about reliability,
18 how Appendix E will be used for those assessments
19 that should demonstrate both feasibility and
20 reliability, how is Appendix E responsive to that
21 reliability aspect?

22 And in particular, I'll point you and
23 I'll point the staff more when we talk about this,
24 there are -- there is guidance out there that has
25 been used to take the concepts in Appendix E and

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1 translate them into some course estimates of
2 reliability based on the available time margin.

3 And it's guidance that's been developed
4 in conjunction with the industry. It's in NUREG
5 18.52 starts that process. And NUREG in particular,
6 NUREG 19.21. Which was developed in particular for
7 fire events.

8 But, it's a construct. Has that type of
9 guidance. So that in principal, you could use,
10 including estimates of uncertainty, the same
11 construct to also develop a concept of reliability.

12 And why have you not instituted that?

13 MR. POWELL: Well John, can you save
14 that question for later?

15 (Laughter.)

16 CHAIR STETKAR: Oh no. I was going to
17 bring it up this afternoon. But the problem is, it
18 points back -- it always points back to Appendix E.

19 MR. BAUER: So we did include, to some
20 extent in attachments 4 and 4 of Appendix E,
21 elements to address human reliability.

22 CHAIR STETKAR: You did. But, when you
23 rewrote Appendix E you took out most of the text.
24 The original version, the last I will say. The last
25 version that I read talked about both feasibility

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1 and reliability. And pointed to those attachments.

2 MR. BAUER: Right.

3 CHAIR STETKAR: The current version, not
4 so much. Those attachments are there. But, it --
5 the current version the way it's constructed, in
6 fact I think it explicitly says, we're only looking
7 at feasibility now.

8 That it's not the intent of Appendix E
9 to demonstrate reliability of the actions. Is that
10 right, Mike, B?

11 MR. POWELL: Qualitatively we did some -
12 - the industry took some actions to make a
13 qualitative assessment of reliability. For example,
14 we implemented standard maintenance templates for
15 all the FLEX equipment to ensure some level of
16 quantitative reliability.

17 CHAIR STETKAR: That's hardware. I'm
18 talking about people.

19 MR. POWELL: Well, people it's a
20 qualitative assessment is also. And what I mean by
21 that is, when you make a connection, you hook up a
22 stores connection, a pipe to a store setting,
23 there's an audible click.

24 So, that sends a signal to the auxiliary
25 operator or the fire department or the security

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1 officer, who's ever responsible at that particular
2 site to deploy the FLEX equipment. That I've made
3 the connection.

4 When you do your DC load shed, an
5 auxiliary operator is trained that there's
6 resistance in the switch. And when you flick the
7 switch from closed to open, there's also a noise but
8 a resistance. And can I hear that? Am I sensitive,
9 is that sensitive to touch?

10 That feeds into a qualitative assessment
11 one that the strategies are feasible. But we don't
12 try and qualify or come up with an uncertainty
13 number of that makes any sense.

14 CHAIR STETKAR: And I was -- okay. I'll
15 just leave it. We're going to run short on time.

16 I wanted to get some feedback from you
17 while I had you up. Because you drew the short
18 straw on Appendix E.

19 (Laughter.)

20 CHAIR STETKAR: We'll talk more about it
21 this afternoon when we talk about the specific
22 flooding assessments. Where you do have this
23 hierarchical approach too feasible and reliable
24 versus only feasible.

25 I'm going to try to keep us somewhat on

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1 schedule. This is important. It's important to get
2 through the NEI Guidance. So we might run a little
3 long on this section.

4 But, anybody have any questions on
5 Appendix E? Because we're going to shift gears now
6 and go to Appendix G.

7 If not, Jim, you're up.

8 MR. RILEY: All right. Thank you. This
9 is Jim Riley. I'm with NEI. And I'd like to talk
10 to you about Appendix G.

11 Appendix G is the process that we
12 developed for evaluating the effects of the
13 reevaluated flood on mitigating strategies. You may
14 remember that we brief you on Appendix G a year ago.
15 And so this is an update to the information that was
16 presented then.

17 You're probably aware that there's five
18 paths that we've defined for how a flood might
19 affect mitigating strategies. One of those is a
20 situation where the flood is less than the FLEX
21 design basis.

22 The next one is FLEX is okay. In other
23 words, it's greater than the FLEX design basis. But
24 FLEX can still be implemented as designed.

25 The third is modifying FLEX. All of

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1 those course ends up with a situation where FLEX and
2 all of its capabilities are still intact.

3 The other two are an alternate
4 mitigating strategy and a targeted hazard mitigating
5 strategy. And if you remember from briefing from a
6 year ago, the targeted hazard was to address the
7 situation where containment capability was not
8 provided.

9 That's the general lay of the land.
10 MSAs just in terms of understanding a schedule here,
11 they're due by December 31 at the end of this year.

12 Except for those sites who have not
13 received letters from the NRC that approve their
14 flooding reevaluation results by the end of last
15 year. And then for those sites, it's one year after
16 the time they receive that.

17 CHAIR STETKAR: Jim, maybe you can help
18 me. I was going to ask the staff, but you brought
19 it. In terms of -- as I read, especially -- well,
20 as I read things, it almost sounds like the MSAs are
21 done, reviewed by the staff, and in some sense --
22 well, I'll just say that.

23 Done and reviewed by the staff. And
24 then the more detailed, whether I call it a focus
25 assessment, but as I go down through the different

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1 options, whether it's Appendix G or Appendix H.

2 Those are done in some sense after the
3 MSAs are submitted and accepted? I mean, I think of
4 all of these things as the same process.

5 We're trying to do an evaluation on a
6 site specific basis, whether or not my strategies
7 will work for flooding and seismic in particular.

8 But, in general the schedule was all
9 laid out to allow that kind of an approach. To do
10 the MSAs, get the MSAs done, then move into the
11 focused assessments, and new integrated assessments.

12 You know, to a large extent there's the
13 same kind -- the same folks that are doing those.

14 MR. RILEY: Yes.

15 CHAIR STETKAR: So, there's a
16 realization that, do one thing at a time. But, I
17 think there's also, and the afternoon session can
18 talk more to this, the recognition that the -- the
19 work that you do on an MSA is certainly relevant to
20 what you would do for a focus.

21 MR. RILEY: That's right. And let's
22 postpone it for this afternoon. Because I had more
23 of my questions there.

24 Just because of the words are written, I
25 got a bit concerned about something getting cast in

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1 stone. And then people saying well, I either have
2 to ignore it, or I have to accept it, or something
3 like that.

4 Let's talk more about it this afternoon.
5 We'll also have a little more time.

6 CHAIR STETKAR: Okay. Go ahead.

7 MR. RILEY: One more point on this first
8 slide. In order to facilitate this whole process,
9 we developed a submittal template for what an MSA
10 ought to look like. And a number of examples that
11 address each of the cases above.

12 And those have been distributed to the
13 industry. They've been reviewed with the staff.
14 And that is already done work that's out there for
15 folks to use.

16 This slide you saw last year. It lays
17 out the process of how you do an MSA. I don't want
18 to go through each of these blocks.

19 But, just to kind of bring you back to
20 where we were a year ago, the intent here is not
21 necessarily to move through these blocks left to
22 right in all cases. Because when you develop your
23 options, you don't need to do that.

24 But this slide does a good job of
25 explaining what the different options are. And in

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1 general what the process is.

2 The next couple of slides, what I'd like
3 to describe to you is the process more from a
4 logical point of view. How would you actually go
5 about performing one of these mitigating strategies
6 assessments.

7 So, this figure is in the document. And
8 is a general guide on how this whole process
9 proceeds.

10 CHAIR STETKAR: So, Jim, let me just --
11 before we get into kind of walking through the
12 process. At the front end, and I don't know whether
13 this was there before or not. Because I reread
14 stuff and find things.

15 In Section G-3 where you talk about the
16 basis, you know, the upfront basis for the strategy
17 assessment, there's something that caught my eye.
18 And I'd like to understand this better.

19 It says, if the period of inundation for
20 the MSFHI flood event is greater than the period of
21 inundation of the event in the FLEX DB, design
22 basis, for a given flood mechanism, the FLEX design
23 basis does not bound an assessment of the associated
24 flood mechanism is required.

25 And there's a word missing there. That

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1 just says that if -- you have to have reevaluated
2 it, the duration of the reevaluated flood is longer
3 than the duration that I assumed in my nominal FLEX
4 design basis, I have a problem. And I need to --
5 then I need to look at that.

6 MR. RILEY: That's correct. Yes.

7 CHAIR STETKAR: But, it continues. It
8 says, note that the design basis flooding evaluation
9 for some licensees does not contain specific
10 information on the period of inundation.

11 In these cases it's not necessary to
12 conclude that the FLEX design basis does not bound
13 the MSFHI for the associated mechanism as long as
14 there is no reason to believe that the period of
15 inundation is increased.

16 Well, if I never knew what the period
17 was, how do I know that it's okay now?

18 MR. RILEY: That particular phrase was
19 as a result of a frequently asked question
20 discussion we had with the staff when we were
21 developing the Guidance a while back.

22 And it was to address a condition that a
23 lot of sites in their design basis don't say
24 anything about flood event duration. There's
25 nothing there.

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1 CHAIR STETKAR: All right, so they have
2 a problem.

3 MR. RILEY: Pardon me?

4 CHAIR STETKAR: All right, so in my view
5 they have a problem.

6 MR. RILEY: Well, you could look at it
7 that way.

8 CHAIR STETKAR: Because I don't know
9 what it is.

10 MR. RILEY: The other way you could look
11 at it is to say that -- and that was the intent of
12 the phrase that we wrote.

13 If you have no reason to believe that
14 the duration is change, in other words the flooding
15 event that you're describing is essentially the same
16 as the flooding event that's in the design basis,
17 then it's a legitimate assumption to make that the
18 duration hasn't increased by an amount that's, you
19 know, of particular concern.

20 And you can go ahead and make that
21 assumption. But, it was specifically to address the
22 fact that a lot of the flooding design basis don't
23 say, they're silent on the issue of flood event
24 duration.

25 CHAIR STETKAR: Yes, okay.

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1 MR. RILEY: And there was a decision
2 made not to make that a trigger to do that.

3 CHAIR STETKAR: Well, wait a minute.
4 Again, I think it's our role here to look for
5 perhaps gaps.

6 If I don't know what my plant is
7 designed for in terms of flooding duration, I don't
8 know that. It might be two seconds, it might be 200
9 days. I don't know that.

10 And now I have better tools. Or I'm now
11 formally asked to characterize the various sources
12 of flooding for my site. And characterize them both
13 in terms of timing, in terms of depth, in terms of
14 dynamic loading. And in terms of duration, how long
15 am I expected to be under water.

16 Okay. Well, that's good. If I didn't
17 know what my current design basis in terms of
18 duration was based on, wouldn't that trigger the
19 need to now do an assessment to understand whether
20 or not I can cope with what I now know is the
21 duration.

22 You know, to say I have no reason to
23 believe it was longer, well, I don't know how long
24 it was.

25 MR. RILEY: I think John, to answer your

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1 question, that you do need to consider how long the
2 flood of that duration is, and the purposes of
3 determining that your FLEX strategy is capable of
4 dealing with the reevaluated flood.

5 The distinction we were making at the
6 time we originally wrote that, had to do with the
7 trigger for whether an integrated assessment was
8 necessary. I'm taking you back now. This is a year
9 or so ago.

10 CHAIR STETKAR: Yes, I know. But, we're
11 -- now we've got the things in between what an
12 integrated assessment is.

13 And I'm trying to figure out where
14 people might conclude that I don't need to do any of
15 that because I'm okay. Because I thought I was okay
16 before.

17 So, if I'm doing a mitigating strategy
18 assessment now, I do need to look at the actual
19 flood duration that I am -- that I have calculated
20 in order to make sure that I can deal with that
21 flooding.

22 But only if I conclude that it exceeds
23 my current design basis. If I conclude that
24 everything is bounded within my current design
25 basis, I don't need to do a mitigating strategy

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1 assessment, right?

2 MR. RILEY: No. Everybody needs to do a
3 mitigating strategy assessment. The question is
4 whether or not -- the approach that you use. And
5 whether you classify yourself as a FLEX is okay, I
6 can deal with the hazard as et cetera, et cetera.

7 But, I understand what you're saying.
8 And --

9 CHAIR STETKAR: In other words, on your
10 picture here. If I look at the path that goes to
11 4.1 and down, you're saying that in some sense
12 that's a mitigating strategy assessment.

13 But it's not an assessment that looks at
14 either modifying FLEX or developing a more focused
15 approach or an integrated, you know assessment.
16 Anything to the right.

17 MR. RILEY: Maybe so.

18 CHAIR STETKAR: I can get a down on 4.1
19 if I conclude that everything that in my design
20 basis and whatever I've put in place for what's
21 called my nominal FLEX is okay.

22 MR. RILEY: Yes.

23 CHAIR STETKAR: Now, if I didn't have a
24 flooding inundation time as part of that design
25 basis, how do I make that conclusion now that I know

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1 what the inundation period is? Why am I not at
2 least forced over to a more detailed evaluation?

3 MR. RILEY: Well, in order to be able to
4 say that FLEX is okay, you'd have to be able to say
5 -- now, there's two distinctions here. The first
6 one is, can I say that my FLEX design basis bounds
7 the reevaluated hazard?

8 And I think that's more to the point
9 that you're asking, I believe.

10 CHAIR STETKAR: Right.

11 MR. RILEY: The second is the FLEX is
12 okay evaluation. It means you've taken a look at
13 the effects of the flood and determined you can
14 still live with it.

15 CHAIR STETKAR: Or even Jim, if I think
16 about it, even the down path on 3.0 that I don't
17 even need FLEX. Because I'm okay for floods.
18 That's probably more pertinent to my question.

19 MR. RILEY: Yes. I can -- all I can
20 tell you, it's a good question. I'll give you that.
21 The reasoning that I mentioned was what we came up
22 with before.

23 If there's nothing that's
24 demonstratively different between your reevaluated
25 hazard and your previous hazard, there's probably a

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1 good -- it's a good rationale to think that, you
2 know, that the duration is, you know, is accurate
3 within the kinds of accuracy which you achieve for a
4 flooding evaluation. And equivalent to it.

5 But, I'll grant you the question.

6 CHAIR STETKAR: Okay.

7 MEMBER RAY: Well, it seems like a
8 simpler way to say it is, if the duration wasn't
9 specified in the licensing basis, this isn't going
10 to cause you to derive a duration.

11 MR. RILEY: Well, the duration is
12 derived as part of your flooding reevaluation. So,
13 it will have a duration.

14 CHAIR STETKAR: The flooding
15 reevaluation requires a duration.

16 MR. RILEY: Yes. It does.

17 MEMBER RAY: But, you were doing a path
18 here in which you didn't have to determine a
19 duration.

20 CHAIR STETKAR: No. The flooding
21 reevaluation requires a duration. The question is,
22 when I compare it -- if I had in my direct design
23 basis a duration of, let's say one hour. And I've
24 reevaluated the flood such that it's 47 minutes, I
25 pass.

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1 Because my design basis accounted for at
2 least a 47 minute flood. If my design basis is
3 silent on duration and I have -- now I know that the
4 duration is 60 minutes, an hour.

5 MEMBER RAY: Okay. I misstated what I
6 meant to say. You're saying what I --

7 CHAIR STETKAR: I'm saying that I would
8 think --

9 MEMBER RAY: You have to determine a
10 duration. But if you didn't have one in the
11 licensing basis, then you can't decide --

12 CHAIR STETKAR: Right.

13 MEMBER RAY: Whether it's longer.

14 CHAIR STETKAR: This says if there's no
15 reason to believe that it's longer, I'm probably
16 okay.

17 MEMBER RAY: Okay.

18 CHAIR STETKAR: But I don't know what
19 I'm comparing it to.

20 MEMBER RAY: Yes. Okay.

21 CHAIR STETKAR: Am I comparing it to 47
22 minutes or 59, or 127? I don't know.

23 MEMBER RAY: What I was, I guess, trying
24 to say, and I didn't say it accurately was, you're
25 not required to derive a duration in your original

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1 licensing basis if it wasn't done previously.

2 CHAIR STETKAR: That's true. Because
3 there's no way to do that.

4 MEMBER RAY: Right.

5 MR. RILEY: Okay. It's a good question.
6 You can understand it was based on an engineering
7 judgment basis as the way that we set that up.
8 Based on the similarity of the hazards.

9 CHAIR STETKAR: Okay.

10 MR. RILEY: All right. So, in general
11 the -- the general approach here is that we evaluate
12 the implementation and mitigating strategies under
13 the conditions of the reevaluated flood.

14 And that the guidance that we provide to
15 do that is within NEI 12.06. And it's Appendices.

16 So, what we've done a lot of since the
17 last time you looked at this a year or so ago, is
18 greatly improve the cross referencing of the 12.06
19 and it's process to how you do a mitigating
20 strategies assessment. So, that's a large part of
21 what the difference is since -- in the last year.

22 The way we have set this up is the
23 mitigating strategies submittal would be a summary
24 level document, primarily focused on what are the
25 changes since, if there are any, or if there aren't.

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1 Stating that fact, since the design basis for FLEX.

2 And what's the basis for those changes?
3 Why are they acceptable? Of course detailed
4 documentation would be available on the site.

5 So, that's the general approach. And
6 everybody needs to do some of the initial steps.
7 And those are the ones that I'd like to talk about
8 now.

9 And the first is to characterize the
10 flood that you're dealing with then. The
11 reevaluated hazard. As you already have remarked
12 on, we take a look at what the reevaluated flood
13 parameters are.

14 Which by the way, are pretty well
15 defined by the NRC's letter that approved the
16 flooding reevaluation results. It lays out what
17 those parameters are so that that's clear, and
18 there's no question.

19 That's compared to the FLEX design
20 basis. And if you have a situation where the
21 reevaluated flood parameters are less than the FLEX
22 design basis. You're out of what you would call a
23 detailed mitigating strategies assessment.

24 And there's two kind of sub-pieces to
25 this. The first case would be your reevaluated

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1 flood is less than your FLEX design basis. And your
2 FLEX design basis is the same as the plant design
3 basis.

4 That becomes pretty straightforward.
5 There's a little bit more detail required for the
6 situation where your FLEX design basis is greater
7 than your plant design basis flood. But the
8 reevaluated flood is still less than the FLEX design
9 basis.

10 That requires more documentation to show
11 how you came up with that determination in terms of
12 the actual parameters that you obtained in the
13 reevaluated flood and those that were used in the
14 design basis for FLEX.

15 But in both those cases, the close out
16 is pretty simple. It's a letter to the NRC
17 documenting that you found yourself in this
18 situation.

19 If the reevaluated flood is greater than
20 the FLEX design basis, that's when you get into a
21 more detailed, mitigating strategies assessment.
22 You're evaluating now the effects of the flood on
23 FLEX.

24 You're doing so for all the hazards that
25 are applicable, i.e., all those that are not

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1 bounded. And one of the things that you have to
2 keep in mind as you're doing this, is that whatever
3 you do to accommodate this reevaluated flood, you
4 need to ensure that the base line capabilities of
5 FLEX to deal with other events, is not being
6 compromised by what you're doing to address the
7 reevaluated flood.

8 So, how do you do this effect on the
9 original FLEX strategy? Well, it's an evaluation of
10 the flood mechanism using all the various aspects of
11 FLEX that are addressed in NEI 12.06.

12 And I'll list them here but won't go
13 over all of them. They were looking at deployment
14 pathways. You're looking at strategies for
15 deployment of equipment and manual actions and
16 connection points.

17 All those kinds of things to see what
18 the effect on FLEX might be of this reevaluated
19 flood. And one thing that I want to point out here,
20 as you're doing that, the -- when you did -- when
21 FLEX was originally designed, it was assumed that an
22 ELAP occurred.

23 When you're going through this
24 evaluation, when the ELAP occurred might become part
25 of the considerations that you need to be looking

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1 at. You need to make sure that you've identified
2 specifically when you're making that assumption.
3 And you have a basis for when you make it based on
4 how the food is actually developing.

5 So, the questions that you asked that
6 everybody asked that gets me the point of saying
7 that I haven't -- I don't bound the reevaluated
8 hazard, is whether FLEX is okay or not. If it is
9 okay, then you document that fact.

10 And you say that there's no changes to
11 FLEX features. And there's no changes to the
12 strategy. And when you're making that assumption,
13 it's a pretty stringent kind of a thing.

14 If you're affecting FLEX design and your
15 affecting FLEX connection points. If you're
16 affecting your strategy that you have to follow your
17 operator actions, then you get into a modified FLEX
18 or some other strategy.

19 Is FLEX okay basically means that the
20 way I first proposed it, it still works. Even with
21 the reevaluated flood.

22 If you determine that some changes are
23 necessary, now you're moving into the rest of the
24 procedure. And before you do that, or as you do
25 that, some of the things we're asking you to

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1 document are those aspects of the FLEX strategy that
2 couldn't be implemented as designed because of the
3 reevaluated flood.

4 WE are asking you to document for each
5 of the strategies which -- or excuse me, each of the
6 flood mechanisms, which strategy you are using to
7 accommodate that flood.

8 And then of course you'll evaluate the
9 strategy for each of the applicable mechanisms. And
10 this -- what does this strategy look like for all
11 the MSAs?

12 Well, once again, this is a little bit
13 repetitious. You use the reevaluated flood
14 parameters. We've already been talking about that.
15 You design -- address the design features and the
16 sequence of events.

17 You make sure that the things that you
18 say you can do, you're actually going to be able to
19 do. So, you lay it all out and make sure that
20 people can get to where they're supposed to be.

21 The actions can be taken, et cetera. If
22 you need to revise your time line, you need to set
23 up the revision of the time line based on the actual
24 flooding parameters.

25 12.06 gives us the guidance we need on

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1 how you lay all that out. A combination of 12.06,
2 the body of and Appendix E, which we just talked
3 about.

4 And then your documentation. You
5 document all of this. You retain it as a record
6 onsite. And then you make a submittal of what is
7 the basis for my strategy? What are the changes?
8 How did I -- why are they acceptable?

9 And as we'll talk about a little bit
10 later, as you're developing this strategy, one of
11 the things we ask for more justification on, is a
12 situation where you're using the THMS strategy as
13 opposed to anything -- or the other strategies that
14 maintain all the key safety functions.

15 And by the way, one of the questions
16 that's been asked in the past, is how many plants we
17 thought would be in THMS strategies. And we've done
18 some surveys recently to get a better feel for how
19 many.

20 And there are very few. There were one,
21 maybe two sites that would have to do that. And I
22 believe in some cases this was already -- the
23 strategy was in there.

24 Well, it's not considered a THMS in that
25 case if it's in their design basis. But, there's

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1 very few.

2 CHAIR STETKAR: You said it's one or
3 two. Because I think the last meeting we had, like
4 close to a year ago, you were kind of guessing about
5 20 percent of the sites.

6 MR. RILEY: Yes, it was a larger number
7 at that time. But, I re-performed a strategy
8 recently.

9 CHAIR STETKAR: Good.

10 MR. RILEY: And the vast majority of
11 folks are doing either FLEX is okay. Or a modifying
12 FLEX in some manner.

13 There's not many that are doing AMS.
14 And I believe not --

15 CHAIR STETKAR: Oh, is that -- really?

16 MR. RILEY: Yes. And there's one I
17 think that's doing THMS. I didn't get results from
18 everybody out there.

19 And until they actually go through all
20 this, you'll wonder who -- whether it's totally
21 accurate.

22 CHAIR STETKAR: Yes.

23 MR. RILEY: But, right now I got just
24 one for a THMS. So, most folks are being able to
25 modify FLEX.

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1 So, if you're going the modified FLEX
2 route, you're obviously reestablishing your FLEX
3 strategy. Using the FLEX equipment, the general
4 approach for FLEX.

5 You maintain all your key safety
6 functions. And as I mentioned earlier, the basis of
7 the time that you chose for the ELAP here, you need
8 to have established this as part of this evaluation
9 to show that a modifying FLEX is going to work. And
10 here's how it all works together.

11 And then of course, if you're into an
12 alternate mitigating strategy or targeted hazard
13 mitigating strategy, I'm in a situation where I'm
14 using a combination of FLEX equipment and plant
15 equipment to deal with the reevaluated flood.

16 An important part of this is
17 consideration that you don't assume an extended loss
18 of AC power or loss of ultimate heat sink. Loss of
19 access to the ultimate heat sink unless it's caused
20 by the flood.

21 And you work that into the process as
22 you're doing your evaluation. And as I mentioned
23 already, the ultimate mitigating strategy considers
24 that you maintain core and spent fuel core cooling,
25 and containment capability.

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1 Whereas a targeted hazard does not
2 maintain containment capability. But relies on core
3 and spent fuel cooling to minimize any loss of any
4 exposures or releases.

5 One piece that's important to recognize
6 here is, we have in the Guidance said that you
7 consider equipment whose primary function is to
8 support an AMS or a THMS to meet those standards
9 that we've established for FLEX equipment.

10 That was a conscious addition. Addition
11 inclusion in the Guidance to make sure that we
12 maintain the validity of the Appendix E validation
13 process, by showing that we still have the kinds of
14 things in place for ensuring operator actions and
15 reliability of -- feasibility, excuse me.

16 I want to use that word -- of the -- we
17 don't want to get back into that discussion again.

18 MEMBER SKILLMAN: Jim, what -- could you
19 give an example of what a licensee or a plant
20 operator would do for THMS? What would that one
21 plant that is using THMS do that's different from
22 everybody else?

23 MR. RILEY: It basically is a strategy
24 that opens the containment doors and allows the
25 flood waters into it then.

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1 MEMBER SKILLMAN: Okay. Thank you.

2 MR. RILEY: Yes. And then the last
3 thing is another important element in all of this is
4 that we have told folks that they should preserve
5 the FLEX equipment if feasible.

6 And the idea here is to continue to have
7 the use of that equipment to address unforeseen type
8 situations. So, if you can protect it and it's
9 feasible to do so, then that's part of the Guidance.

10 And that's my last slide.

11 CHAIR STETKAR: Any more questions on
12 Appendix G?

13 (No response.)

14 CHAIR STETKAR: Okay. If not, we're
15 running behind time. It's fine. Because we need to
16 understand the fundamental Guidance. And we're
17 going to take probably more time on Appendix H.

18 So, what I'm going to ask folks to do
19 is, I'm going to give you an 11 minute break. Let's
20 reconvene at 10:15.

21 (Whereupon, the above-entitled matter
22 went off the record at 10:04 a.m. and resumed at
23 10:16 a.m.)

24 CHAIR STETKAR: We're back in session,
25 NEI 12-06 Appendix H. Andrew, turn your --

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1 MR. MAUER: Oh.

2 CHAIR STETKAR: There you go. I'm also
3 the microphone police.

4 Andrew, we have Greg Hardy. Greg, are
5 you out there?

6 (No audible response.)

7 CHAIR STETKAR: No? It doesn't sound
8 like it --

9 MR. HARDY: Yes, I am here.

10 CHAIR STETKAR: Here they are, okay, hi
11 Greg, thanks. I just wanted to make sure he's out
12 there in case you needed him.

13 MR. MAUER: Thank you very much.

14 So between John Richards at EPRI and
15 Greg Hardy and myself, we'll go through Appendix H.

16 Good morning. I am Andrew Mauer with
17 NEI. As you heard from Jim Riley as he talked
18 through Appendix G, I think we have a lot of
19 similarity with Appendix H, but there's also obvious
20 differences that we'll walk through, but in terms of
21 the MSA and the process and submittals and having
22 different paths, you know, we do have a fairly
23 similar structure, and I'm sure you have had a
24 chance to look through --

25 CHAIR STETKAR: Andrew, before we get

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1 into the details, when are you going to finish
2 Appendix H?

3 MR. MAUER: So we -- at this point,
4 we're still working on Path 5, so that's what we
5 need to finish Appendix H, and we recognize that we
6 need to do that in a -- on a schedule to support the
7 rulemaking, so sometime later this year.

8 CHAIR STETKAR: Okay. Thank you.

9 MR. MAUER: Yes.

10 All right. So --

11 CHAIR STETKAR: The popping and the
12 snapping is something that I have to apologize for.
13 People, make sure that if you're not talking, keep
14 your mics turned off because that seems to
15 exacerbate it, and we just have to deal with it.

16 MR. MAUER: All right.

17 Heading into this, so I'm going to start
18 with the status slide, and then we'll walk through
19 each of the different paths.

20 So as I think was alluded to, we do not
21 yet have Appendix H complete and total, but what we
22 currently have is guidance for mitigating strategy
23 assessments for all of the plants where the GMRS to
24 SSE ratio is less than or equal to two times.

25 We have worked on development of a

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1 schedule for the mitigating strategy assessments for
2 seismic and for those plants where the GMRS to SSE
3 ratio is less than or equal to two times. Those
4 MSAs will be submitted by August of 2017, but
5 there's quite a few of those that will be submitted
6 by December of 2016, so essentially, the key
7 difference there is Path 1-3, which we'll get into,
8 will be submitted this year, and Path 4 into next
9 August, and those MSAs are underway.

10 Obviously, the guidance in NEI 12-06 Rev
11 2, which includes Appendix H, has been endorsed by
12 the staff earlier this year in the JLD-ISG-2012-01.
13 One difference between Appendix G and H is that for
14 seismic, all of the MSAs do maintain the key --
15 three key safety functions of core cooling,
16 containment, and spent fuel pool cooling, so we do
17 not have this THMS, so that's sort of one
18 difference.

19 Okay. And I think part of the one area
20 that we're still working on is development of an
21 approach for those plants with a GMRS to SSE ratio
22 of more than two, and so we currently just have a
23 placeholder in there, and we look forward to further
24 developing that and coming back to talk with you on
25 that later this year.

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1 CHAIR STETKAR: That's what -- that's
2 why I asked the question. Later this year starts
3 talking about scheduling and running into walls, so
4 we'll need to keep on top of that as much as
5 possible, with both you and the staff --

6 MR. MAUER: Yes, of course.

7 CHAIR STETKAR: -- because you're going
8 to have to revise your guidance also.

9 MR. MAUER: Of course, absolutely.

10 So we have a flow chart which you've
11 probably seen in Appendix H, but what I've done here
12 is essentially just synthesize what we've got going
13 on in Appendix H, and the way that we have
14 structured the paths for seismic is really tied to
15 the GMRS to SSE ratio, so we'll step through each of
16 these in subsequent slides, Path 1-4 at least, but
17 for the first path, it's for those plants where the
18 GMRS is bounded by the SSE.

19 For Path 2, it's those plants where the
20 GMRS is bounded between 1 and 10 Hz, but there is a
21 high frequency exceedance greater than 10 Hz, and
22 then for Path 3, it's those plants where the GMRS to
23 SSE -- excuse me, the GMRS exceeds the SSE but is
24 bounded by the IPEEE spectrum between 1 and 10 Hz.
25 And then for Path 4, it is those plants where the

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1 GMRS exceeds the SSE with a ratio of two times or
2 less. So --

3 MEMBER RICCARDELLA: Excuse me.

4 MR. MAUER: Yes sir?

5 MEMBER RICCARDELLA: In Appendix H, you
6 referred to MSSHI. Could you briefly explain what
7 the difference between that and the GMRS is?

8 MR. MAUER: Sure. Do you want to?

9 MR. RICHARDS: Sure.

10 Sure. The MSSHI is the collection of
11 hazard information, so it's uniform hazard spectrum
12 at various levels and all that. That's the generic
13 definition.

14 And the reason that we're putting that
15 whole generic definition in in part is because you
16 might need some of that if you do the risk-informed
17 option out in Path 5 where you're doing a full PRA.

18 MEMBER RICCARDELLA: Okay.

19 MR. RICHARDS: Now the GMRS is a spectra
20 that is between 10^{-4} and 10^{-5} hazard, and that's
21 really the measure that is used in the other paths.

22 MEMBER RICCARDELLA: Okay. Thank you.

23 MR. MAUER: So we actually had plots on
24 here for illustration. I don't know if you have --
25 do you have them in your hard copies? Because I

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1 don't see them on the screen here, but you've got
2 them in front of you? Okay. All right.

3 So for Path 1, as I mentioned, these are
4 the plants where the GMRS is bounded by the SSE at
5 all frequencies. For these plants, additional
6 evaluation under Appendix H is unnecessary. FLEX
7 strategies can be implemented as designed without
8 any further seismic evaluations. So -- yes?

9 MEMBER RICCARDELLA: In that you
10 referred to except for narrow band exceedances? Can
11 you help me with what you mean by narrow band
12 exceedances?

13 MR. RICHARDS: Yes. Narrow band
14 exceedances would be a small frequency range where
15 there is a possibility of a minor exceedance, and in
16 the NTTF 2.1 evaluations, those plants are screened
17 out from doing any more work because those narrow
18 band exceedances are not really damaging.

19 MEMBER RICCARDELLA: Okay.

20 MR. RICHARDS: So the same screening
21 philosophy is being used here in the mitigation
22 strategy.

23 MEMBER RICCARDELLA: Okay. Thank you.

24 MR. MAUER: We can get the illustrations
25 on the screen now.

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1 All right. So for Path 2, these are the
2 sites where there is a GMRS exceedance only in the
3 high frequency range, so we will be performing
4 mitigating strategy assessment to evaluate the high
5 frequency sensitive plant equipment, and then
6 obviously what this will do is confirm that the FLEX
7 strategies can be implemented or identify where we
8 may need any plant modifications to ensure that FLEX
9 still works.

10 So I would -- if you're familiar with,
11 as John mentioned, the NTTF 2.1 activities in
12 response to the 50.54(f) response, there is a --
13 quite a bit of work underway to look at high
14 frequency, so the Path 2 effort leverages a lot of
15 that work with a scope focused on mitigation,
16 obviously.

17 CHAIR STETKAR: Andrew, on -- only
18 question I had on Path 2 is that in there, in the
19 guidance, you provide examples of things that people
20 ought to think of, which is good. You mention
21 things like I'll call it relay chatter, but high
22 frequency effects that could inadvertently open BWR
23 ADS valves or PWR pressurizer power-operated relief
24 valves.

25 A little bit of a concern is that people

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1 will take that -- when you write it, they will
2 follow, when you don't write it, they won't. They
3 will take that very literally and look only at those
4 things. There's a bunch of other things where the
5 same type of phenomena can put you outside the
6 fundamental precepts of the scenarios that have been
7 contrived for these assessments, and I'm thinking
8 about things like well, BWRs have reactor water
9 cleanup systems, PWRs have letdown lines. There are
10 other ways of getting LOCAs than simply the two that
11 you've listed.

12 There are also effects that can cause
13 you overcooling transients. You can get open steam
14 generator atmospheric relief valves on pressurizer -
15 - on pressurized water reactors, turbine bypass
16 valves. Is it your intent for people to only look
17 at the two things that you listed, or is the intent
18 to remind them that they need to look at any high-
19 frequency effects that could cause departures from
20 the no LOCA, no overcooling type of assumptions
21 that's built into these assessments?

22 And if it is the broader intent, you
23 either need a lot more examples, or you need to
24 clarify what people ought to be looking at.

25 MR. RICHARDS: So you're looking for two

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1 conditions, I would say. One of them is where
2 you've got a sealant or lockout --

3 CHAIR STETKAR: Yes.

4 MR. RICHARDS: -- circuit, okay? So
5 that's the first thing.

6 The second one is you need to have some
7 substantial volume of water loss.

8 CHAIR STETKAR: You need to be outside
9 of the scope of the assumptions that people are
10 making, and that is that the water loss is limited
11 to recirculation pump seals or reactor coolant pump
12 seals and that the secondary side of the plant is
13 limited by things like stable heat removal.

14 MR. RICHARDS: Right, so within FLEX,
15 they're prepared to deal with certain losses, and
16 you need to confirm you're not creating losses that
17 are beyond what they've already been able to handle.

18 CHAIR STETKAR: And that's my whole
19 point --

20 MR. RICHARDS: And that is correct.

21 CHAIR STETKAR: -- if you have a three-
22 inch line open that is not called a pressurizer
23 power-operated relief valve, that might violate that
24 condition. So all I'm saying is that if you point
25 people to look at only two things, they will look at

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1 only those two things and say I've satisfied the
2 guidance. I don't have a sealant circuit on any of
3 those, so therefore, they might pop, but I don't
4 care.

5 Others -- other lines, other
6 connections, might have sealant, I don't know, I
7 didn't -- I don't design the plants.

8 MR. RICHARDS: Yes.

9 CHAIR STETKAR: I only know how people
10 respond to guidance.

11 MR. RICHARDS: Yes. So what it says is
12 you need to be able to confirm the function.

13 CHAIR STETKAR: Exactly, and the
14 functions are no losses greater than what is assumed
15 in your analysis, which is --

16 MR. RICHARDS: That's correct.

17 CHAIR STETKAR: And stable secondary
18 heat removal for pressurized water reactors --

19 MR. RICHARDS: That's correct.

20 CHAIR STETKAR: -- meaning I don't have
21 overcooling transients --

22 MR. RICHARDS: Yes.

23 CHAIR STETKAR: -- because that gets me
24 on -- that's a different trajectory that I need to
25 deal with.

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1 MR. RICHARDS: Right.

2 CHAIR STETKAR: On a boiler, it's, you
3 know, it looks like a LOCA, so I don't need to talk
4 about overcooling, but --

5 MR. RICHARDS: Right, right, and --

6 CHAIR STETKAR: So I --

7 MR. RICHARDS: -- I can tell you that we
8 are working with industry to provide some examples
9 that we've spent a fair amount of time evaluating
10 those scopes, and the examples go through the kind
11 of things that people should review to validate that
12 they're not having unexpected losses.

13 CHAIR STETKAR: Okay. Thank you.

14 MR. MAUER: So for Path 3, this is the
15 seismic version of an alternate mitigating strategy.
16 In this path, it applies to a limited number of
17 plants where the IPEEE capacity spectrum bounds the
18 GMRS. It's been accepted by the NRC for the purpose
19 of the 50.54(f) response for IPEEE adequacy.

20 And the mitigating strategy assessment
21 is based on that IPEEE evaluation which has
22 demonstrated safe shutdown paths.

23 CHAIR STETKAR: Andrew, let me ask you,
24 I -- we don't have enough time for me to rant about
25 IPEEE, so what -- let me ask you this, what -- how

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1 do I have confidence that what was done back in the
2 IPEEE days was technically adequate to support this
3 type of assessment today?

4 Given the fact that the plant has
5 probably changed, that the reason that I did the
6 IPEEE was to somehow quickly identify things that I
7 might call a vulnerability, but somebody else might
8 not call a vulnerability, how do I know that those
9 models are sufficiently broad and deep for me to
10 make these types of conclusions today?

11 MR. MAUER: Well, I would start with the
12 fact that this is only applying to a very limited
13 number of plants. There's about seven or eight
14 plants I believe that are eligible for this, and
15 it's my understanding that we're probably in the
16 ballpark of three or four or less that may actually
17 be using this approach, so let me start with sort of
18 some broad scope there so you understand the
19 population.

20 CHAIR STETKAR: Okay.

21 MR. MAUER: But obviously, that set of
22 plants has gone through and justified to the NRC for
23 the purpose of the 50.54(f) response that the IPEEE
24 is adequate, and that has been reviewed by the NRC
25 and accepted, so I have to point back to that

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1 process --

2 CHAIR STETKAR: Okay, I'll ask the staff
3 when they come up. Let's go on.

4 MR. MAUER: Okay.

5 So that's sort of the -- I appreciate
6 the question on the basis there. So obviously, as
7 we looked at the mitigating strategy assessment for
8 Path 3, we want to make sure that all the efforts
9 necessary to make the IPEEE whole, which were
10 already underway under 2.1, need to be obviously
11 followed through here under Path 3, and then
12 obviously the IPEEE did not look at the spent fuel
13 pool cooling, so we will go back under Path 3 and
14 address the spent fuel pool cooling, and so we
15 address that in the guidance, similar here to what
16 we do under Path 4.

17 What I would say, and I mentioned it,
18 that there are seven or eight sites that are
19 eligible for this, they may not all use it, is that
20 any plant that is eligible for Path 3 may also
21 follow Path 4, which is modified FLEX, and we're
22 starting to see some interest in heading that way.
23 So just because a site is eligible for Path 3, it
24 certainly has the option to go back and look at
25 modifying FLEX under Path 4.

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1 So for Path 4, this is I'd say the most
2 -- the largest set of plants under any path so far.
3 These are the sites where the GMRS exceeds the SSE
4 between 1 and 10 Hz but is a low to moderate
5 exceedance of less than two times.

6 If you're familiar with Path 4, it's got
7 really a three-step process. The first relies on
8 the result of the expedited seismic evaluation
9 process, so it would take that process and that
10 evaluation which was done, and basically it was
11 performed as a snapshot, and that would continue
12 under a mitigating strategy, so we would change the
13 purpose of what we did there to leverage it for this
14 effort going forward.

15 It also relies on a qualitative
16 assessment of certain SSCs based on seismic
17 experience. Those SSCs and the assessment are
18 provided in Appendix H under Step 2. And then for
19 the remaining FLEX SSCs identified in Step 3, such
20 as the FLEX storage building, hall pass, et cetera.
21 It will perform a quantitative assessment of those
22 SSCs and look at any modifications that might be
23 necessary for FLEX, so it's a three-step process
24 that relies on those three parts as described in
25 Appendix H in more detail.

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1 Obviously, we'll go back and, in the
2 same way we look at it in Path 3, we'll address
3 spent fuel pool cooling, and then for any sites in
4 Path 4 that also have high frequency exceedance,
5 they will layer onto Path 4 or Path 2 evaluation, so
6 -- but it's pretty straightforward.

7 And obviously, at the end of the day,
8 we'll either confirm that the FLEX strategies can be
9 implemented as designed or identify what
10 modifications might be necessary for the new hazard.

11 MEMBER RICCARDELLA: You said Path 4 had
12 the majority of plants? What's the approximate
13 breakdown of plants in the various categories?

14 MR. MAUER: So this is -- so going off
15 my memory, we've got about nine to ten in Path 1.
16 There might be a handful in Path 2. Seven or Eight
17 in Path 3, eligible --

18 MEMBER RICCARDELLA: Like you said, like
19 three to four --

20 MR. MAUER: -- eligible, yes, so that is
21 right.

22 MEMBER RICCARDELLA: And all the rest --

23 MR. MAUER: And then Path 5 has 20
24 sites, so we can do the difference there.

25 MEMBER RICCARDELLA: All right. I

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1 thought the 2.1 evaluation was like one-third, one-
2 third, one-third, roughly.

3 MR. MAUER: What do you mean?

4 CHAIR STETKAR: It could be sites versus
5 units. I mean, you know, how many sites are there
6 that --

7 MR. MAUER: Yeah, I was going by sites,
8 sorry.

9 CHAIR STETKAR: -- so 20 is sort of --

10 MEMBER RICCARDELLA: Okay.

11 CHAIR STETKAR: -- a third of 70.

12 MEMBER RICCARDELLA: A third --

13 CHAIR STETKAR: Right.

14 MEMBER RICCARDELLA: Thank you.

15 CHAIR STETKAR: And you're not going to
16 discuss Path 5 today, right?

17 MR. MAUER: We are not --

18 CHAIR STETKAR: Okay, because I had
19 questions on Path 5. I think in the interest of
20 time, we'll postpone that until you come back.

21 MR. MAUER: Yes, we appreciate that. We
22 haven't even discussed Path 5 with the staff --

23 CHAIR STETKAR: Yes, okay, and --

24 MR. MAUER: -- and we haven't really
25 discussed it with the whole industry yet and it's

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1 still under development.

2 CHAIR STETKAR: I'm kind of a detail
3 guy, so they tend to be details, and they may
4 change.

5 So any members have any questions for
6 NEI on the seismic evaluations?

7 MEMBER BROWN: I just have one question
8 for my own understanding: why does each of these
9 paths for a safe shutdown earthquake have a
10 different line? I would have thought --

11 MR. MAUER: Those are just examples.

12 MEMBER BROWN: Oh, okay --

13 MR. MAUER: I am sorry --

14 MEMBER BROWN: -- so they're --

15 MR. MAUER: -- these are the examples,
16 yes.

17 MEMBER BROWN: They could be applied to
18 any, you know, it's dependent upon where you are in
19 the country for the --

20 MR. MAUER: Sure.

21 MEMBER BROWN: -- what the SSE --

22 MR. MAUER: Any given plant, the spectra
23 is going to look different.

24 MEMBER BROWN: I just thought you were
25 going through all the paths and all of a sudden,

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1 there's four different --

2 MR. MAUER: No.

3 MEMBER BROWN: -- safe shutdown
4 earthquakes, I just wanted to make --

5 MR. MAUER: Sorry, yes. So these are
6 just --

7 MEMBER BROWN: I got it.

8 MR. MAUER: -- to demonstrate, yes, just
9 to demonstrate different spectra.

10 MEMBER BROWN: Thank you, I appreciate
11 it.

12 MR. MAUER: Sure.

13 CHAIR STETKAR: Anything else for
14 industry? If not -- yes, John.

15 MR. RICHARDS: I would make one quick
16 comment.

17 On the IPEEE thing, I don't want to pass
18 without saying one comment, and that is that under
19 the 2.1 evaluation, plants were required to submit a
20 fair amount of information to the staff for their
21 evaluation. They had to confirm that they dealt
22 with the vulnerabilities. They had to evaluate
23 significance of substantial plant changes since the
24 time it was done. So there's a fair amount of work
25 that was done.

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1 CHAIR STETKAR: I'll ask the staff
2 because --

3 MR. RICHARDS: And staff.

4 CHAIR STETKAR: -- you said they
5 accepted them, so, you know, I'll -- you've got the
6 by on this one.

7 Anything else for this NEI?

8 (No audible response.)

9 CHAIR STETKAR: If not, thanks a lot.
10 You crammed a heck of a lot of material into, you
11 know, a little bit longer. By the -- we really
12 appreciate it, because as I said, we need to better
13 understand. As we come closer and closer to
14 understanding how people are actually going to
15 implement not only the FLEX strategies but perform
16 the assessments to have confidence that they'll
17 work, we start to have needs to better understand
18 both the industry's perspective and the staff's, so
19 really appreciate you folks coming in and giving us
20 this run-through.

21 And with that, we'll switch gears I
22 guess, and I don't know who is coming up now. I
23 don't follow these things.

24 One more presentation. Oh, I'm sorry,
25 that's right, I keep forgetting because we are going

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1 to get comments on -- NEI's comments on the proposed
2 rule. Jim? You're up.

3 MR. RILEY: Changes at the table. John,
4 if you can just give us a minute, Jon Rund and Steve
5 Kraft are going to join us up here. Andrew will
6 stay, and Mike, you can split. Just give us just a
7 minute or two to make that happen.

8 CHAIR STETKAR: By the way, Greg, thanks
9 for your input, if you're out there. Good talking
10 to you.

11 MR. HARDY: Glad I could help.

12 CHAIR STETKAR: We're now going to put
13 you on mute, so goodbye.

14 MR. HARDY: All right. Thank you.

15 MR. RILEY: Just so I --

16 CHAIR STETKAR: Full disclosure, Greg
17 and I used to work together in a previous life, so
18 we can say these things.

19 MR. RILEY: Just so I don't run you into
20 problems with your agenda schedule today, how much
21 time do we want to target for this? We had --

22 CHAIR STETKAR: As little as possible.

23 MR. RILEY: As little as -- well, we can
24 make it go quick. Again --

25 PARTICIPANT: We?

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1 MR. RILEY: Yes.

2 (Laughter.)

3 MR. RILEY: Thank you very much for your
4 time. We're out of here.

5 Again, I am Jim Riley with NEI, and I'd
6 like to talk about the comments on the rulemaking,
7 the mitigating beyond-design-basis events
8 rulemaking.

9 We submitted a -- and I'm joined by
10 others at the table here. I'll be doing the
11 presentation, but the folks you see at the table
12 were the core team, if you will, that helped pull
13 all these together, so if you do have questions that
14 get into the details, then they're here to help me
15 kind of sort that out.

16 So comment letter was submitted per the
17 Federal Register notice in February. Just a laundry
18 list of how many comments we had here. This -- a
19 lot of pages in the comment letter, but I don't
20 think that should indicate that we're disconnected
21 with where the rulemaking is going. I think in
22 general, the comments were of the nature of
23 refinements. We did answer the questions that the
24 NRC posed in their -- in the Federal Register as
25 part of it too, and we also included some revised

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1 documents that are affected by the comments on the
2 rulemaking to kind of illustrate where we're going
3 with this.

4 At this point in time, I don't see any I
5 guess you'd call them showstopper issues between us
6 and the staff on the kinds of comments we had. We
7 did provide some suggested changes to the rule
8 language to address some of our comments, and I'll
9 go over those as I go through it.

10 We listed about five or so comments in
11 the comment letter that were the more major comments
12 that we made, and that's all I'm going to be going
13 over today, so bear with me, we'll kind of go
14 through that.

15 So the first one of those comments, more
16 significant ones, has to do with implementation
17 time. This was also a question that was asked in
18 the rulemaking package, where the draft rulemaking
19 package suggested two years' implementation.

20 We proposed that a flexible arrangement
21 be set up where the licensees would have 90 days
22 from the effective date of the rule to submit
23 implementation times for their site, and the reason
24 we suggested this is the status of the sites varies
25 considerably with respect to where they are in

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1 understanding the effects of the reevaluated hazard,
2 and that's part of implementation of the rule, of
3 course, so that some sites haven't completed their
4 evaluations, some sites are in the middle of their
5 mitigating strategies assessments, et cetera, and it
6 just didn't seem to make sense to us to have a hard-
7 and-set rule implementation time frame.

8 It would probably end up with a lot of
9 exemptions, and I don't think anybody wants that, so
10 our proposed rulemaking was to -- or excuse me,
11 proposed words were to allow flexibility based on a
12 schedule that would be approved by the staff.

13 The second main comment had to do with
14 the change control process. This was another
15 question that was asked within the Federal Register
16 notice. In this case, we were largely in agreement
17 with what was in the rulemaking package for change
18 control, which basically said to -- that the change
19 that you envision has to be able to continue to meet
20 the rule, and if it doesn't, then you had to submit
21 for NRC approval of the change.

22 We're in agreement with that. The one
23 couple of comments that we made were that the
24 guidance needs to be clear on some issues that are
25 understanding how you would apply that change

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1 control process with respect to design-basis and the
2 non-design-basis type situations, and with respect
3 to other change control processes. I am sure you're
4 aware that there's quite a number of other change
5 control processes within the regulations that
6 pertain to specific programs, 50.59 overall, and
7 there's others for EP, and its fire protection, et
8 cetera.

9 We need to be clear on when those apply,
10 and basically, the position we're taking is to
11 establish that clarity, and you assign -- or you
12 evaluate the change with respect to how it affects
13 those different areas, but you need to make clear
14 the fact that that is the intent.

15 With respect to addressing the
16 reevaluated hazards, I think of the comments that we
17 made, this was the most significant from the
18 standpoint that we suggested a number of changes to
19 the rule language for this, and the reasons that we
20 made those suggested changes are laid out here.

21 The way that we read the draft
22 rulemaking package, the effects of mitigating
23 strategies would be considered only on the
24 equipment, and we believe the intent of the rule was
25 to evaluate the effects of the reevaluated hazard on

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1 mitigating strategies in total, not just the
2 equipment. That was a main reason why we broke it
3 down, and the breakdown that we provided in the
4 proposed rulemaking language we provided with our
5 comments lays out specifically the three different
6 approaches to mitigating strategies that Andrew and
7 I were both talking about. FLEX is okay, AMS, THMS,
8 et cetera. We aligned that in a way that fits
9 within that framework.

10 Another thing that we felt was important
11 is to allow for targeted hazard mitigating
12 strategies. Earlier today you asked me about that,
13 and I mentioned it doesn't maintain containment
14 capability. The original rule language was cloudy
15 on that, and we tried to clean that up with the
16 language we provided.

17 Another main reason we did what we did
18 was to allow utilization of risk insights. There's
19 one of the sub-items under (b)(1)(D) I guess it was
20 had address the use of risk insights for -- and that
21 was specifically for Path 5 on seismic, we put those
22 words in.

23 And I'll throw one other item in here.
24 It's not on the bullets, but it's one of the reasons
25 we also changed 51.55(b) the way that we did.

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1 The way the original rule language was
2 set up, it related the mitigating strategies
3 specifically to the submittal of the 50.54(f)
4 letter. The fact is that a number of plants will be
5 revising the 50.54(f) hazard evaluations as part of
6 this whole process. We felt it was important to
7 ensure that the rule language not create a problem
8 with making a revision to the reevaluated hazard.

9 Folks are doing that to remove some
10 conservatisms and reduce the effect on the plant and
11 all those kinds of good reasons. The original rule
12 language we felt didn't allow that. What we
13 proposed does.

14 The next main comment had to do with the
15 use of adequate protection. In the regulatory
16 analysis, adequate protection was cited as a reason
17 for the multi-source dose assessment. We don't
18 believe that's a valid use of adequate protection,
19 that there ought to be a cost-justified substantial
20 increase in safety with respect to the change to do
21 the multi-source dose assessment.

22 I will point out that industry is
23 already taking on that capability. They have that -
24 - established that as part of the changes that they
25 have been making post-Fukushima so that that

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1 capability is going to be in place at the sites, but
2 the main point here is that we don't believe that
3 adequate protection is a -- should be applied to
4 this particular requirement.

5 And then the last thing was on spent
6 fuel pool instrumentation. If you look the way the
7 draft rule language was set up, (c)(4) I believe it
8 was which talked about spent fuel pool
9 instrumentation specifically talked about it as
10 being included with the mitigating strategies
11 equipment that was described in Section B, and we
12 don't believe that's a legitimate way to do things
13 because the spent fuel pool instrumentation was
14 required under a different order. The orders were
15 separate. The requirements were separate.

16 Spent fuel pool instrumentation supports
17 the mitigating strategies. It doesn't -- it isn't
18 included among the mitigating strategies. So the
19 way that we set up the rule language in our
20 suggested comments separated and made that clear,
21 the distinction between spent fuel pool
22 instrumentation and mitigating strategies.

23 So in general, I would reiterate we
24 don't believe we have any significant misalignments
25 with the staff. Obviously, there is value to be

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1 obtained by having some discussions, talking about
2 what our comments were, what they mean, and
3 refinements to what we proposed in the way of rule
4 language that fits perhaps better than what we might
5 have suggested, and we anticipate being able to
6 engage with the staff and have those conversations
7 over the remainder of this year.

8 As you know, the rule package is
9 supposed to go up to the Commission at the end of
10 the year, and we anticipate having the opportunity
11 to work on these comments with the staff over the
12 next months to come.

13 And that's my last slide.

14 MEMBER SKILLMAN: Do we have opportunity
15 to ask for an item that might not have been on your
16 top five?

17 MR. RILEY: Gee, do I get a chance to
18 say no?

19 (Laughter.)

20 MEMBER SKILLMAN: You do because I will
21 defer --

22 MR. RILEY: Of course not, go on.
23 Please, go ahead.

24 MEMBER SKILLMAN: In the reading that
25 I've done, apparently there was pushback, or at

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1 least a challenge, to whether or not the FLEX should
2 be in the maintenance rule.

3 And I just want to say one or two
4 things. If you go back to -- if we go back to 1985,
5 1988, when 50.65 was being proposed, you might
6 recall that there was this huge pushback from
7 industry. Nobody wanted the NRC in their
8 maintenance office.

9 And in the time that has passed, I would
10 observe that use of the maintenance rule, the system
11 health reports, the identification of A1 and A2
12 systems, has done more to increase reliability and
13 safety than almost any other body of regulation.

14 So it just seems to me from a process
15 perspective including the FLEX equipment in
16 maintenance rule gives the utility a true upper
17 hand. And let me go one step further. Until the
18 gentleman -- until Mr. Powell mentioned it this
19 morning, I considered just not making this comment,
20 but when he said you know we're going to hook this
21 FLEX equipment up because in risk-informed
22 operational decision-making, it gives us some
23 defense-in-depth for when we're shut down, I said to
24 myself, this gentleman is saying what I think most
25 of industry is thinking. Since we've made the

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1 investment in FLEX, it gives us safety backup.

2 And I would observe the shift supervisor
3 is taking credit for this equipment for his safe
4 plant, that safe shutdown equipment plus the FLEX
5 equipment should be subjected to the same level of
6 scrutiny that a system under maintenance rule
7 provides. I think that's worthy of consideration.

8 MR. KRAFT: Well Dick, let me respond to
9 that.

10 Not questioning the validity of the
11 experience you're citing. Certainly you saw that at
12 Palo Verde when you were there back in May. We
13 actually walked around behind the plant together,
14 and one of the FLEX pumps was strapped down into
15 place. In fact, the only hazard being created were
16 the tie-down straps because I remember tripping over
17 one.

18 But it was not hooked up. It -- the
19 hoses were there, they were ready to go. And there
20 are going to be plants that can look at their
21 shutdown analysis, their shutdown PRA. Palo Verde
22 is in a -- now I'm not saying this isn't true
23 elsewhere, but Palo Verde is in a unique situation,
24 how much because of the location, the desert, the
25 whatever, their primary fear is fire.

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1 And they make that, in the presentation
2 that was made to you all by Randy Edington, the CNO,
3 he makes that clear, and they train on that. So
4 there is a value there, and it probably is largely
5 the value in other modes than mode one, probably a
6 good point. And others will take advantage of it.

7 Now didn't NRC endorse our one-page
8 change to that guidance that says you can use the
9 maintenance rule provided, if you can, how did it
10 say it, the maintenance rule as long as you're
11 consistent with the order. Once you go outside the
12 order, it's a different story, and then you have to
13 look at it. You don't have to actually do -- you
14 have to look -- we get -- we asked for one page, was
15 it 96 or 94? I think it was 94.

16 PARTICIPANT: 93-01.

17 MR. KRAFT: 93-01, thank you.

18 CHAIR STETKAR: You have to identify
19 yourself first, so -- it's on.

20 MR. TSCHLITZ: Okay. Mike Tschlitz,
21 NEI. And my group at NEI has been working on
22 addressing the issue with FLEX equipment being
23 within the scope of the maintenance rule. We have a
24 draft revision that has been submitted to the staff
25 review, NUMARC 93-01, which provides the scoping

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1 criteria for things that should be included in the
2 maintenance rule.

3 What I will point out, without getting
4 into the details of what's in that change or
5 proposed change to NUMARC 93-01, is that in NEI 12-
6 06, the industry is committed to maintaining the
7 FLEX equipment per EPRI guidance document, and if
8 you were to go look at the details of that EPRI
9 guidance document that the industry is committed to,
10 it's not that different from the maintenance rule.

11 There is testing. It may be more
12 appropriate than the maintenance rule for that type
13 of equipment, to maintain it per that guidance. So
14 I would just caution and say if you were to look at
15 -- in detail, at what has already been committed to
16 by the industry, there is not a big delta between
17 what's in that program and what the maintenance rule
18 would require.

19 But it is different, and we are trying
20 to keep it within that program and not have it
21 covered by two separate programs. So that's my
22 comment.

23 MEMBER REMPE: But to make the point
24 you're trying to make a little more clear, could you
25 cite one example where the EPRI document is a better

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1 way to go than something in the maintenance rule?

2 MR. TSCHLITZ: Well the EPRI document is
3 designed for equipment that's in a storage facility
4 that's maintained in a standby condition and
5 periodically takes that equipment out and may test
6 it --

7 MEMBER REMPE: So the testing
8 periodicity? I want a specific example. I
9 understand where the FLEX equipment is located, just
10 an example, it's how frequent you test or something
11 like that?

12 MR. TSCHLITZ: Right, that's all
13 included in the EPRI guidance --

14 MEMBER REMPE: Okay.

15 MR. TSCHLITZ: -- document.

16 MEMBER REMPE: And it's different than
17 what you see --

18 MR. TSCHLITZ: The maintenance rule is,
19 you know, a performance-based rule, so, you know,
20 you could question whether or not a performance-
21 based rule is really appropriate for this equipment
22 that's in the standby condition all the time, but
23 what I'm offering is what's in the EPRI guidance is
24 going to get you about the same thing as the
25 maintenance rule gets you already, so I wouldn't

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1 argue that there is a big difference.

2 And some people are basically saying
3 they can credit what's in the EPRI document towards
4 satisfying the maintenance rule. I don't think we
5 would go that far, but there is not a significant
6 difference from a safety perspective between the two
7 maintenance programs, so I don't think it's a
8 significant issue.

9 MEMBER REMPE: Thank you, that helps the
10 discussion, thank you.

11 DR. SCHULTZ: Jim, you mentioned the --
12 that a licensee might use the changes in analysis
13 assumptions to play against a change in the hazard.
14 If the hazard changes, then they might change their
15 analyses assumptions to demonstrate the complex
16 equipment is appropriately covering that.

17 MR. RILEY: Steve, I am lost. I don't -
18 - help me --

19 DR. SCHULTZ: You talked about the
20 change in analysis assumptions, and that that could
21 be utilized if the hazard changes, if the magnitude
22 of the hazard changes in a reevaluation, that that
23 might be one way it could be addressed by the
24 licensee.

25 MR. RILEY: Yes.

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1 DR. SCHULTZ: And my question is, is the
2 change in analysis assumptions also a valid way in
3 which a licensee could move in their own independent
4 evaluation -- or change in the change control
5 process?

6 MR. RILEY: Oh.

7 DR. SCHULTZ: I am hoping not, but --

8 MR. RILEY: Yes, I don't -- the way that
9 we would propose the change control process, as long
10 as you're able to say you're still meeting the rule,
11 it would not be anything that would require an NRC
12 approval, if I am understanding you correctly.

13 So it has to do -- the change control
14 process as written under the draft rule asks you to
15 evaluate whether you continue to meet the rule or
16 not, and the change control process -- change in
17 analysis, as long as you're able to still make the
18 statement that you meet the rule, would not require
19 NRC review.

20 DR. SCHULTZ: It would not?

21 MR. RILEY: Would not.

22 DR. SCHULTZ: Okay. We'll see what the
23 NRC says. Thank you.

24 CHAIR STETKAR: Anything more for NEI?

25 (No audible response.)

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1 CHAIR STETKAR: If not, thanks again.
2 Appreciate it. Didn't mean to overlook this
3 section. I tend not to follow agendas, but it's
4 important to do that.

5 We're going to switch gears now and talk
6 about the three draft reg guides that accompany the
7 draft -- the proposed rulemaking, so the staff will
8 come up and talk about that.

9 In the interest of time, I'm just going
10 to tell you that we'll probably run a little bit
11 long this morning. It's a subcommittee meeting. I
12 have flexibility to do that. Since I'm the chairman
13 this afternoon, I have even more flexibility to do
14 that, so to the members, don't necessarily feel too
15 constrained because of the fact that we're running
16 long here. I don't want to make it too long, but
17 there you go.

18 MEMBER POWERS: Your flexibility is of
19 course limited by rebellion among the members.

20 CHAIR STETKAR: Pardon?

21 MEMBER POWERS: Your flexibility is
22 limited by rebellion among the members.

23 CHAIR STETKAR: Yes, that's true, that's
24 true. I tend to run subcommittee meetings kind of
25 like the pirate's rule. There are general

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1 recommendations, but provided that there's not a
2 wholesale mutiny --

3 As soon as we get the paperwork handed
4 out here, we'll proceed. Good? Eric, you're up.

5 MR. BOWMAN: All right. Pending the
6 existence of any questions, I'll try to get us back
7 on track.

8 I'm Eric Bowman. I'm Special Advisor in
9 the Japan Lessons Learned Division. One of the
10 leads in the working group for the Mitigation of
11 Beyond-Design-Basis Events Rulemaking.

12 Three draft guides that we published for
13 comment, along with the proposed rulemaking, the
14 topics have combined this into just one single
15 presentation. It's a fairly short presentation and
16 I can answer any questions you have about the draft
17 guides. They are still in draft form. And we
18 received a number of comments on them that we're
19 taking into account as well as the comments on the
20 rulemaking to the extent that results in changes in
21 the rulemaking.

22 The first of the draft guides is Draft
23 Guide 1317 for the wide-range spent fuel pool level
24 instrumentation. That draft guide is proposing to
25 take forward the endorsement of NEI 12-02, Revision

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1 1, that was executed in 2015 -- or 2012 in JLD-ISG-
2 2012-03.

3 We are not intending any substantive
4 changes in the implementation of the wide-range
5 spent fuel pool instrumentation from what was
6 implemented under the Order EA-12-051.

7 The final reg guide will be Reg Guide
8 1.227 and it will reflect the resolution of comments
9 and any changes that have happened in the rule text,
10 of course, based on the comments that we receive
11 from NEI or from other external stakeholders.

12 CHAIR STETKAR: Two questions. Nothing
13 on the reg guide itself or the draft guide. But NEI
14 12-02, this is, I'll just make these comments so you
15 can take notes because of the time.

16 NEI 12-02 says the instrumentation
17 requirements are instrumentation -- I'm sorry, let
18 me -- there are certain pools that are exempt from
19 the instrumentation requirements. And in particular
20 it says water-filled structures within primary
21 containments that contain temporary fuel storage
22 locations at some boiling water reactors and
23 pressurized water reactors.

24 At some plants that I've seen, those
25 structures are used for offloading the full core and

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1 holding it in that place for the entire refueling
2 outage, so it can have a fairly large complement of
3 fuel assemblies, granted for only for the length of
4 the outage, but length of the outage. And I was
5 curious why they're in particular exempt?

6 MR. BOWMAN: Well, in particular the
7 situation you postulate is an offload of the entire
8 core. The purpose behind EA-12-051 was to avoid
9 distractions from combating of casualty in the
10 reactor core due to uncertainties in the whether or
11 not the spent fuel pool in question was also
12 undergoing a casualty.

13 Although we don't expect to have
14 casualties in spent fuel pools because they are very
15 robust structures, if you offloaded all of the fuel
16 from the core there would be no potential for an
17 accident happening in the core, so there would be no
18 potential for destruction from that accident.

19 CHAIR STETKAR: Okay.

20 MR. BOWMAN: So, therefore, I mean for
21 the very limited time in which you're in the process
22 of offloading the fuel, that might be a
23 consideration. But it's a very limited window of
24 opportunity for an event to happen. So,
25 consequently, the potential risk of that occurring

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1 is pretty low.

2 We didn't impose that as a requirement
3 in the EA-12-051. And we have not gone to look to
4 effect of anything further on wide-range spent fuel
5 pool instrumentation in the rulemaking.

6 CHAIR STETKAR: Second question is that
7 in section 3.4 of NEI 12-02 it basically says, it
8 says for the effects of shock and vibration in the
9 area of instrument channel components used after an
10 event -- I'm sorry. Let me just paraphrase.

11 It says that you have to look at the
12 effects of shock and vibration. And then it says
13 with the exception of battery chargers and
14 replaceable batteries.

15 Okay, I get replaceable batteries. Why
16 batteries, why are battery chargers exempt?

17 MR. BOWMAN: I'd have to look into that
18 --

19 CHAIR STETKAR: Okay.

20 MR. BOWMAN: -- with the text to find
21 out.

22 CHAIR STETKAR: Okay. That again is
23 just I don't -- if you read the stuff and you think
24 about, well, why are they specifically exempting,
25 you know, little piece spots, replaceable batters I

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1 get. That's just a flag. It's not a big deal issue
2 at all.

3 MR. BOWMAN: Understood.

4 The -- Oh, were there any other
5 questions on this draft guide?

6 CHAIR STETKAR: That's what I was going
7 to ask: make sure. Because we're going to switch
8 gears here.

9 So anything more on 1317 fuel pool
10 level?

11 MR. BOWMAN: Okay, draft guide -- it's
12 going backwards on me. Draft Guide 1319 is the
13 subject of the draft guide is integrated response
14 capabilities for beyond design-basis events. That
15 has several NEI documents that we're endorsing.
16 There's an endorsement of the document NEI 12-01 on
17 the staffing and communications analyses.

18 That's being carried forward from the
19 endorsement for the purposes of meeting the Request
20 for Information on the subject of staffing and
21 communications for beyond design-basis events.

22 It also proposes to endorse two
23 additional NEI documents that have been developed,
24 NEI 13-06 and NEI 14-01, that have to do with
25 enhancing the emergency response capabilities. And

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1 those documents include guidance on the Severe
2 Accident Management Guidelines.

3 When we proposed the mitigation of
4 beyond design-basis events rulemaking to the
5 Commission in SECY-15-0065 we had included a
6 proposed requirement for Severe Accident Management
7 Guidelines. And as the committee is no doubt aware,
8 the Commission directed that we remove the
9 requirement for the Severe Accident Management
10 Guidelines from the rule before it was issued as a
11 proposed rule and announced in the Federal Register.

12 Consequently, the original versions of
13 NEI 13-06 and NEI 14-01 reflected the draft proposed
14 rule language that included SAMGs as a requirement,
15 as it would have been proposed.

16 In the comments we received from NEI we
17 have also received revised versions of these two
18 documents that answer to a large extent the
19 direction we also received from the Commission in
20 the SRM on SECY-15-0065 to ensure that any guidance
21 we endorse includes appropriate coordination of the
22 Severe Accident Management Guidelines that are
23 voluntarily maintained by industry with emergency
24 operating procedures, EDMGs and FLEX support
25 guidelines.

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1 And just examples of what is intended by
2 the appropriate coordination, that being appropriate
3 transition criteria, and guidelines in clarity of
4 command and control for transitioning between those
5 sets of guidelines and the Severe Accident
6 Management Guidelines.

7 When the final rule is published, Draft
8 Guide 13-19 will become Regulatory Guide 1.228 and
9 it will reflect the resolution of the comments we
10 received and the updates to NEI 13-06 and NEI 14-01.

11 Are there any questions on this draft
12 guide?

13 (No response.)

14 CHAIR STETKAR: Five seconds of silence.
15 Proceed.

16 MR. BOWMAN: Okay. I'm getting us back
17 on track.

18 The final draft guide to discuss is
19 Draft Guide 13-01. This will become Regulatory
20 Guide 1.226 once we finish resolving comments on the
21 proposed rule and we go to the final rule stage.

22 What we're doing with Draft Guide 13-01
23 is proposing to carry forward the endorsement that's
24 currently in JLD-ISG-2012-01, Revision 1, on the NEI
25 Guidance Document 12-06, Revision 2.

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1 CHAIR STETKAR: Okay. Before we get
2 into more alphabet soup, NEI 12-06, Revision 2 is
3 not yet a complete document for guidance in
4 particular. Appendix H is not complete.

5 So how do we interpret now DG 13-01? Is
6 it a complete document? Will it be revised once NEI
7 12-01 -- or, I'm sorry, 12-06 is updated to Revision
8 3 and is a complete document?

9 What are we dealing with?

10 MR. BOWMAN: Well, the process we're in
11 is the rulemaking process. And the point we're at
12 is we issued for comment Draft Guide 13-01. It's a
13 draft guide and necessarily envisions the
14 incorporation of changes. One of those major
15 changes is the development and inclusion of the Path
16 5 in Appendix H for dealing with seismic PRAs for
17 addressing these reevaluated seismic hazards.

18 We will be continuing to work with
19 industry as well as external stakeholders. And I
20 anticipate sometime this summer we will start having
21 a series of public meetings once we get the proposed
22 guidance from industry on how to deal with the SPRAs
23 for use in the mitigating strategies assessments.
24 And I have no doubt we will be coming back and
25 speaking to the committee on the subject.

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1 CHAIR STETKAR: I have no doubt you'll
2 be coming back either. I just want to make sure
3 that that isn't the day before the draft rule is
4 supposed to be issued. As I mentioned, --

5 MR. BOWMAN: Certainly.

6 CHAIR STETKAR: -- when I read through
7 what's available in NEI 12-06 on Appendix H, I had
8 some questions about how they're approaching things.
9 Now, we didn't discuss that earlier because they
10 didn't want to. That's fine.

11 At some point in time we're going to
12 need to discuss that. So if we can agree that we're
13 going to put the pass-by seismic stuff off until
14 then, I'm okay with that, but I don't want that to
15 get into the standard Fukushima rush, the fact that
16 we now have a brick wall ahead of us and we have to
17 suddenly be accommodating again.

18 MEMBER RAY: John, is it only, is it
19 only Path 5 that we're talking about?

20 CHAIR STETKAR: Well, I don't know what
21 else is. It's all of Appendix H. But most of
22 Appendix H is actually fleshed out through -- well,
23 I don't know whether they're going to change it not,
24 but through the first four paths it's reasonably
25 well developed.

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1 MEMBER RAY: It is. But I'm just
2 wondering whether deferring discussion, further
3 discussion --

4 MR. BOWMAN: Well, we have an approach.
5 I'm willing to discuss everything up to the Path 5
6 stuff, but I don't want to get into the philosophy
7 of some of the assumptions that are made in Path 5.
8 So for example --

9 MEMBER RAY: Well, but I don't want to
10 be repetitious either. And it would seem that some
11 of the bases for, like just pick Path 4 as an
12 example.

13 CHAIR STETKAR: No, that's fine. Path 4
14 is on the table for picking.

15 MEMBER RAY: Well, is it off the table
16 after now or?

17 CHAIR STETKAR: No. Because if changes
18 are made we'll have to revisit.

19 My only, my only warning to both the
20 staff and NEI is we will need time to address this.
21 And we are going to make time to address this
22 because that's why we're having today's meeting. We
23 didn't have enough time the last time we were up
24 against the wall to get something else out. And,
25 you know --

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1 MR. BOWMAN: I understand that. And
2 where we are with it, this is an initial pass with
3 the committee on our initial concept of the comments
4 that we've received on the rulemaking. We're not
5 asking for a letter yet.

6 CHAIR STETKAR: No, no, no. And we're
7 not planning one. We're not planning one.

8 MR. BOWMAN: That will be way down the
9 line closer to the final rule stage.

10 CHAIR STETKAR: But way down the line is
11 still, is still constrained by issuing the draft
12 rulemaking.

13 MR. BOWMAN: Oh yes.

14 CHAIR STETKAR: And that's, that's a
15 hard brick wall.

16 MR. SHAMS: If I may --

17 MR. MAUER: This is Andrew, Andrew Mauer
18 at NEI.

19 Just to close the loop on what the
20 difference is going to be with respect to Rev. 3, as
21 best as I know it today, the primary difference in
22 Rev. 3 is going to be the addition of Path 5. I'm
23 aware of, you know, editorial type changes. And I'm
24 aware of the discussion earlier where there might be
25 some more references to the order. I consider those

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1 editorial. Path 5 is the key difference. We're not
2 going through and changing the rest of it.

3 CHAIR STETKAR: That helps.

4 MEMBER RAY: Well, I just want to
5 complete the thought that because we're not getting
6 ready to write the letter, I just am reluctant to
7 get into discussions that by the time we are ready
8 to write a letter are going to be ancient history.

9 CHAIR STETKAR: That's fine. But I
10 think if we can get feedback to the staff, or as we
11 tried this morning, feedback to the industry that
12 might inform anything -- we had, we had very little
13 discussion in practice on Appendix H with the
14 industry this morning. There were a couple of
15 questions but there wasn't, there wasn't anything
16 that seemed to be of concern, at least among the
17 members here.

18 MEMBER RAY: Well, that may have been an
19 oversight or an error in that regard. I just didn't
20 think it was the right time to delve into the bases
21 for some of the things that are established for the
22 different paths. And I don't feel comfortable doing
23 that at the moment either. But if this is the time
24 to do it, then I'm just asking the question.

25 CHAIR STETKAR: This is the time for us,

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1 as individual members, to at least give the industry
2 and the staff the benefit of any early feedback that
3 we can provide as individual members.

4 Granted the fact that we're not speaking
5 for the ACRS and we're not planning to write a
6 letter on this unless the members here recommend
7 that we bring it to the full committee for a letter,
8 but because it's an evolving process I think both
9 the staff and the industry might benefit from
10 feedback we can give them today rather than waiting
11 until, you know, half past November or something
12 like that.

13 So please don't constrain your comments
14 because you don't think that the timing is
15 appropriate. People will take them and factor them
16 in, you know, as needed now.

17 MR. SHAMS: Mohamed Shams with the
18 staff.

19 I was just going to affirm exactly what
20 you just said. The first four paths for Appendix H
21 are as final as they're going to be. And they're
22 essentially in implementation at this point.

23 So we welcome your feedback and
24 questions now on them.

25 MR. REED: And this is Tim Reed.

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1 I'll just add three thoughts real quick.
2 Number one, our CER process, cumulative effects of
3 regulation process requires us to put out the
4 guidance with the rules. We need a complete set of
5 guidance with the rules. So that's a driver. The
6 Commission is going to be looking for the entire set
7 of guidance. So you have that also to recognize
8 that that's in play here today.

9 And we fully recognize that we're giving
10 our initial thoughts today on the rule. We realize
11 that once we have an idea of the fast-forward on all
12 these issues, okay, we need to get back to you. And
13 I think that's probably more like August/September.

14 Before we do the final rule, in other
15 words, we need at least one meeting between now and
16 November so that we can tell you, Hey, here's our
17 comments. Here's what we think we're going to go
18 technically on the comments. Because I want to hear
19 where you guys are at on that because that's how we
20 have built out the entire rule that you're going to
21 see in November.

22 So that's how I -- so I do, Mr. Stetkar,
23 I do see us having at least another pretty
24 substantive meeting and then the meetings in
25 November and December, so.

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1 CHAIR STETKAR: We'll just have to work
2 on that --

3 MR. REED: Yes.

4 CHAIR STETKAR: -- and make sure that it
5 -- okay, that's enough on that.

6 MEMBER POWERS: What he's telegraphing
7 is a rather substantive subcommittee meeting
8 sometime in --

9 MR. REED: September.

10 MEMBER POWERS: -- September it looks
11 like.

12 MR. REED: Yes.

13 MEMBER POWERS: And we had better block
14 that right now.

15 CHAIR STETKAR: That's, that's what I'm
16 --

17 MEMBER POWERS: Those multiple days now.
18 I mean this is a lot of material.

19 MR. REED: It's going to be a big one.

20 MEMBER POWERS: So if you can look at
21 your schedule and talk to our staff because we have
22 a scheduling problem typically in September --

23 MR. REED: Okay.

24 MEMBER POWERS: -- because we don't have
25 meetings, formal meetings in August. So things tend

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1 to bunch up.

2 MR. REED: That's right. That's right.

3 CHAIR STETKAR: September is a bad month
4 for us. And, in fact, our --

5 MEMBER POWERS: We can accommodate
6 perhaps with rather than constraining it just to be
7 in the subcommittee meeting, we add another week I
8 suppose. We can do a lot of things but we need to
9 know to do it.

10 CHAIR STETKAR: And we have some, we
11 need to have some reasonable assurance that that
12 week is a reasonable target week because --

13 MEMBER POWERS: Exactly so.

14 CHAIR STETKAR: -- because if we do it
15 and then it ends up canceling.

16 MEMBER POWERS: It will be January.
17 Guarantee you it will end up being January.

18 CHAIR STETKAR: We're going to run long.
19 I have a couple of other constraints that I need to
20 take care of, so let's get into DG 13-01.

21 MR. BOWMAN: Okay. The one other thing
22 I wanted to mention about DG 13-01, the process of
23 putting out DG 13-01 was happening in parallel with
24 a revision to JLD-ISG-2012-01 that took place in
25 January. So the most current version of the

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1 guidance for satisfying the requirements of Order EA
2 12-049 is the ISG rather than the draft guide.

3 So building from the changes that
4 happened between the Revision 0 or the ISG to
5 Revision 1 is a better place to start than to look
6 at what was published as the draft regulatory guide.
7 The intent in both is to incorporate the acceptable
8 alternative approaches that have been proposed by
9 industry for complying with the order and approved
10 by the staff, as well as resolving all the lessons
11 learned in the implementation so far.

12 And with that, if you don't have any
13 further questions, that completes my presentation.

14 MR. REED: Five seconds.

15 CHAIR STETKAR: There is -- I have a few
16 actually. And let me just march through mine then
17 we'll see who else has.

18 You've basically endorsed Appendix E to
19 12-06, Rev. 2. If you heard some of the discussion
20 that we had with the industry, Appendix E now
21 focuses on confirming the feasibility of personnel
22 actions. It does not address the reliability.

23 However, as Appendix E will be applied
24 as we go toward the focused assessments of now more
25 narrowly-defined seismic and flooding scenarios, if

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1 you will, there are, especially in the flooding area
2 right now the way the guidance is written, the need
3 to demonstrate confidence in both feasibility and
4 reliability for events that are judged to have
5 higher frequencies of occurrence, if you will.

6 How does the staff now develop
7 confidence in the reliability of human performance
8 for implementing those strategies if all I have is a
9 demonstration that they're feasible? It is in fact
10 feasible for me to drive from here to San Francisco
11 within some defined period of time. I might not at
12 all be very reliable by the time I get to the end of
13 it because I might be sleep deprived.

14 So how are you addressing that notion if
15 you're just addressing feasibility without any
16 assessment of uncertainty, without any assessment of
17 how large are the available margins to account for
18 uncertainty or as a surrogate for reliability?

19 MR. BOWMAN: The way we approached the
20 Appendix E in the validation of the actions
21 necessary for the mitigating strategies is it was
22 based on the Order EA 12-049 being an undefined
23 situation that is not amenable for defining what the
24 personnel performance factors would be for human
25 reliability analysis.

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1 So we acknowledged from the get-go that
2 we aren't going to be able to get a good, defensible
3 judgment that a set of actions was reliable for all
4 of the circumstances under which the actions could
5 potentially be required.

6 As a result, Appendix E, we're unwilling
7 to go beyond saying that it will indeed get you a
8 determination that a set of actions is feasible.

9 That being said, though, what you will
10 get is a collection of information in a report that
11 shows the time margins available for all of the
12 constituent tasks and also in Section E.65 of
13 Appendix E requires an integrated review to go
14 through and look at the confidence that there is in
15 the validation, so looking at the overall
16 performability without characterizing it as being
17 something that would be reliable.

18 And given that, and the other outcomes
19 you get with the integrated review are you avoid the
20 circumstance of potential double counting of staff
21 or equipment that could take place just looking at
22 it as a piecemeal individual test where feasible.
23 We wanted to have confidence that the staff, as it
24 exists on the point of time the event is postulated
25 to take place, could perform the actions reasonably,

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1 taking into account things like consequences of sub-
2 optimal performance. If it takes a little bit
3 longer to strip loads off a battery, what's the
4 downstream effect going to be?

5 And anyway, what the industry is
6 developing is technical reports that include the
7 event being submitted but retained on site.
8 Generally there are technical reports on the
9 validation that include the degrees of margin they
10 have to the time necessary to perform the individual
11 actions.

12 In the Flooding Action Plan that was
13 sent to the Commission in COMSECY-15-19 and approved
14 in the SRM we did point to the use of engineering
15 judgment -- and I would term it more broadly
16 engineering and operational judgement -- to take
17 into account the likelihood of a flooding event,
18 recognizing that we don't have a broadly technically
19 acceptable method of determining flooding
20 frequencies of exceedance for all of the flood
21 mechanisms, and balance that with the degree to
22 which a licensee has been able to demonstrate the
23 goodness of their validation of the strategies.

24 And I use the term "goodness" because
25 I'm not willing to use the term "reliable" to

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1 describe what the results are. In my view you
2 either get a feasible determination or you follow
3 something like the NUREG-1852 process and as it was
4 also translated in the integrated assessment
5 guidance that was in JLD-ISG-2012-05, Appendix C,
6 that could get you a reliability determination.

7 I don't believe that the guidance we
8 have out there in Appendix E is suitable for saying
9 that it will indeed satisfy all the requirements to
10 be called reliable. But on the other hand, I don't
11 believe that the hazard that's been demonstrated
12 through the determination of the risk that's
13 postulated by these flooding mechanisms and the
14 events that could happen with the flooding would be
15 sufficiently high or sufficiently certain to warrant
16 a further demonstration of reliability.

17 CHAIR STETKAR: That was a long answer.
18 We'll talk about this more this afternoon when we
19 have a little more time. You may want to rethink
20 your answer.

21 The basic strategy is that for certain
22 events that remain bounded by the current strategy
23 and the design basis I don't need to do anything.
24 For other events that have a relatively higher
25 frequency of occurrence I need to demonstrate

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1 feasibility and reliability. And the NEI guidance
2 when I look at those piece parts hardware has
3 guidance about how to determine that the piece parts
4 hardware are reliable and available, not so much for
5 humans.

6 For the ones that are judged to have
7 lower frequency of occurrence I only need to
8 demonstrate feasibility of the human actions. The
9 same guidance applies for the piece parts hardware.
10 And I'll just stick to that approach. And I will
11 tell you that the staff's endorsement of just saying
12 that something is feasible but implicitly it's
13 reliable doesn't play out with human performance.
14 And we have ample evidence to show that.

15 So we'll talk about it more this
16 afternoon because that's yet another set of guidance
17 that's all part of this stew here. But by endorsing
18 in DG 13-01 verbatim Appendix E, without any
19 statement about how it may or may not apply to
20 developing confidence on the reliability of human
21 performance for those focused strategies, that may
22 be a shortcoming, especially considering that there
23 is published Nuclear Regulatory Commission guidance
24 on how to account for the stuff that's in Appendix E
25 to evaluate some confidence in the reliability of

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1 performance. It's not something that needs to be
2 created out of whole cloth.

3 So we'll discuss that more this
4 afternoon as we focus on those particular flooding
5 points.

6 The staff has endorsed the notion, and
7 we discussed this in the past, that if I have a
8 multi-unit site -- and for simplicity I will say
9 it's a two unit site -- that the N plus 1 strategy
10 of equipment in NEI 12-06 can be satisfied by having
11 two pumps, each of which are big enough to supply
12 all of the cooling water needs for both units, so
13 that I have N is a big pump and plus 1 is another
14 big pump.

15 Okay, we've discussed that philosophy in
16 the past. ACRS lost. Given that, and now looking
17 at how people are doing their assessment, we heard
18 the discussion this morning, can I now get into a
19 situation where because of the focused assessment
20 process people are going to say I'm going to protect
21 this set for flooding, but not seismic. I'm going
22 to protect this set for seismic, but not flooding.
23 Because I don't have to consider seismic and
24 flooding together. And, therefore, I followed all
25 of the rules.

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1 I have N. I've counted N plus 1. I've
2 not had to consider anything else. And yet when we
3 get the event, it's not protected.

4 Again because, remember, the original
5 principle was that FLEX was supposed to be diverse
6 and flexible coping for an undefined event. And
7 we're suddenly now making it, well, it's not diverse
8 and flexible for this particular event, but it's
9 diverse enough and kind of flexible enough for this
10 particular event. And it's differently diverse and
11 differently kind of flexible for this other
12 particular event. And for other things maybe it's
13 kind of diverse and flexible enough. Maybe, but we
14 don't know.

15 MR. BOWMAN: I understand your concerns,
16 and particularly the seismically-induced flooding
17 concern. We talked about it a little bit yesterday.
18 And I wanted to point out to you a couple of things
19 that are in the guidance in NEI 12-06.

20 In Section 3.2.1.3 that sets the initial
21 conditions for the event, Item Number 9 is that "No
22 additional events or failures are assumed to occur
23 immediately prior to or during the event, including
24 security events."

25 And then in the guidance on the reactor

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1 transient, 3.2.1.4, Item Number 4, "No independent
2 failures, other than those causing the ELAP/LUHS" --
3 loss of ultimate heat sink event -- "are assumed to
4 occur in the course of the transient." That allows
5 for consideration of the occurrence of consequential
6 failures.

7 And for the sites for which there is a
8 potential for consequential failures, like an
9 upstream dam failing due to a seismic event causing
10 a flood, the sites that have that have taken it into
11 account.

12 A colleague of mine pointed out two
13 additional sets besides the two I mentioned
14 yesterday. The individuals we've talked to here,
15 it's not a problem for Arizona Public Service.

16 CHAIR STETKAR: No, it's I don't want to
17 --

18 MR. BOWMAN: But the sites where it is a
19 problem, they did look at it, so.

20 CHAIR STETKAR: Eric, my concern is, I
21 mentioned earlier, the ACRS is not in the business
22 of looking at 70-some-odd site-specific analyses and
23 providing comment. That's not what we do. We look
24 at bigger picture stuff.

25 I'm looking at the bigger picture stuff

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1 and saying are there gaps in the bigger picture
2 stuff that people can use to their advantage to say
3 that we complied with NEI guidance that's been given
4 to me as a utility and that, indeed, there's nothing
5 in staff review guidance, regulatory guidance that
6 says I have to do anything more. And, therefore, I
7 satisfy everything. So, therefore, the staff should
8 accept my proposed strategies.

9 That's the level I'm dealing with. You
10 know, I've been using seismic-induced flooding
11 because we've walked ourselves into seismic and
12 flooding and ELAPs and LUHSSs and all of those
13 things. But I'm trying to keep it at a level that
14 says are we inadvertently walking ourselves into a
15 style -- an effective stylized design-basis approach
16 to looking at these things, which was not the
17 original intent of the whole process?

18 And the more that you look at an
19 individual hazard and an individual scenario and say
20 I'm protected against that, but nobody told me that
21 I had to think about something else, the more we
22 depart from that, that basic notion of what the
23 industry proposed as a diverse and flexible
24 strategy.

25 So, again, I'm using seismic-induced

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1 flooding as a surrogate but it's one I can at least
2 point to. And I've heard feedback -- we heard it
3 this morning -- that, no, people don't have to
4 consider that. Now you're saying, well, there might
5 not be any sites that have that particular
6 confluence of things because the dam might be far
7 enough away. Or, the ones that do already think,
8 fine. What's the other thing that they're not
9 thinking about?

10 DR. SCHULTZ: And just to amplify that
11 point, too, John, is that, you know, as we talk
12 about it here, and NEI is here, and staff is talking
13 about how this is going to work, and we may, we may
14 cover everything nicely now but unless the guidance
15 is properly written --

16 CHAIR STETKAR: Yes.

17 DR. SCHULTZ: -- 10 or 15 years from now
18 these holes or opportunities that we talk about in,
19 if you will, the next generation of analysts or
20 decision-makers at the sites, you know, things,
21 things can change --

22 CHAIR STETKAR: If it's not written.

23 DR. SCHULTZ: -- unless it's clearly
24 written as to what we will be accomplishing what we
25 set out to do.

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1 CHAIR STETKAR: Everything sounds good
2 orally. But the staff reviewer who raises the
3 question a year-and-a-half from now about somebody's
4 submitted assessment says, Hey, you didn't consider
5 this. And suddenly the licensee says, Well, I
6 wasn't forced to consider it. And, you know, 600
7 RAIs get written and it marches up the management
8 chains. It's counterproductive.

9 MR. REED: I would just, I by the way
10 completely agree with what you're saying. In fact,
11 what we're trying to achieve in the final rule is
12 crystal clear requirements for the crystal clear
13 supporting section by section saying what they mean
14 and intend and what the guidance is. Okay. So it's
15 all clear 10 years down the road an inspector,
16 anybody else comes along, they know exactly what
17 they mean.

18 And that's the exact objective we're
19 shooting for. That's what you try to do. So we're
20 trying to shoot for that goal. So I'm agreeing with
21 the principles.

22 CHAIR STETKAR: You know, I heard what
23 you read, the excerpts from the 12-06. One oral
24 interpretation of those excerpts is the way you
25 characterized it, that they don't exclude

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1 consequential events.

2 Another oral interpretation is, no,
3 those are independent, seismic and flooding is
4 independent.

5 The staff, you know, the staff can
6 quickly elaborate, you know, in their guidance about
7 you do have to consider consequential events.

8 MR. REED: Okay.

9 CHAIR STETKAR: It doesn't take a lot or
10 wording. It's not our business to write draft
11 regulatory guidance either. We're just, it's a
12 subcommittee meeting. These are individual
13 comments. It isn't an ACRS position. Have to say
14 that on the record.

15 MR. REED: Okay.

16 CHAIR STETKAR: Another comment. Take a
17 look at -- and this is just a, I think and I hope
18 it's just a typo -- take a look at your Section
19 6.1.2 where you're talking about alternate
20 mitigating strategies, in particular this is under
21 seismic events, and it looks like you copied words
22 from flooding that didn't -- don't necessarily apply
23 to seismic because you talk about exhaustion of fuel
24 for operating emergency power sources.

25 And I get why that applies if I'm

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1 flooding underground fuel storage --

2 MR. BOWMAN: Is that in the draft
3 guidance?

4 CHAIR STETKAR: It's in DG 13-01, the
5 one that's there.

6 MR. BOWMAN: That wording has been
7 removed from the JLD-ISG which is a more current
8 version of the wording.

9 CHAIR STETKAR: Okay.

10 MR. BOWMAN: It's been adjusted.

11 CHAIR STETKAR: Okay.

12 MR. BOWMAN: Granted it's a moving
13 target.

14 CHAIR STETKAR: Okay. Just the only
15 reason I brought it up is if there was something
16 subtle that I was missing in terms of the intent, I
17 wanted to kind of dredge that up. But if it's
18 wording, that's fine.

19 Let's talk about -- I don't want to talk
20 about Appendix H.5, or Path 5, unless any of the
21 members want to talk about that. And it's, we can
22 because there is just stuff written in DG 13-01 on
23 it.

24 I'll let the industry off the hook a
25 little bit on the IPEEE models which are not Path 5,

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1 they're Path 3, because they said, Well, the staff
2 has approved all that.

3 So let's talk about staff approval. So,
4 Path 3 says I can take my IPEEE models and do some
5 sort of comparison and figure out that I'm okay.
6 Educate me on what those approved IPEEE models are.
7 The staff said, well, they're -- or, I'm sorry, the
8 industry said there are seven or eight sites that
9 are eligible to use this approach. So the
10 eligibility must have been determined by some staff
11 acceptance.

12 What does that acceptance mean? And in
13 particular I'm looking at the technical scope level
14 of detail of the IPEEE models; how those models
15 accurately represent the currently as-built, as-
16 maintained, as-operated plant compared to what it
17 looked like in the late 1980s. And --

18 MR. BOWMAN: Okay, so --

19 CHAIR STETKAR: And how seismic failures
20 were treated in those models, in particular to
21 develop the so-called plant-level HCLPF. Does that
22 only account for seismic failures that result in
23 core damage? Or does it also include any core
24 combination of seismic/non-seismic human errors that
25 contribute to core damage?

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1 MR. BOWMAN: I'm going to phone a friend
2 on this answer to this. I've got on the line Mo
3 Shams.

4 But one thing I did want to point out,
5 for the number of plants and the identification of
6 the individual plants that are eligible for Path 3
7 or Path 4 in Appendix H, in the ISG we've listed
8 specifically which plants are eligible for which of
9 the individual Paths. So --

10 CHAIR STETKAR: Good. And, again, we're
11 ACRS, we don't get into looking at --

12 MR. BOWMAN: Oh, I understand.

13 CHAIR STETKAR: -- that level of detail.

14 MR. BOWMAN: But that gives you the
15 numbers for which ones they are.

16 CHAIR STETKAR: Fine.

17 MR. SHAMS: So this is Mohamed Shams
18 with the staff.

19 So as part of the 5054(f) letter
20 regarding the reevaluation of the seismic hazard at
21 the sites, the staff looked at what sites have done
22 in the past. And IPEEE was one of the major studies
23 that the industry had forwarded as that's work that
24 demonstrated margin in the facilities. And they
25 indicated that they would like to leverage, you

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1 know, that work.

2 So in developing the guidance for how we
3 would carry forward the reevaluated hazard or how we
4 would screen sites for further risk evaluation, we
5 took advantage of those sites that did a full scope
6 IPEEE.

7 There were a number of scopes for the
8 IPEEE. Some sites looked at more reduced scopes.
9 Some sites have done a -- without perhaps, you know,
10 solar evaluations or, you know, other aspects of the
11 evaluation.

12 So in developing the guidance we said
13 that those that have done full scope IPEEE, which
14 included two shutdown Paths and other relevant
15 failure modes, as you indicated in the question, did
16 we take human factors, that was part of the
17 consideration when a licensee described their
18 response to the hazard.

19 So to the main, the main aspect to say
20 is everybody had submitted an IPEEE, but not all
21 were of the right scope or the right pedigree that
22 had been accepted for this test. That's the reason
23 that only seven or eight or a handful was accepted.

24 In terms of what was missing, the
25 question alluded to what was the pedigree or what

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1 was missing and how are we treating that today, we
2 also augmented our approval of the IPEEE with a
3 couple of other aspects. If there was exceedance in
4 the high frequency range we know that has not been
5 looked at and we required the licensee to further
6 look into the plant response in that area.

7 Another area that we also had indicated
8 as an area to augment what was done for the IPEEE is
9 the spent fuel pool area as well. So if there was
10 an exceedance in the range important to the spent
11 fuel pools we had them look at that as well.

12 Again that, you know, that -- I'll just
13 pause here and --

14 CHAIR STETKAR: Okay. When, just for
15 the record, were the IPEEEs submitted? Just
16 ballpark time.

17 MR. SHAMS: Ballpark time, it was in the
18 late '90s, early 2000.

19 CHAIR STETKAR: Okay. So they reflect,
20 ostensibly, the configuration of a plant something
21 on the order of 20 years ago.

22 MR. SHAMS: It is fair to say that. But
23 I should add that part of the submittal of the IPEEE
24 this time around had -- I'm sorry, I shouldn't say
25 that. I should say part of the approval for the

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1 IPEEE this time around is to have confirmed that any
2 vulnerabilities that were identified at the time,
3 any fixes that needed to be done were also
4 considered and implemented. Had a licensee
5 significantly changed the configuration of the plant
6 in a meaningful way, I would venture that the IPEEE
7 at this point would certainly not be appropriately -
8 -

9 CHAIR STETKAR: But, see, I hear those
10 words aurally in this environment. I'm asking you
11 what specific efforts did the staff make to confirm
12 that whatever was being presented to the staff now
13 in 2016 or '15 or whenever it was, for '14, I don't
14 care --

15 MR. SHAMS: Right.

16 CHAIR STETKAR: -- whenever it was
17 presented accurately represents the current plant
18 and could be used to evaluate the current plant
19 vulnerabilities to the seismic events that are
20 currently being evaluated for that plant, not the
21 seismic events that were evaluated in the middle
22 '90s to the plant that existed in the middle '90s,
23 for the purposes of those assessments which were a
24 course assessment to identify seismic
25 vulnerabilities and not necessarily seismically-

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1 induced events that could be important to plant
2 safety? It's a different focus.

3 So I'm asking you now what efforts did
4 the staff make to have confidence that those things
5 that are being proposed are reasonable to use today?

6 MR. SHAMS: I would say two parts: one
7 that I offered already that we've required that
8 licensees identify or confirm that licensees have
9 addressed the vulnerabilities that were identified.
10 That was one piece.

11 The second piece --

12 CHAIR STETKAR: Well, let me interject
13 here.

14 MR. SHAMS: Right.

15 CHAIR STETKAR: Twenty years ago I had
16 an old beater Toyota.

17 MR. SHAMS: Right.

18 CHAIR STETKAR: I used to replace its
19 water pump. I did that. It was good.

20 You know, I don't have that car anymore.

21 MR. SHAMS: Right.

22 CHAIR STETKAR: I don't have that issue.
23 So, fine, they fixed that. But it may not be
24 applicable anymore.

25 MR. SHAMS: Okay. Allow me. The second

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1 piece is coming.

2 CHAIR STETKAR: Yes, okay.

3 MR. SHAMS: Early on in Fukushima the
4 staff did a walk-down to confirm that the licensees
5 continued to have the appropriate arrangement and
6 appropriate configuration to meet the current
7 licensing basis. So the point is only a couple
8 years ago it was confirmed that the plant meets its
9 current licensing basis.

10 So what the IPEEE offers is a margin
11 based on meeting that current licensing basis. And
12 that's the idea is if we walk the plant we make sure
13 that they don't have two over one issues, we make
14 sure they have no degraded features in there. And
15 whatever vulnerability that was identified was taken
16 care of. So we established the baseline. And then
17 from there the math gets us to the margin.

18 That's the point I wanted to get to.

19 CHAIR STETKAR: Okay, that one helps.

20 When plants submitted an IPEEE, and as a
21 surrogate they submitted a plant-level HCLPF.

22 MR. SHAMS: Yes.

23 CHAIR STETKAR: High Confidence of Low
24 Probability of Failure, for the record. Just I use
25 acronyms.

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1 Did that value that's now being used as
2 a basis for determining margin account only for
3 seismic failures that resulted in core damage?

4 So, for example, a seismic event
5 destroys offsite power and destroys the diesel
6 generators and, and the batteries let's say. That's
7 a seismic event that will lead to core damage
8 directly, if nothing else.

9 Or, did those HCLPF capacities count as
10 a surrogate somehow -- and I don't know how they
11 would -- for the fact that a seismically-induced
12 loss of offsite power could involve independent
13 failures of the diesels, independent failures of
14 human actions, and eventually result in core damage,
15 but that's not seismically-induced core damage, it's
16 something that resulted from a seismic initiating
17 event?

18 The margin that you calculate is much
19 different given the two because the things that are
20 direct seismic contributors to core damage tend to
21 be really, really bad earthquake events. And our
22 results of full scope risk assessments have shown
23 that most of the risk doesn't come from really,
24 really, really infrequent, very bad earthquake
25 events, it comes from kind of more frequent,

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1 moderate acceleration with combinations of things.

2 So do you know whether those HCLPF
3 capacities that were reported in the IPEEEs
4 accounted for the full scope or just seismic
5 failures?

6 MR. SHAMS: In a yes or no answer I
7 would say, yes, it did account. To what rigor,
8 obviously I don't have the full view of that.

9 But I could offer just so the way the
10 IPEEE was carried out is the licensees -- it will
11 take just 10 seconds -- the licensees had identified
12 a success Path. And the HCLPF represented the
13 minimum, if you would, failure capacity at a plant
14 level for that Path.

15 Part of the staff review went into the
16 actions. And there are some licensees -- that human
17 actions associated and other activities -- and there
18 are some licensees in exchange with the staff were
19 told that there is too much reliance on human action
20 in that response, this is not particularly
21 appropriate. So I'm going to just elaborate on my
22 point that there was a degree of review of the human
23 actions in an exchange between the staff and the
24 licensees on that.

25 CHAIR STETKAR: Okay. Let me, let me --

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1 I have another constraint here. And what I'd like
2 to do is I don't want to end the conversation
3 because there may be other comments, but Ed Lyman we
4 have a time slot. He has a time constraint. And I
5 want to make sure Ed has enough time because of his
6 time constraints to actually make the comments that
7 he wanted to do.

8 So with the agreement of the
9 subcommittee what I'd like to do is put a stop to
10 this discussion and make sure we get Ed's comments
11 on the record. And then we'll come back, finish up
12 this discussion and then I'll ask for more public
13 comments. I'm sorry, I just have to deal with the
14 times.

15 So, Ed, I understand you have some
16 comments that you wanted to present to the
17 subcommittee. And do so.

18 MR. LYMAN: Okay, so I have five
19 minutes; right? So --

20 CHAIR STETKAR: Take as long as you want
21 or need.

22 MR. LYMAN: Well, I'm not really
23 prepared to, I didn't prepare any slides today. But
24 and we do have, UCS did submit some written comments
25 on the draft rule. These don't really embody all

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1 our criticisms of the rule based on our own resource
2 and time constraints. And so I'm not going to
3 really go over these in detail since you can read
4 them.

5 But I would say that the big picture is
6 that we have -- this rule gives the opportunity to
7 fix some of the problems that have arisen in the
8 starting with the mitigating strategies order and
9 the various iterations of the guidance to meet that
10 order. In our view that fundamental, that initial
11 cut dealing with the Fukushima problem as embodied
12 by the mitigating strategies order has serious
13 inconsistencies. And the process seems to be hollow
14 at the core.

15 And I think the discussion this morning
16 really illustrates that. I think the core issue is
17 the sum total of everything that has been done to
18 address the essential issue of beyond-design-basis
19 events that can cause a loss of alternating current
20 power is the sum total of all that that's been done,
21 does it add up to more than zero?

22 And in our view it's really not clear at
23 this point that it does because of the stylized
24 artificial nature of the initial event, which I
25 think is a cause of a lot of the problem and

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1 confusion that has persisted for the last five
2 years. And these issues are not new; we've been
3 talking about them for a long time. And they don't
4 seem to really get closer to resolution.

5 So the one thing I would point out from
6 our comments is that the draft rule even gets, it
7 gets even worse than the mitigating strategies
8 order. It's not just a codification but it's making
9 things more vague. And so this reliance on a
10 performance-based standard that backs away from even
11 a 3-phase structure of the -- that was recommended
12 by the Near Term Task Force and implemented in the
13 order, the fact that we no longer have a defined 3-
14 phase structure I think makes things even more
15 confusing.

16 And we think that that retreat gives way
17 too much latitude to the licensees. That there
18 should be at least a well-defined minimum duration
19 for Phase 1 and Phase 2 so that the public can
20 understand what the licensees are capable and
21 committed to doing. Because it's common sense that
22 if they're going to have portable and other
23 equipment that's going to be part of the FLEX
24 strategy, that they need to know how long they have
25 to be able to set up that equipment and install it

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1 and have it become operable.

2 And there should be a well-defined
3 minimum time that every licensee will have to adhere
4 to. And that's something I think the public can
5 understand. And retreating from that just I think
6 was a big mistake.

7 I haven't reviewed all the tricks,
8 plans, but the ones I've looked, I haven't seen
9 anywhere the Phase 1 duration approaches the 8 hours
10 that the Near Term Task Force originally specified
11 in its recommendation. And without having at least
12 something like an 8-hour margin, we actually
13 recommend a much longer one. We think based on the
14 Fukushima experience that you should have 24 hours
15 of you should be able to cope with an installed
16 system for 24 hours because it took them nearly that
17 much time to establish reliable injection, emergency
18 injection.

19 But even 8 hours I haven't seen a single
20 plan that actually complies with that. And then you
21 are running into the issue of what is adequate
22 margin and does what they're doing to provide
23 adequate margin. And adequate margin is also not
24 defined.

25 So, so again this performance-based

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1 standard, backing away from any kind of prescriptive
2 requirements just I think makes it much harder to
3 understand what's going on.

4 And to deal with the issue of this
5 amorphous event where you don't understand what
6 causes it, it could be anything, but it causes this
7 extended loss of A/C power, that you don't have to
8 consider how that happened, and to carry through the
9 events that caused that in any consistent way makes
10 this exercise, again, very confusing. And so we've
11 recommended here, here before and before the
12 Commission that the way to solve this problem or to
13 address it is to have a scenario-based, you know,
14 stress test approach to the system where you can't,
15 you know, you can't protect against everything but
16 at least if this notion is predicated to FLEX and
17 protect against almost anything that you throw at
18 it, then you have a tool to, inspector should have a
19 kit of scenarios where they can evaluate what is
20 presented to them and play those out.

21 So if it's a seismically-induced
22 flooding event, then you consider the impact of the
23 earthquake on the site. Whatever happens you do it
24 like a PRA where each step you'll decide based on
25 the conditions, what you have and what you don't

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1 have, and you do it logically and systematically.
2 And you do that for a variety of scenarios that may
3 be chosen at random from a larger set. And that
4 would provide at least some measure of confidence
5 that I don't think the process has now.

6 And so without the draft, without the
7 rule having some sort of validation process based on
8 something like that, we think it misses the
9 opportunity to really address the issue, of
10 addressing the Fukushima lessons learned
11 appropriately, so.

12 MEMBER POWERS: Ed, you said the words
13 "don't really know what caused it or where, what it
14 is." You're speaking of an advance. I don't know -
15 - When it actually occurs I'd pretty well know.

16 MR. LYMAN: But even if you -- well, no,
17 I'm talking about the mitigating strategies order
18 which says that some unspecified beyond-design-basis
19 event causes an ELAP and a loss of heat sink. But
20 that undefined event does not have to be propagated
21 through, so you don't have to consider, well, what
22 caused it? Was it a flooding event that caused the,
23 you know, short circuit? Or was it -- you know, you
24 don't have to specify that event. And then have a
25 consistent scenario where you look at all the

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1 impacts of that event.

2 So, and so that allowed the industry to
3 come up with the guidance that said we can consider
4 everything else to be design-basis essentially;
5 right? We don't have to, even if it is a beyond-
6 design-basis external event, the only impact it had
7 was to cause the extended loss of A/C power and the
8 loss of heat sink, but it would have no other
9 impacts at the site that were beyond-design-basis.
10 That's what the lack of specificity or the confusion
11 in that original order led to.

12 So it allows these, these inconsistent
13 scenarios to play out where you don't have to
14 consider -- you don't have to consider simultaneous
15 events like seismic and flooding, even though that
16 may have been a logical origin for your problem.
17 And so we're just saying you should play out, you
18 know, you should have a set of scenarios and you
19 should just play out exactly the damage states that
20 they will cause. And you look at all the equipment,
21 all the human performance issues, and you do that
22 consistently. And that's the only way to get an
23 answer to say is this feasible and is it reliable?

24 So that's the basic point.

25 CHAIR STETKAR: Any other comments or

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1 questions for Ed?

2 (No response.)

3 CHAIR STETKAR: Ed, thanks a lot.
4 Appreciate it. And hope you make your appointment.

5 MR. LYMAN: Not too bad.

6 CHAIR STETKAR: Thank you very much.

7 And we'll go back now to making the
8 staff's lives as collectively uncomfortable as we
9 can.

10 I don't have any more comments on DG 13-
11 01, with the caveat that I'm not going to try to
12 talk about Path 5 today because we're going to have
13 the opportunity to discuss that with NEI in terms of
14 their guidance. So I'm just leaving that on the
15 table until we revisit it because I don't know what
16 they're going to come up with there.

17 MEMBER POWERS: I did not -- the earlier
18 presentation, there was kind of an abbreviated
19 mention of human reliability --

20 CHAIR STETKAR: Yeah.

21 MEMBER POWERS: -- and challenges there.
22 And I didn't follow the argument that was being made
23 at all. Maybe we could reproduce it.

24 CHAIR STETKAR: And because Dennis
25 wasn't here, and I hate to do this but because he's

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1 kind of interested in this stuff.

2 What I asked the staff is that they've
3 endorsed a certain number of plants for which the
4 IPEEE can be used in this process for a so-called
5 Path 3 evaluation of seismic events. And what I was
6 challenging them is how well those IPEEE submittals
7 first of all account for the currently operated
8 plant. And, in particular, let's presume that it
9 does, there's an awful lot of discussion in the
10 guidance about using the IPEEE-generated plant-level
11 HCLPF capacity, High-Confidence of Low Probability
12 of Failure, as a measure of margin against the
13 reevaluated seismic hazard.

14 Now, I get that concept. But it's
15 really important to understand what that HCLPF
16 capacity accounts for. Because if it only accounts
17 for seismic events that are strong enough by
18 themselves to directly cause core damage, that, that
19 is one value.

20 If it accounts for a surrogate capacity
21 for the conditional core damage probability from any
22 seismic event, that's a much different value, if it
23 accounts for, somehow, hardware failures and, in
24 particular, human actions.

25 So that's how we got into that

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1 discussion.

2 MEMBER BLEY: I heard a little bit of
3 that.

4 CHAIR STETKAR: You did. Okay.

5 MEMBER BLEY: Only the hardware part.

6 CHAIR STETKAR: And Dana's right, the
7 discussion of human was not well-elaborated. So
8 let's ask Mo again now about the human side of that.

9 MR. SHAMS: Sure.

10 So in response, I, looking back at the
11 HCLPF what it represents. So as I mentioned, each
12 licensee selected a success path essentially, a path
13 to be able to shut down the reactor safely, and
14 developed a seismic margin, a minimum seismic margin
15 for that, for that path. And that represented a
16 seismic event that the plant, there is a reasonable
17 level of confidence that the plant would survive.

18 MEMBER BLEY: That's better than
19 reasonable. But go ahead.

20 MR. SHAMS: Thank you.

21 And in terms of the human actions
22 associated with that, I responded that the staff did
23 look at the degree at which licensees are relying on
24 human actions in carrying out that success path.
25 And there were comments, there were feedback

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1 provided when there were too many of them or
2 unreasonable level of reliance on human action. So
3 to that degree I responded back that the human
4 actions were, were considered and were addressed in,
5 you know, in the staff's evaluation of what the
6 licensees have done for the IPEEE.

7 And I put all that in a final package,
8 if you would, that only very few that we're allowing
9 to use the IPEEE, those that we have confidence in
10 their overall approach, the math associated with the
11 HCLPF calculations as well as the human path actions
12 used also the scope, the overall scope of the study
13 itself was the appropriate one. I mentioned earlier
14 there were a number of scopes, licensees selected,
15 full scope versus other reduced scopes.

16 So, so that's how I responded to the
17 question.

18 MEMBER RAY: John or Dennis, I guess I
19 thought we were talking about the seismic
20 reevaluation associated with mitigating FLEX
21 equipment, not the plant itself. But when I hear
22 John talk just now and asking the question that was
23 just responded to, it sounds like we're talking
24 about the plant.

25 Help me understand what.

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1 CHAIR STETKAR: We'll ask the staff.
2 That's one of the questions that I had is now people
3 seem to be retrenching and saying, Ah, even if I
4 didn't have FLEX at all, I flushed FLEX down the
5 drain, my plant as I evaluated it under IPEEE could
6 have coped with the reevaluated seismic hazard, so I
7 don't need to go look to even see whether FLEX will
8 survive.

9 MEMBER RAY: And it was because of that
10 that I stumbled around earlier trying to figure out
11 are we trying to ask any questions we have about
12 that now?

13 CHAIR STETKAR: Yes, absolutely.

14 MEMBER RAY: Because I didn't anticipate
15 that. And so I'm not ready to.

16 But in other words, I'm not thinking --
17 I thought we were focused, like I say, on FLEX
18 equipment and its ability to withstand the increased
19 seismic event.

20 MEMBER RICCARDELLA: Equipment
21 management strategy.

22 CHAIR STETKAR: Let's first of all
23 because Dana brought up the itch about human
24 performance, did it get scratched well enough for
25 you? Because we're going to diverge here away from

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1 that topic a bit.

2 MEMBER POWERS: Well, my note said that
3 they had troubles analyzing human reliability in
4 these extreme circumstances and whatnot. And when
5 I, the trouble with being old is I go back to Alan
6 Swain when he was setting up the Human Reliability
7 Handbook, and his whole objective was, gee, under
8 stress circumstances how well do people perform?
9 And so he seemed to be specifically addressing the
10 chaotic circumstance in his thinking. And so I
11 said, gee, that's what Alan Swain was trying to do.

12 And it's true that you probably can't do
13 it very well, but you can do something.

14 MEMBER BLEY: Well, I came in late on
15 this. Are we talking about the effect at the HCLPF
16 or the effect of the earthquake that really does
17 damage?

18 MEMBER POWERS: I got the impression --

19 MEMBER BLEY: Because if it's a HCLPF
20 it's no big deal. It's not this --

21 MEMBER POWERS: I got the impression
22 that what they were, what they were looking at was
23 what is the reliability of bringing the FLEX
24 equipment on board and bridging the gap between the
25 time you have and don't have the flexibility.

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1 CHAIR STETKAR: That gets, that starts
2 to get into though what Harold thought up, and I'll
3 try to elaborate a little bit more. Let me ask this
4 first, then we can come back to human performance
5 then.

6 It's my impression, and I might be wrong
7 so I want help on this, it's my impression that a
8 so-called Path 3 evaluation where people are going
9 to use the IPEEE is answering the question can the
10 plant adequately -- can the plant demonstrate that
11 it can maintain adequate safety, given the
12 reevaluated seismic hazard, with no consideration
13 whatsoever of FLEX?

14 MR. BOWMAN: That pretty much is what it
15 is.

16 CHAIR STETKAR: Okay.

17 MR. BOWMAN: Similar to the flooding
18 area, what is termed the ultimate mitigating
19 strategies is a demonstration that there is a
20 ability for the plant to achieve a safe and stable
21 state, whether it's with the FLEX equipment or with
22 the plant equipment --

23 CHAIR STETKAR: Okay.

24 MR. BOWMAN: -- without considering the
25 existence of an ELAP, unless the ELAP is caused by

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1 the event.

2 CHAIR STETKAR: The difference though,
3 as I read it -- and this is interpretation, personal
4 interpretation -- is when I look at the guidance for
5 flooding for ultimate mitigating strategies, that
6 guidance doesn't say using only plant equipment or
7 using only FLEX equipment, it says reevaluate
8 everything. And if part of that alternate
9 mitigating strategy is that I have to go haul my
10 FLEX pump up on the plateau, that's fine. That's an
11 alternate mitigating strategy for that particular
12 flooding mechanism.

13 When I go to seismic, in particular to
14 Path 3 because it only relies on IPEEE -- and don't,
15 I know the spent fuel pool, I know the high
16 frequency -- but it relies now on only in-plant
17 equipment. I can dynamite the FLEX equipment and
18 still pass a Path 3 evaluation. Is that correct?

19 MR. BOWMAN: It may be. However, there
20 may be a need for some of the FLEX equipment for
21 doing things like the refueling the emergency diesel
22 generators or things like that.

23 MEMBER RAY: But is that then the end of
24 the subject of evaluating the plant's ability to --
25 I mean it's essentially changing the design basis it

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1 seems to me is what happens when you end with that.
2 Now, to say we don't need the FLEX equipment, that's
3 one thing. To say -- and that's fine. And we don't
4 need to do anything more. That's really what I'm
5 asking.

6 MR. SHAMS: Perhaps if I may, I don't
7 think that Path 3 is saying that we don't need FLEX
8 equipment. I believe that Path 3, as Eric indicated
9 -- and I'll just back up for just a second here to
10 describe a little bit more philosophy.

11 So mitigating strategies are already
12 designed and many -- when I say mitigating
13 strategies I say FLEX equipment, are already
14 designed and installed for the great majority of the
15 sites. So the exercise with looking at the impact
16 of the reevaluated hazard on this is essentially one
17 of is a modification warranted? And looking at a
18 number of options, flood --

19 MEMBER RAY: Excuse me for interrupting.
20 But is a modification required in the FLEX
21 equipment?

22 MR. SHAMS: Correct.

23 MEMBER RAY: And that's all?

24 MR. SHAMS: For the plant equipment for
25 that --

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1 MEMBER RAY: Well, all right. And
2 that's the addition of order in the plant equipment
3 is what I'm hung up over. So let's just, I'll stop
4 there.

5 MR. SHAMS: But the first phase of FLEX
6 is plant equipment. So we're looking at an entire
7 package that's three phases, part of which is plant
8 equipment, part of which is portable. So the
9 exercise, again, is to assess whether or not a
10 modification is warranted.

11 And Path 3 is one that says if I can
12 demonstrate that the plant equipment can survive
13 indefinitely, I don't particularly need to examine
14 the need to modify the FLEX, the portable FLEX.

15 MEMBER RICCARDELLA: To me there's a
16 huge different between Path 3 and the other four,
17 the other four paths. Because we got into this
18 because the FLEX equipment is designed to SSE, and
19 the other four Paths also. Well, what do I do if
20 that SSE assumption isn't right? And, you know,
21 that all makes sense. But the plant equipment --
22 the FLEX equipment wasn't designed for the IPEEE
23 spectrum.

24 So now we're going with this, I guess
25 what you call this alternating, this alternate

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1 mitigating strategy that says, well, I don't -- I
2 agree with John -- it says, well, I don't need the
3 FLEX equipment. Or if I do, I'm going to go back
4 and re-qualify that FLEX equipment that I need to a
5 higher spectrum.

6 MR. SHAMS: If I may respond. So the
7 first phase of FLEX is plant equipment. And it was
8 designed to SSE. And what Path 3 provides or the
9 IPEEE provides the inherent margin in that phase 1
10 FLEX.

11 MEMBER RICCARDELLA: Right.

12 MR. SHAMS: And it says that it actually
13 has the capacity to address the reevaluated hazard.

14 MEMBER RICCARDELLA: Okay.

15 MR. SHAMS: And then the caveat we've
16 added in addition to that is actually can the plant
17 go indefinitely on that phase alone. And that's the
18 ultimate outcome of Path 3. It should be able to --
19 and you'll see some caveats related to spent fuel
20 pool about ensuring that there's a portable pump or
21 whatnot stored properly to be able to withstand that
22 hazard, so.

23 MEMBER RICCARDELLA: And what's the
24 nexus between that Path 3 evaluation and the 2.1
25 evaluations that are ongoing? I mean aren't they

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1 doing largely the same thing? The 2.1 evaluation
2 should qualify all that plant equipment.

3 MR. SHAMS: It's essentially for the
4 same plant that would be the same evaluation.
5 Because, you know, for the 2.1 evaluation after the
6 hazard was addressed the question became do I need
7 to do a risk assessment? And given the inherent
8 margin in the plant equipment the answer becomes no.
9 And that closes that aspect.

10 And then just to answer the question for
11 how about the mitigating strategies, are they
12 adequate, appropriate or can be implemented for the
13 reevaluated hazard? The same logic now if we can
14 use the capacity and demonstrate that phase 1 is
15 capable, then that answers the question as well.

16 MEMBER RICCARDELLA: Is IPEEE one of the
17 paths being used in the 2.1 evaluation?

18 MR. SHAMS: It is. It is a --

19 MEMBER RICCARDELLA: Presumably it's the
20 same plant.

21 MR. SHAMS: Absolutely.

22 MEMBER RICCARDELLA: The same three or
23 four plants.

24 MR. SHAMS: For the same few plants,
25 yeah.

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1 MR. BOWMAN: If it helps, we did not
2 willy-nilly require all the licensees to do all the
3 same things for all the same hazards because we
4 recognized that there's a site-specific element to
5 the hazards that are applicable to a site. And in
6 NEI 12-06 when it came in originally there's an
7 appendix, Appendix B, that has a discussion about
8 screening out of different hazards for the different
9 sites were it to take place, based in large part on
10 what the site-specific nature of the hazard at that
11 site was.

12 That's why we don't have guys running
13 around with flight jackets on at Palo Verde, just as
14 a fairly facetious example. And we are not
15 concerned about snow plows at Turkey Point.

16 On the other hand, in NEI 12-06 we made
17 the seismic hazard applicable to all sites. This is
18 effectively extending a screening process, if you
19 will, similar to the Appendix B screening process,
20 to see do we need to do something more for the FLEX
21 mitigating strategies that were developed under EA-
22 12-049 using NEI 12-06 for licensees that have
23 sufficient IPEEE HCLPF capacity that they can
24 demonstrate they've got a safe shutdown path or two
25 safe shutdown paths that would last for a

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1 sufficiently long time.

2 MR. TSCHLITZ: So this is Mike Tschlitz
3 from NEI.

4 I would just like to provide a little
5 perspective from the industry because I was involved
6 with developing the five paths in the NEI guidance
7 document.

8 And I would say that I think the part
9 that I think is misunderstood here is that even
10 though Path 3 doesn't go through the rigorous
11 analysis of the FLEX equipment, I would offer the
12 fact that since the existing phase 1 equipment is
13 primarily installed plant equipment, and that is
14 going to have to be relied upon in the IPEEE, and
15 your IPEEE showed that for a seismic hazard that's
16 greater than the reevaluated hazard, the plant has
17 adequate capacity to withstand that and remain
18 operable. So beyond that you also have phase 2 and
19 phase 3 FLEX equipment. And I think the presumption
20 in NEI 12-06 is after 24 hours you can bring in
21 offsite resources to bear.

22 So the question became was it really
23 warranted to perform a rigorous, detailed analysis
24 when you had shown all this capacity, and still the
25 capacity to bring in offsite equipment from the

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1 national response centers with the likelihood that
2 the outside equipment would still be there and
3 available, so what degree do you have to prove this
4 to have assurance?

5 And I think the staff was responsible
6 and the decision was made is, you know, we don't
7 need to dedicate a lot of resources to this because
8 there's a lot of success paths here. And the IPEEE
9 already showed that the plant design was robust.

10 So I would say don't over-discount the
11 capability of FLEX, even though it's not
12 specifically analyzed for Path 3.

13 MEMBER RICCARDELLA: But so you're
14 saying all you would discount is the phase 2
15 approach because that's not qualified for the IPEEE
16 seismic; right?

17 MR. TSCHLITZ: No, I wouldn't --

18 MEMBER RICCARDELLA: You'd still have
19 the phase -- you'd have the phase 1 and the phase 3
20 but not the phase 2.

21 MR. TSCHLITZ: I would not necessarily
22 discount any of it. I would just say --

23 MEMBER RICCARDELLA: Well.

24 MR. TSCHLITZ: -- the fact that it
25 hasn't been analyzed down to, you know, developing

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1 first for the FLEX storage structure and spending
2 millions of dollars doing an analysis of whether
3 that survives a new hazard, is that really money
4 well spent as far as safety benefits?

5 MEMBER RICCARDELLA: I'm not being
6 critical, I'm just trying to understand.

7 CHAIR STETKAR: Well but, Mike, you had
8 to spend millions, you had to spend millions of
9 dollars to provide some assurance that it is robust,
10 whatever that means, based on the existing safe
11 shutdown earthquake. So are you saying is that the
12 industry gambled and said it was good enough for the
13 current design basis and you decided not to
14 reevaluate it for the reevaluated hazard?

15 That was the risk that you took in terms
16 of saying all that has to be done is protect it
17 against the design basis. We, ACRS alerted both the
18 industry and the staff that maybe that was pretty
19 shortsighted, and it's now coming to the point where
20 we're saying that maybe it was pretty shortsighted.

21 MEMBER RAY: Let's try Path, let's try
22 Path 4 for just a minute because Path 3 is, I got
23 this set of assumption that maybe are fine. But
24 with NEI at the microphone here, because I didn't
25 want to have to ask the staff a question about NEI

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1 slides. So do I still have -- can't see around the
2 corner.

3 MR. TSCHLITZ: Behind you with the
4 microphone.

5 MEMBER RAY: Okay, I'm sorry.

6 On Path 4, for example, the thing that
7 really triggered my thought process here originally,
8 got me off on what may be a wrong track is, is a
9 statement that it relies upon -- GMRS exceeds and so
10 on -- but it relies upon, the Path does, qualitative
11 assessment of certain SSEs based on seismic
12 experience.

13 What does that mean?

14 MR. TSCHLITZ: I would offer that Greg
15 Hardy and John Richards are the right people to ask
16 that question.

17 MEMBER RAY: And I'm sorry I didn't ask
18 it at the time.

19 MR. TSCHLITZ: Right, right.

20 MEMBER RAY: But I've got to ask it now.

21 MR. TSCHLITZ: They're the ones that
22 developed the basis for that statement in there and
23 they can provide the defense of the statement in the
24 document.

25 MEMBER RICCARDELLA: But could we be

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1 clear that under Path 4 that's really only applied
2 to FLEX equipment; right?

3 CHAIR STETKAR: No. It's, no, Path 4 is
4 the whole enchilada.

5 MEMBER RAY: See that's what he had been
6 talking, Path 4 or Path 3?

7 CHAIR STETKAR: Path 4.

8 MEMBER RICCARDELLA: It says if you
9 exceed your SSE then these are the things you're
10 going to do, as long as it doesn't exceed it by more
11 than a factor of two.

12 CHAIR STETKAR: That's right.

13 MEMBER RICCARDELLA: But all these
14 Paths, they really only refer to FLEX equipment and
15 strategies because we're doing an alternate
16 evaluation under 2.1 of everything in the plant for
17 plants that exceed SSE; right?

18 CHAIR STETKAR: Path 4 includes the
19 phase 1 FLEX response which is the response with the
20 installed equipment.

21 MEMBER RICCARDELLA: But isn't that also
22 --

23 (Simultaneous conversation.)

24 MEMBER RICCARDELLA: So this is also
25 covered by the 2.1?

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1 CHAIR STETKAR: Yes.

2 MEMBER RICCARDELLA: See, so it's, I
3 mean the evaluation of the whole plant and all the
4 equipment is being done under this other --

5 MR. SHAMS: Yeah, if I may, let me try
6 to clarify a little bit about Path 4.

7 So again, you know, so strategies are
8 designed and installed for most plants. And now we
9 just have to exercise if we have a new hazard or a
10 higher hazard, what do we do with that to make sure
11 that those three phases are appropriately
12 implemented.

13 Again, the different path to go for if
14 you don't have an exceedance, you know, it's fine
15 the way it is. If you have exceeded a high
16 frequency, this is all the area you need to do about
17 it. Path 3 you walk through, if I can demonstrate
18 the capacity of the plant, I'm fine.

19 Path 4 is one that's perhaps the purest,
20 if I may call it that way just for now. It looks at
21 the three phases, you know, one, the third phase
22 being offsite, it's not a problem. It's remote
23 enough so it shouldn't be an issue.

24 So now that leaves us with the two
25 phases, and installed plant equipment and the FLEX,

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1 portable FLEX on site. So the installed plant
2 equipment what we try to utilize, what the industry
3 submitted and the staff had seen to be reasonable is
4 there's a considerable body of margin studies have
5 been done.

6 The one that comes to my mind is an EPRI
7 report that's NP-60-41. It's a large document that
8 walks through based on test data and shake table
9 data for components and also observed seismic, you
10 know, seismic behavior that a plant equipped with
11 SSEs they have two to three times the capacity if
12 they were, you know, designed, used the appropriate
13 codes and standards and they were installed
14 appropriately.

15 So they give a number a caveats to make
16 that point. They give a number of caveats for
17 different systems. So they walk, for a piping
18 system you'd have that capacity provided that you
19 need these criteria.

20 For a Cat. 1 structure, concrete or
21 steel, you have this capacity provided. You need
22 these criterias.

23 So what we're alluding to in here is as
24 long as you're within two times SSE and you meet
25 these criteria, criteria, then you have the

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1 capacity. So that covers plant equipment.

2 In the second part of Path 4 it says
3 what do you do with the --

4 MEMBER RICCARDELLA: But my question is
5 isn't plant equipment already being considered --

6 MR. SHAMS: Hold on a second.

7 MEMBER RICCARDELLA: -- in another
8 exercise, which is 3.1?

9 MR. SHAMS: They are, yeah. But it may
10 or may not be the same set of equipment. That's the
11 difference.

12 Under 2.1 it can be a broader set of
13 equipment. Under 2.1 also you can have, you can
14 have actually seen that there's not necessarily a
15 sufficient increase in hazard so we told the
16 licensee you don't need to do a risk assessment.

17 So what you're seeing here is the
18 licensee basically reiterating that I think my
19 hazard is low enough I don't need to, I can rely on,
20 you know, what, you know. So that I mean it's very
21 clear. You're right. You're absolutely right. The
22 two paths are very close. We're trying to answer
23 two questions. It wasn't designed to be that way
24 early on and now we're trying to answer two
25 different questions but yet leverage the same

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1 information.

2 CHAIR STETKAR: Path 4, if I can -- I
3 have to be cognizant of the time here a little bit,
4 and we'll continue this in the next meeting -- Path
5 4, the reason I have less of a problem, I personally
6 have less of a problem with Path 4 than I did with
7 Path 3, is that Path 4 tells me -- and I don't know
8 what people have actually done here, but it says
9 that apparently some people invoked the so-called
10 expedited seismic evaluation process when they
11 developed their initial FLEX strategies.

12 And that says, well, we'll essentially
13 develop assurance that our FLEX equipment, storage
14 locations and connection points and all of that
15 stuff to implement FLEX has sufficient capacity up
16 to twice the design basis ground motion response
17 vector.

18 And Path 4 says, okay, as long as you're
19 less than twice you can take credit for that
20 evaluation that you did already. Great. That says,
21 but that says that I'm evaluating both in-plant
22 equipment and FLEX equipment and storage and
23 connections and all of that kind of stuff.

24 MEMBER RAY: But that's not what you
25 just said.

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1 CHAIR STETKAR: I know. I don't care
2 what he said. I'm --

3 MEMBER RAY: No. You.

4 CHAIR STETKAR: What?

5 MEMBER RAY: You said it was applied to
6 FLEX equipment. Now you're saying it's applied to
7 both installed plant equipment and FLEX equipment.

8 CHAIR STETKAR: That's part of the FLEX
9 strategy. I need to use my turbine-drive aux
10 feedwater pump for the first phase 1 coping time,
11 and then I need to hook up a suction source for the
12 pump or an alternate way of feeding the steam
13 generators.

14 This says that some people decided to
15 evaluate their FLEX strategy, which includes both
16 stuff in the plant and stuff in buildings, to
17 survive an acceleration up to twice the design
18 basis.

19 MEMBER RICCARDELLA: But it's only that
20 plant equipment needed for FLEX.

21 CHAIR STETKAR: Right. Well, --

22 MEMBER RAY: Now wait a minute. That's
23 what is not clear to me.

24 CHAIR STETKAR: But to come back to -- I
25 agree with Mo's original -- I believe, by the way,

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1 that PRA is the most comprehensive, but I'll give
2 you that Path 4 is a heck of a lot more
3 comprehensive than Path 3. The problem that I have
4 with Path 3 is that Path 3, I get an out by never
5 demonstrating in Path 3 that the FLEX equipment can
6 survive anything more than the original plant design
7 basis earthquake.

8 MR. SHAMS: Mike, just if I may, a short
9 comment. What Mike alluded to is that the FLEX
10 equipment, even the portable one, are designed to
11 the design basis, just like the plant equipment. So
12 there's inherent margin in that. We just didn't
13 particularly quantify what that margin is. But
14 there's an inherent margin in that. Just, again,
15 given the conservatism and how we use codes and
16 material and properties.

17 CHAIR STETKAR: See, my point is why
18 give people an out on Path 3? Why not just say Path
19 4 is what you want?

20 Because that will tell them to look at
21 everything and you'll evaluate whatever margin was
22 in your FLEX equipment. And you can take credit for
23 all of that good stuff that was done in the IPEEEs
24 to develop, you know, fragilities for new plant
25 equipment and DCLFs and all of that, you know,

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1 stuff.

2 And it would satisfy the need to at
3 least say, yes, we took a look at the FLEX equipment
4 and strategies that was installed based on the
5 original evaluation, and we have confidence that it
6 will survive at least against the reevaluated
7 seismic hazard, without, without having kind of this
8 artificial way of getting out for, you know, I don't
9 care, eight plants or whatever who don't have to
10 look at the FLEX, might not have to.

11 MR. SHAMS: It's only a purer way to go
12 with everyone doing a Path 4. But, again, the idea
13 was to utilize every piece of information the plant
14 has and not to overburden people with analyses that
15 ultimately would basically just add to the decision,
16 which is already known: the plant can survive. So
17 that was the logic the staff used.

18 CHAIR STETKAR: Let's -- I do have to be
19 somewhat cognizant of time.

20 We certainly, you at least you've
21 satisfied given your feedback. I think you've heard
22 that there's some concern about the Path 3
23 assessments and how they might be applied. Do you
24 have any more comments for the staff, or questions?
25 Anybody?

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1 (No response.)

2 CHAIR STETKAR: Okay. Let's go through,
3 Mike, get the outside line open. I don't know if
4 anybody is on the outside or not.

5 Let me ask while we're doing that if
6 there is anyone -- I'm running the meeting. We're
7 trying to give them quick feedback. We're up
8 against the wall on time here.

9 So, Tim, you know, I apologize. We're
10 truncating stuff. That's fine.

11 MR. REED: Perfectly fine with us.

12 CHAIR STETKAR: Especially because we're
13 going to need this at DG 13-01 anyway later.

14 While we're getting the outside bridge
15 line open is there anyone in the room who would like
16 to make a comment? If so, come up to the microphone
17 and do so.

18 (No response.)

19 CHAIR STETKAR: Hearing nothing, if
20 there is anyone on the bridge line, do me a favor
21 and just say hello so we have confirmation that it's
22 open.

23 PARTICIPANT: Hello.

24 CHAIR STETKAR: Thank you.

25 And if there's anyone of the public on

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1 the bridge line who would like to make a comment,
2 please identify yourself and do so.

3 (No response.)

4 CHAIR STETKAR: Hearing nothing, we'll
5 re-close the bridge line so it doesn't pop.

6 And as we usually do during subcommittee
7 meetings I will take one pass around the table.
8 I'll start with Steve, as I did yesterday, put him
9 on the -- Steve, do you have any final comments?
10 Turn your microphone on.

11 DR. SCHULTZ: Just one. And that has to
12 do with what we've already discussed. That is,
13 first, I'm glad that NEI is continuing to lead
14 industry activity associated with sharing industry
15 experiences. Implementation is being done.

16 But I would just segue that into
17 expecting that NEI is going to work on capturing
18 what is found in that in guidance for the future.
19 And I think, Tim, you've stated it well, that in
20 doing what we need to do for mitigating strategies
21 in a rulemaking we need to be sure that the final of
22 the final rule and the supporting documents, all are
23 very clearly written so that they can be not only
24 used today but supported and maintained as we expect
25 them to be in terms of implementation down the road,

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1 decades as well as a few years.

2 Thank you.

3 CHAIR STETKAR: Thank you. Pete?

4 MEMBER RICCARDELLA: Yeah. Despite what
5 it might sound like from the comments, I think
6 industry and the staff have made significant
7 progress in this Appendix H area. And I'm just
8 looking forward to seeing what Path 5 is going to
9 look like.

10 CHAIR STETKAR: Harold?

11 MEMBER RAY: Yeah. I obviously need to
12 do some more homework. But I would just observe
13 that when we do talk about Path 5 I can't guarantee
14 that there won't be some sliding back into Path 4 at
15 that point in time. And that's fine.

16 CHAIR STETKAR: Dick?

17 MEMBER SKILLMAN: No comment. Thank
18 you.

19 CHAIR STETKAR: Dana?

20 MEMBER POWERS: Nothing.

21 CHAIR STETKAR: Dennis?

22 MEMBER BLEY: Nothing.

23 CHAIR STETKAR: Ron?

24 MEMBER BALLINGER: Nothing.

25 CHAIR STETKAR: Charlie?

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1 MEMBER BROWN: No.

2 CHAIR STETKAR: Joy?

3 MEMBER REMPE: No.

4 CHAIR STETKAR: Thanks to everyone,
5 staff and the industry. I know I truncated the last
6 one pretty quickly but, as I said, we wanted to get
7 your feedback.

8 Make sure that we start talking about
9 the schedule to revisit this in a timely fashion.

10 And with that, we are adjourned for this
11 meeting.

12 (Whereupon, at 12:36 p.m., the above-
13 entitled matter was adjourned.)

14

15

16

17

18

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NEI 12-06, Rev. 2

Summary of Changes

ACRS Fukushima Subcommittee

April 22, 2016



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STORIED HISTORY
BRIGHT FUTURE

NEI 12-06, Rev. 2

- Revision 2 to NEI 12-06 addresses:
 - Conformance to proposed rule
 - Elimination of references to Orders
 - Changes to incorporate NRC-approved alternatives
 - Generic issue position papers (15)
 - Frequently asked questions (32)
 - Appendix E- Validation
 - Appendix G- Flooding Mitigating Strategy Assessment
 - Appendix H- Seismic Mitigating Strategy Assessment

Conformance to Proposed Rule

- Added references to NEI 14-01, 12-01, and 13-06 as applicable
- Removed references to Orders EA-12-049, EA-12-051, and EA-12-050
- Deleted Tables 1-1 and 1-2-Order language
- Removed references to 10 CFR 50.54(hh)(2)

NRC-Approved Alternatives

- FLEX equipment may be portable, pre-staged or installed
- Distinguishes between installed plant equipment and installed FLEX equipment in that FLEX equipment has a “primary function” to support FLEX strategies
- Replaced “installed” equipment with “plant” equipment throughout

Generic Issues Papers

- Battery Duty Cycles
- Boron Mixing
- BWR Anticipatory Venting
- CENTS Code
- FLEX Maintenance
- MAAP Analysis
- Shutdown Modes
- NOTRUMP Code
- SHIELD RCP Seals
- FLOWSERVE RCP Seals
- Westinghouse RCP Seals
- National SAFER Response Centers
- Change processes
- Mrule
- Hoses and Cables

Generic Issues Table

Issue	Subject	Guidance	NRC Endorsement	Notes Concerning Endorsement
Battery Duty Cycles	Extended battery life calculations for batteries	Nuclear Energy Institute (NEI) August 27, 2013 "Extended Battery Duty Cycles"	ML 13241A188	Letter contains limitations
Boron Mixing	PWR Boron mixing	PWROG LTR-FSE-13-46, Rev. 0	ML 13276A183	Letter contains limitations
BWR Anticipatory Venting	EOP override limits when only steam driven pump available	BWROG-13059 November 1, 2013	ML 13358A206	None
CENTS Thermal-Hydraulic Code	Code handling of 2 phase flow and reflux cooling in PWRs	PWROG LTR-TDA-13-XX, Rev. 0-A (DRAFT)	ML 13276A555	Letter contains limitations.
Maintenance Guide for FLEX	PM basis from EPRI Template	EPRI 3002000623	ML 13276A224	None

Frequently Asked Questions

- Section 3.2.1.2- FLEX analyses do not need to assume minimum conditions for Operability
- Section 3.2.1.3- clarified that plant equipment is available if it is robust for the hazards for which it is credited
- Section 3.2.2(14)- clarified SFP heat load assumptions for calculating response time and equipment sizing

Frequently Asked Questions

- Section 3.2.2(16)- Removed the requirement for spare hoses and cables to meet N+1
- Section 3.3- incorporated the indefinite coping clarification that detailed plans do not need to be explicitly developed for beyond 72 hrs
- Section 5.3.3.1- Modified guidance for alternate instrument readings at containment penetrations

Frequently Asked Questions

- Section 7.3.1.1.c- added guidance for determining tornado separation distance
- Section 7.3.1.1.b. & c- added guidance that allows tornado separation criteria to be applied to installed equipment
- Section 7.3.1.2- added this section to provide examples of acceptable reasonable protection for tornadoes

Other Changes

- Added validation guidance in Appendix E
- Appendix G- Added this appendix providing guidance for performing a mitigating strategies assessment for the reevaluated flooding hazard
- Appendix H- Added this appendix providing guidance for performing a mitigating strategies assessment for the reevaluated seismic hazard

FLEX Validation Industry Involvement & NEI Template April , 2016

EXCELLENCE in Nuclear Safety Management

Michael Powell
Director , Fukushima Initiatives
Arizona Public Service Company



NEI VALIDATION TEAM

- Goals & Objectives Validation Template
 - Augment NEI 12-06
 - NRC Expectations
 - Consistent process
 - Prove tasks, manual actions and decisions for FLEX are feasible and executable
 - Qualitative Assessment on Human Factors and Margin
 - Integrated Review of FLEX strategies
 - Separate Validation and Verification

NEI VALIDATION TEAM

CHALLENGE – The Term Verification is Routinely Interchanged with Validation

- Utility Verification Options
 - Utilize “Normal” Work Process
 - Develop New Methods
 - Integrate with Validation

VALIDATION PROCESS

The validation process consists of:

- Identifying the tasks, manual actions and/or decisions that require validation
- Selecting the appropriate graded approach
- Conducting the validation
- Documenting the results

TSA IDENTIFICATION

- Time Sensitive Actions (TSAs) identified as a Time Constraint in Overall Integrated Plan (OIP), Attachment 1A, “Sequence of Events Timeline” will be validated.

TSA IDENTIFICATION

Table Item	Elapsed Time (hr)	Time Constraint	Action	OIP Ref	Remarks	Action Location/Owner	VALIDATION LEVEL SELECTED
	0		Event Starts		Plant @ 100% power		
4.1	0.80	1	Operations Declare ELAP			OPS/CR	A
5	0.80	1	Operations Enters FSGs		Key predecessor activity for ELAP mitigation	OPS/CR	
7	2		Complete DC Load Shed	16	Ensure battery coping times/assumptions are met	OPS/	A
11	4		Operations completes RCS Cooldown/Maintains SG Pressure	5	Analytical basis assumes cooldown initiation time of 1 hour and cooldown rate of 70 °F/hr	OPS CR	A
13	16	16	ADV's Manually Operated to Maintain RCS Heat Removal	4	ADV's must be manually operated once the N2 supply is depleted. This manual operation is currently a JPM	OPS MSSS	B
14	26	35	Deploy FLEX PHASE 2 800kW 480V Generators	15	The installation of the FLEX generators supports both RCS Makeup and DC Power. The time constraint is RCS Makeup. The FLEX Generator provides the option of powering an installed Charging Pump or the FLEX RCS Makeup Pump. The FLEX Generator also supports the restoration of AC and DC Power (batteries will be depleted at ~T+39 hours).	FD OPS FLEX Storage South Yard Control BLDG	B

SELECT VALIDATION APPROACH

- Graded Approach
 - Apply a higher level of detail and rigor to validations for TSAs that occur shortly after the event.
 - Level A: TSAs started within the first 6 hours
 - Level B: TSAs started between 6 and 24 hours after the event
 - Level C: Other tasks or manual actions in the OIP/FIP that are labor intensive or required significant coordination

VALIDATION CRITERIA

VALIDATION ELEMENT	VALIDATION GRADATION		
	LEVEL A	LEVEL B	LEVEL C
Timed Validation	YES	*YES	N/A
Simulated Scenario	YES		
In-Plant Walkthroughs	YES	YES	
Timed Demonstrations	YES	YES	
Records	YES	YES	
Table Top		YES	
Reasonable Judgment	*YES	YES	YES
Resources	Phase 2 Staffing Study Tools and Equipment expected available	Phase 2 Staffing Study Augmented personnel Tools and Equipment expected available	On-site and Augmented personnel (including SAFER)
Validation Confidence	Multiple performances using different personnel required: Margin available for the task Consequences of task failure that would result in a failure of the strategy to maintain key safety functions. Consequences of suboptimal performance	Multiple performances using different personnel should be considered	Not Required

CONDUCT OF VALIDATION

- Create a validation plan commensurate with the validation level selected
- Use one or more of the specified methods specified
- Document Plan in Table C

DC LOAD SHED EXAMPLE

VALIDATION DOCUMENTATION

- NEI Validation Template

Table A	Validation Item Results
Table B	Validation Team Members
Table C	Validation Performance
Table D	Other Considerations
Table E	Performance Attributes
Table F	Conclusions
Table G	References

VALIDATIONS & INTEGRATED REVIEW

- Validation plan provides reasonable confidence
 - Timely execution of TSA
 - Margin to account for unknown

VALIDATION INTEGRATED REVIEW

- Ensure adequate resources available to accomplish the FLEX strategy as a whole
 - Resource loaded schedule
 - Spreadsheet
- Validates logical progression of activities

VALIDATION FREQUENCY

- Validation Template Does Not Require Periodic “Re-validation”
 - Exception – Change to FLEX Strategy
- “Informal” Validation
 - Pre-Deployment to support Outages

PALO VERDE'S VALIDATION APPROACH

- PVNGS Validation Challenge
 - 3 Unit Implementation
- Validation Method
 - Validated Single Unit
 - Applied Times (Adjusted) to Other Units
 - Assumed Minimum Staff Available
 - Developed Primavera P6 Schedule
 - Resource Loaded
 - Personnel
 - Equipment Resource

PALO VERDE'S VALIDATION APPROACH

- Control Room TSAs Validated in Simulator During FLEX Training (All Crews)
- Auxiliary Operator TSAs Validated in the Plant (All AOs) via Walkthrough Simulations.
- Deployment of FLEX Equipment Validated via Physical Deployment of Equipment Using the Phase 2 Staffing Study Minimum Staffing Compliment.

FLEX Deployment Matrix

79IS-9ZZ07 Appendix T Attachment 1 (Package 1)

Vehicle	Deployment Group 1		
Communications Vehicle #1	Communications Trailer		
Communications Vehicle #2			
Communications Vehicle #3			
Polaris FLEX ATV	Unit 1 10kW Generator	Unit 2 10kW Generator	Unit 3 10kW Generator

79IS-9ZZ07 Appendix T Attachment 2 (Package 2)

Vehicle	Deployment Group 1	Deployment Group 2	Deployment Group 3
Yard Truck #1	U1 LC31/33 Generator	U2 LC31/33 Generator	U1 RCS M/U Pump
Yard Truck #2	U1 LC31/33 Cable Trailer	U3 LC31/33 Generator	U2 RCS M/U Pump
F350 #1	U2 LC31/33 Cable Trailer	U1 Fuel Cube	U2 Fuel Cube
F350 #2	U3 LC31/33 Cable Trailer	U3 Fuel Cube	U3 RCS M/U Pump

79IS-9ZZ07 Appendix T Attachment 3 (Package 3)

Vehicle	Deployment Group 1	Deployment Group 2	Deployment Group 3
Yard Truck #1	U1 LC35 Generator	U2 LC35 Generator	U1 SFP M/U Pump
Yard Truck #2	U1 LC35 Cable Trailer	U3 LC35 Generator	U1 S/G M/U Pump
F350 #1	U2 LC35 Cable Trailer	U2 SFP M/U Pump	U2 S/G M/U Pump
F350 #2	U3 LC35 Cable Trailer	U3 SFP M/U Pump	U3 S/G M/U Pump

Color Coding	Unit 1
	Unit 2
	Unit 3

NEI 12-06

Appendix G

April 22, 2016

Jim Riley

Sr. Technical Advisor, NEI



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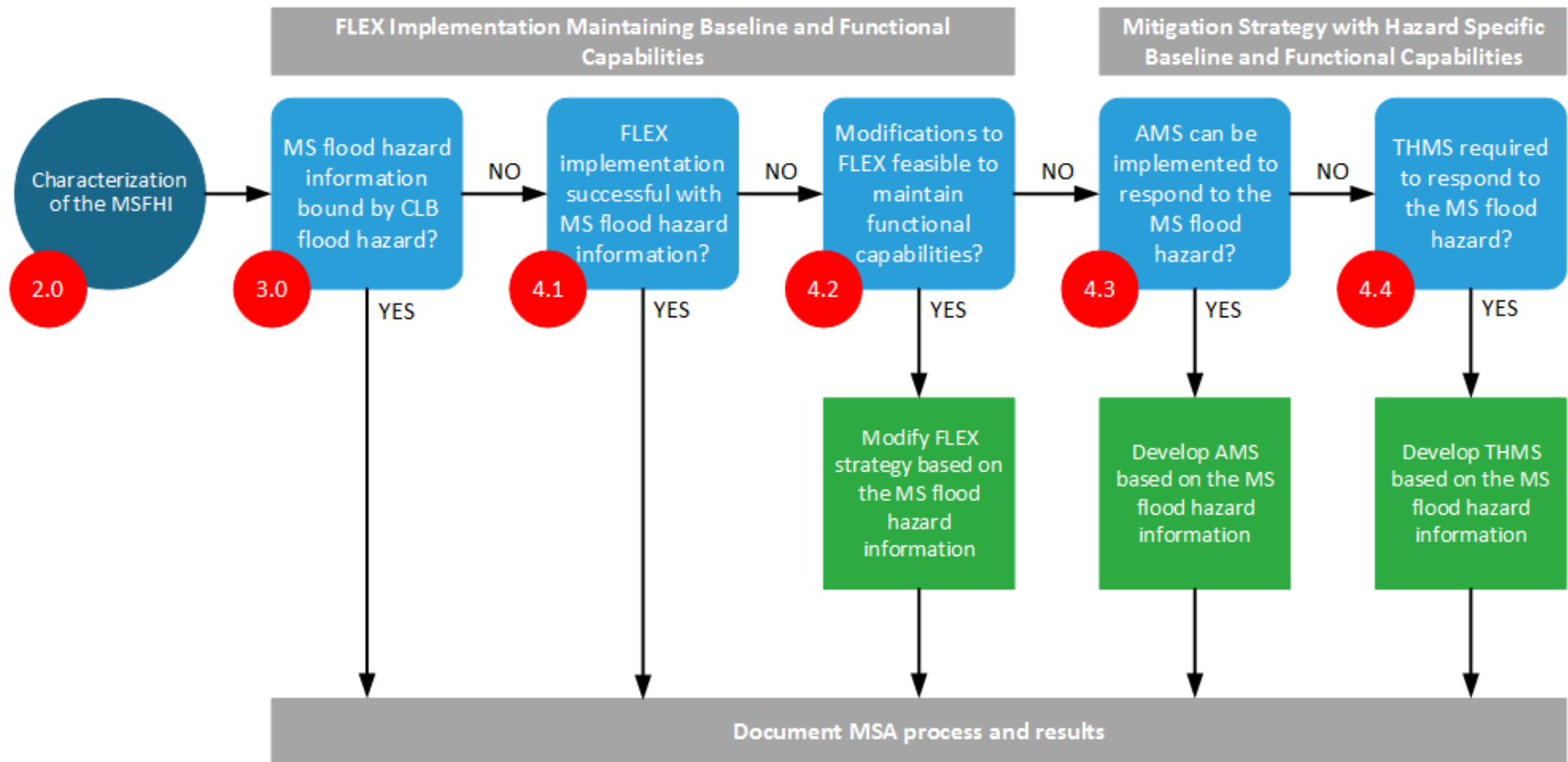
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Appendix G- Reevaluated Flood Hazard

- Five paths for flooding Mitigation Strategies Assessment (MSA):
 - Flood < FLEX DB
 - FLEX OK
 - Modify FLEX
 - Alternate Mitigating Strategy (AMS)
 - Targeted Hazard Mitigating Strategy (THMS)
- MSAs due by Dec 31, 2016 or 1 year after the Staff's MSA input letter
 - Submittal templates developed

NEI 12-06 App G

Mitigating Strategies Assessment



General Approach

- Scope
 - Evaluates implementation of mitigating strategies under the conditions determined by the 50.54(f) letter flood reevaluation
- Technical
 - Design and validation guidance in NEI 12-06
- Submittal
 - Summary level
 - Describe changes and basis
- Detailed documentation on site

Characterize the Flood

- Use the reevaluated flood parameters
- Compare to FLEX design basis
- Reevaluated flood < FLEX design basis
 - No further evaluation required
- Reevaluated flood > FLEX design basis
 - Evaluate the effect on FLEX strategy
 - Complete MSA for applicable mechanisms
 - Ensure baseline capabilities of FLEX to cope with ELAP and loss of UHS are maintained for other events

Effect on Original FLEX Strategy

- Complete this evaluation for all flood mechanisms where FLEX DB flood does not bound the reevaluated flood
- Evaluate impact of reevaluated flood on existing FLEX design
 - Boundary conditions and assumptions
 - Sequence of events
 - Storage provisions
 - Deployment locations
 - Robustness of plant equipment
 - Connection points
 - Manual actions
 - Flood protection features
- Provide basis for assumed time of ELAP if not caused by flood

FLEX OK ?

- Document if no changes in FLEX features or strategy are necessary
- If changes are necessary
 - Document those aspects of FLEX strategy that could not be implemented as designed
 - Document mitigating strategy used for each flood mechanism
 - Evaluate the strategy used for each applicable flood mechanism

All MSAs

- Use reevaluated flood parameters
- Address design features and sequence of events determined to be affected
- Use the evaluation processes defined by NEI 12-06
- Document the evaluation and all changes in FLEX Program Document
- Submit a summary of:
 - Basis for the strategy
 - THMS requires justification for not maintaining containment capability
 - All changes

Modify FLEX

- Reestablishes FLEX strategy
 - Uses FLEX equipment and general approach, but changes either sequence of events, actions, or strategy details as compared to original design
 - Key safety functions maintained
- Basis for time of assumed ELAP must be provided

AMS or THMS

- Uses a combination of FLEX equipment and installed plant equipment
- ELAP and loss of normal access to the UHS are assumed only if caused by the flood
- Key safety functions
 - AMS Maintains core and spent fuel pool cooling and containment capability
 - THMS does not maintain containment capability
- Equipment whose primary function is to support AMS or THMS must meet FLEX equipment standards
- Preserve FLEX equipment if feasible

NEI 12-06

Appendix H

April 22, 2016
Andrew Mauer
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Status

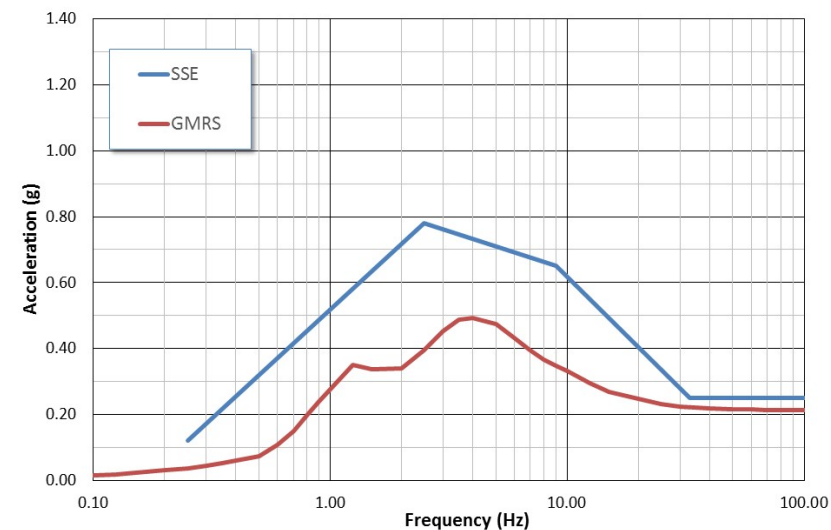
- Appendix H contains guidance for mitigation strategy assessments (MSA) for all plants where the $GMRS \leq 2xSSE$
- These MSAs will be submitted by August 2017
- JLD-ISG-2012-01 endorsed the guidance on January 22, 2016
- All MSAs for seismic maintain the three key safety functions of core cooling, containment, and spent fuel pool cooling
- Appendix H contains a placeholder for plants with a $GMRS > 2xSSE$ and the industry is currently developing guidance to support these MSAs

Seismic MSA Paths

Appendix H MSA Path	Relationship between Reevaluated Seismic Hazard and Seismic Design Basis
Path 1	$GMRS < SSE$
Path 2	$GMRS > SSE$ only > 10 Hz
Path 3	$GMRS > SSE$ but $< IPEEE$ (1-10 Hz)
Path 4	$GMRS \leq 2 \times SSE$ (1-10 Hz)
Path 5	$GMRS > 2 \times SSE$

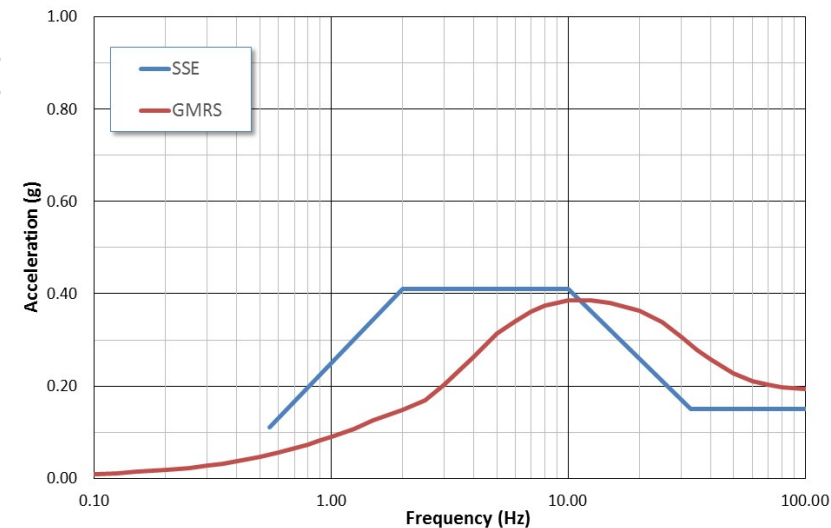
Path 1

- GMRS is bounded by the SSE at frequencies 1 Hz and greater
- Additional evaluation is unnecessary
- The FLEX strategies can be implemented as designed and no further seismic evaluations are necessary



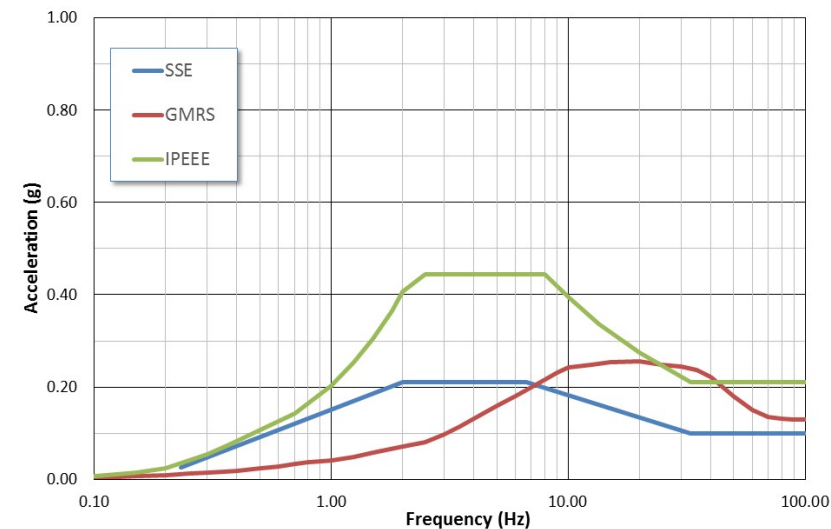
Path 2

- GMRS spectrum exceeds the SSE spectrum only above 10 Hz
- MSA to be performed to evaluate high frequency sensitive plant equipment
- The MSA will confirm that the FLEX strategies can be implemented as designed or identify where plant mods may be needed



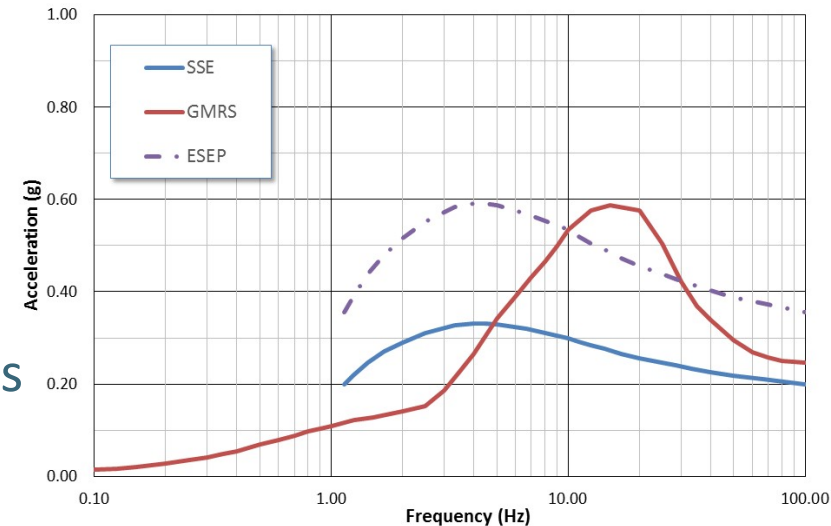
Path 3

- IPEEE Capacity spectrum bounds the GMRS between 1-10 Hz
- MSA based upon IPEEE evaluation of the safe shutdown paths to demonstrate robustness to GMRS (Alternate Mitigating Strategy or AMS)
- In addition to the AMS, the MSA will address indefinite coping, spent fuel pool cooling, and high frequency exceedances
- The AMS demonstrates that the plant can safely shutdown given the GMRS and will confirm that the FLEX strategies can be implemented as designed to ensure spent fuel pool cooling or identify where plant mods may be needed
- Note: May elect to follow Path 4



Path 4

- GMRS exceeds the SSE between 1-10 Hz but by no more than 2 times
- Relies upon:
 - Expedited Seismic Evaluation Process
 - Qualitative assessment of certain SSCs based on seismic experience
 - Quantitative assessment of remaining FLEX SSCs
- The MSA will also address spent fuel pool cooling and include a high frequency evaluation consistent with Path 2
- The MSA will confirm that the FLEX strategies can be implemented as designed or identify where plant mods may be needed



Industry Comments: MBDBE Rulemaking

April 22, 2016

Jim Riley

Sr. Technical Advisor, NEI



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Topics

- Comment Letter
- Significant Comments
- Conclusions

Comment Letter

- Consolidated comments submitted on Feb 9th
 - DG-1301: 22 comments
 - DG-1317: 4 comments
 - FRN: 37 comments
 - Responses to all questions
- Numerous suggestions, some significant, but no known “show stoppers”
 - Includes suggested changes to rule language

Significant Comments

- Implementation Time
 - Site status varies considerably
 - Implementation schedule should not be pre-defined
 - Sites should submit proposed implementation schedules

Significant Comments

- Change Control Process
 - NRC review only required if a change does not continue to meet the rule
 - Rule should clearly address the application of other change control processes
 - Differentiate between design basis and beyond design basis conditions

Significant Comments

- Addressing the Reevaluated Hazards
 - Mitigating the effects of the reevaluated hazard should apply to both the equipment and strategies
 - Allow for Targeted Hazard Mitigating Strategy (THMS)
 - Allow utilization of risk insights

Significant Comments

- Use of Adequate Protection to justify multi-source dose assessment
 - Adequate protection exception to backfit protection should not apply
 - Demonstrate that the requirement will result in a cost-justified substantial increase in safety
 - Industry has voluntarily implemented multi-source dose assessment capability

Significant Comments

- Spent Fuel Pool Instrumentation (SFPI)
 - Keep SFPI requirements separate from mitigating strategies
 - Underlying Orders differ in purpose and character
 - SFPI Order requires installation of reliable instrumentation, it does not require actions
 - Treatment of reevaluated hazard is also different

Conclusions

- No significant misalignment with the Staff
- Should engage Staff on
 - Proposed rule language changes
 - Concerns about specific provisions
 - Responses to rulemaking questions



Draft Regulatory Guides for the Mitigation of Beyond-Design-Basis Events Rulemaking

ACRS Fukushima Subcommittee

Eric E. Bowman

April 22, 2016

DG-1317: Wide-Range Spent Fuel Pool Level Instrumentation

- Proposes to carry forward the endorsement on NEI 12-02, Revision 1 from JLD-ISG-2012-03
- No substantive changes are intended
- RG 1.227 will reflect resolution of comments received on the proposed rule with regards to the spent fuel pool instrumentation requirement

DG-1319: Integrated Response Capabilities for Beyond-Design-Basis Events

- Proposes to carry forward endorsement of NEI 12-01 for staffing and communications
- Proposes to endorse NEI 13-06, “Enhancements to Emergency Response Capabilities for Beyond Design Basis Events and Severe Accidents,” and NEI 14-01, “Emergency Response Procedures and Guidelines for Beyond Design Basis Events and Severe Accidents”
- Addresses SRM-SECY-15-0065 direction that “staff should ensure that any NRC-endorsed guidance for the proposed rule will provide for appropriate coordination of the FLEX support guidelines, extreme damage mitigating guidelines, and voluntarily maintained SAMGs with the existing Emergency Operating Procedures (EOPs) at each plant (e.g., appropriate transition criteria between EOPs and guidelines and clarity of command and control).”
- RG 1.228 will reflect resolution of comments received on the proposed rule

DG-1301: FLEXIBLE MITIGATION STRATEGIES FOR BEYOND-DESIGN-BASIS EVENTS

- Proposes to carry forward JLD-ISG-2012-01, Revision 1 endorsement of NEI 12-06, Revision 2
- Incorporation of alternate approaches
- Resolution of lessons learned from implementation
- Reorganization to follow the proposed rule structure
- Treatment of reevaluated hazards
- RG 1.226 will reflect resolution of comments received on the proposed rule

Mitigation of Beyond-Design-Basis Events (MBDBE) Rulemaking

Advisory Committee on Reactor Safeguards
Fukushima Subcommittee

April 22, 2016

Background

- Issued proposed MBDBE rule on November 13, 2015 for a 90-day comment period (80 FR 70609)
- Comment period closed on February 11, 2016
- 20 Comment submissions
- NRC staff is currently reviewing the public comments
 - Preliminary thoughts - next slide
 - Management alignment has not occurred at this time

Preliminary Review of Comments

- Many good comments that should enable NRC to clarify the final rule
 - Align the final MBDBE rule with ongoing Order implementation
 - Produce a final rule that better defines the requirements and contains a supporting SOC that documents the meaning and intent
- Currently we are focusing on the following areas with regard to the MBDBE rule/supporting SOC):
 - Clarify “loss of all ac”
 - Improve how reevaluated hazards are addressed (align with SRM-COMSECY-14-0037 implementation)
 - Clarify change control
 - Reconsider backfit justification supporting multiple source term dose assessment requirements
 - Enable more flexible implementation that reflects ongoing activities
- Conforming changes to guidance documents may be needed in some cases