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

NEAL R. GROSS AND CO., INC.
Court Reporters and Transcribers
1323 Rhode Island Avenue, N.W.
Washington, D.C. 20005
(202) 234-4433

DISCLAIMER

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

The contents of this transcript of the proceeding of the United States Nuclear Regulatory Commission Advisory Committee on Reactor Safeguards, as reported herein, is a record of the discussions recorded at the meeting.

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

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

+ + + + +

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

(ACRS)

+ + + + +

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

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

C O N T E N T S

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

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

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

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

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

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

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

off. Otherwise, we will destroy them.

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

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

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

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

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

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

What I'm going to cover briefly is some

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

that would be very difficult to perform that.

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

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

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

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

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

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

MEMBER RAY: Can we ask you a question?

MR. BAUER: Yes, sir.

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

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

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

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

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

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

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

MR. BAUER: No.

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

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

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

MR. BAUER: Right.

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

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

This is a yes or no.

MR. BAUER: No.

CHAIR STETKAR: Thank you.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

MEMBER RAY: But you talked about fire protection.

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

MEMBER RAY: Yes, go ahead.

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

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

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

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

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

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

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

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

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

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

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

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

CHAIRMAN STETKAR: And the question is why not?

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

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

MR. RICHARDS: So, if I might --

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

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

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

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

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

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

MR. RICHARDS: I understand.

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

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

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

CHAIR STETKAR: I understand the question. Good question.

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

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

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

MR. BAUER: All right --

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

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

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

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

But, let's go on.

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

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

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

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

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

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

CHAIR STETKAR: Oh.

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

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

MR. BAUER: Oh, okay.

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

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

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

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

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

risk.

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

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

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

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

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

And as long as those integrated seismic

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

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

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

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

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

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

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

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

MR. RICHARDS: So, the idea is --

CHAIR STETKAR: Okay. Well, we have the

comment on the record.

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

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

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

MR. RICHARDS: They are.

MEMBER BLEY: Okay.

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

And those evaluations are underway now.

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

MR. RICHARDS: Yes, sir.

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

between two units.

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

MR. RICHARDS: They're at power.

CHAIR STETKAR: Okay.

MR. RICHARDS: Yes.

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

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

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

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

MR. POWELL: Good morning, I'm Mike

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

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

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

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

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

in subsequent slides.

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

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

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

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

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

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

I'll get to that in a few slides.

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

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

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

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

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

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

Time Sensitive Action.

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

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

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

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

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

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

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

CHAIR STETKAR: Mike?

MR. POWELL: Yes, sir?

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

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

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

No matter who I need, they're there.

MR. POWELL: That's not the intent.

CHAIR STETKAR: Okay.

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

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

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

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

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

enough people available at six hours to move things around.

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

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

I'm not aware of anybody myself --

CHAIR STETKAR: For Level A.

MR. POWELL: For Level A. Yes.

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

MR. POWELL: Level B. Yes.

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

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

CHAIR STETKAR: Okay.

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

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

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

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

MR. POWELL: But I --

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

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

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

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

evaluations.

MR. POWELL: Right.

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

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

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

CHAIR STETKAR: All right.

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

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

MR. POWELL: Sure.

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

That's the big concern for me.

DR. SCHULTZ: Jim, can we --

MR. POWELL: Okay.

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

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

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

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

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

MR. POWELL: And that's the --

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

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

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

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

MR. POWELL: Yes. Or --

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

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

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

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

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

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

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

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

MR. POWELL: I understand.

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

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

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

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

MR. POWELL: Yes, sir?

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

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

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

How do you make the distinction between

those two? What is reactive and what is anticipatory?

MR. POWELL: That's a good question.

MEMBER SKILLMAN: Does it even matter?

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

CHAIR STETKAR: Mike, I'm going to

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

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

MR. POWELL: That's fine. Okay.

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

MR. POWELL: Sure.

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

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

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

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

do it at all.

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

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

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

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

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

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

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

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

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

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

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

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

MR. POWELL: Yes.

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

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

CHAIR STETKAR: Yes.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

equipment.

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

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

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

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

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

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

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

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

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

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

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

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

And I think that will be a good thing in

the long term.

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

And I hope we end up with middle ground.

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

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

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

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

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

DR. SCHULTZ: Good. Thank you.

CHAIR STETKAR: Mike, I have one more on

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

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

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

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

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

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

to look at unavailability and that kind of stuff.

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

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

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

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

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

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

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

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

And why have you not instituted that?

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

(Laughter.)

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

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

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

and reliability. And pointed to those attachments.

MR. BAUER: Right.

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

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

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

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

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

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

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

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

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

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

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

(Laughter.)

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

I'm going to try to keep us somewhat on

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

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

If not, Jim, you're up.

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

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

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

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

The third is modifying FLEX. All of

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

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

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

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

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

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

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

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

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

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

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

MR. RILEY: Yes.

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

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

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

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

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

CHAIR STETKAR: Okay. Go ahead.

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

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

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

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

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

general what the process is.

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

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

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

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

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

And there's a word missing there. That

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

MR. RILEY: That's correct. Yes.

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

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

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

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

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

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

MR. RILEY: Pardon me?

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

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

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

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

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

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

CHAIR STETKAR: Yes, okay.

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

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

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

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

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

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

MR. RILEY: I think John, to answer your

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

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

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

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

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

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

assessment, right?

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

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

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

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

MR. RILEY: Maybe so.

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

MR. RILEY: Yes.

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

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

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

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

CHAIR STETKAR: Right.

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

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

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

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

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

But, I'll grant you the question.

CHAIR STETKAR: Okay.

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

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

CHAIR STETKAR: The flooding reevaluation requires a duration.

MR. RILEY: Yes. It does.

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

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

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

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

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

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

CHAIR STETKAR: Right.

MEMBER RAY: Whether it's longer.

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

MEMBER RAY: Okay.

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

MEMBER RAY: Yes. Okay.

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

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

licensing basis if it wasn't done previously.

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

MEMBER RAY: Right.

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

CHAIR STETKAR: Okay.

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

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

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

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

Stating that fact, since the design basis for FLEX.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

12.06 gives us the guidance we need on

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

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

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

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

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

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

very few.

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

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

CHAIR STETKAR: Good.

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

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

CHAIR STETKAR: Oh, is that -- really?

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

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

CHAIR STETKAR: Yes.

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

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

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

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

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

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

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

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

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

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

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

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

MEMBER SKILLMAN: Okay. Thank you.

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

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

And that's my last slide.

CHAIR STETKAR: Any more questions on Appendix G?

(No response.)

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

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

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

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

MR. MAUER: Oh.

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

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

(No audible response.)

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

MR. HARDY: Yes, I am here.

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

MR. MAUER: Thank you very much.

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

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

CHAIR STETKAR: Andrew, before we get

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

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

CHAIR STETKAR: Okay. Thank you.

MR. MAUER: Yes.

All right. So --

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

MR. MAUER: All right.

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

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

We have worked on development of a

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

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

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

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

MR. MAUER: Yes, of course.

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

MR. MAUER: Of course, absolutely.

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

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

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

MEMBER RICCARDELLA: Excuse me.

MR. MAUER: Yes sir?

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

MR. MAUER: Sure. Do you want to?

MR. RICHARDS: Sure.

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

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

MEMBER RICCARDELLA: Okay.

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

MEMBER RICCARDELLA: Okay. Thank you.

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

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

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

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

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

MEMBER RICCARDELLA: Okay.

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

MEMBER RICCARDELLA: Okay. Thank you.

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

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

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

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

A little bit of a concern is that people

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

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

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

MR. RICHARDS: So you're looking for two

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

CHAIR STETKAR: Yes.

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

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

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

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

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

MR. RICHARDS: And that is correct.

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

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

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

MR. RICHARDS: Yes.

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

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

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

MR. RICHARDS: That's correct.

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

MR. RICHARDS: That's correct.

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

MR. RICHARDS: Yes.

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

MR. RICHARDS: Right.

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

MR. RICHARDS: Right, right, and --

CHAIR STETKAR: So I --

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

CHAIR STETKAR: Okay. Thank you.

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

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

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

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

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

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

CHAIR STETKAR: Okay.

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

process --

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

MR. MAUER: Okay.

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

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

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

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

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

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

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

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

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

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

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

MEMBER RICCARDELLA: And all the rest --

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

MEMBER RICCARDELLA: All right. I

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

MR. MAUER: What do you mean?

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

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

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

MEMBER RICCARDELLA: Okay.

CHAIR STETKAR: -- a third of 70.

MEMBER RICCARDELLA: A third --

CHAIR STETKAR: Right.

MEMBER RICCARDELLA: Thank you.

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

MR. MAUER: We are not --

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

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

CHAIR STETKAR: Yes, okay, and --

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

still under development.

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

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

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

MR. MAUER: Those are just examples.

MEMBER BROWN: Oh, okay --

MR. MAUER: I am sorry --

MEMBER BROWN: -- so they're --

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

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

MR. MAUER: Sure.

MEMBER BROWN: -- what the SSE --

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

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

there's four different --

MR. MAUER: No.

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

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

MEMBER BROWN: I got it.

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

MEMBER BROWN: Thank you, I appreciate it.

MR. MAUER: Sure.

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

MR. RICHARDS: I would make one quick comment.

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

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

MR. RICHARDS: And staff.

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

Anything else for this NEI?

(No audible response.)

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

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

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

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

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

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

MR. HARDY: Glad I could help.

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

MR. HARDY: All right. Thank you.

MR. RILEY: Just so I --

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

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

CHAIR STETKAR: As little as possible.

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

PARTICIPANT: We?

MR. RILEY: Yes.

(Laughter.)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

And that's my last slide.

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

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

(Laughter.)

MEMBER SKILLMAN: You do because I will defer --

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

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

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

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

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

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

investment in FLEX, it gives us safety backup.

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

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

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

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

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

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

PARTICIPANT: 93-01.

MR. KRAFT: 93-01, thank you.

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

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

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

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

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

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

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

way to go than something in the maintenance rule?

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

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

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

MEMBER REMPE: Okay.

MR. TSCHLITZ: -- document.

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

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

argue that there is a big difference.

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

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

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

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

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

MR. RILEY: Yes.

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

MR. RILEY: Oh.

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

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

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

DR. SCHULTZ: It would not?

MR. RILEY: Would not.

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

CHAIR STETKAR: Anything more for NEI?

(No audible response.)

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

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

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

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

CHAIR STETKAR: Pardon?

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

CHAIR STETKAR: Okay.

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

is pretty low.

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

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

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

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

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

CHAIR STETKAR: Okay.

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

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

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

MR. BOWMAN: Understood.

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

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

So anything more on 1317 fuel pool level?

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

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

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

those documents include guidance on the Severe Accident Management Guidelines.

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

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

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

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

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

Are there any questions on this draft guide?

(No response.)

CHAIR STETKAR: Five seconds of silence. Proceed.

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

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

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

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

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

What are we dealing with?

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

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

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

MR. BOWMAN: Certainly.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

MR. BOWMAN: Oh yes.

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

MR. SHAMS: If I may --

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

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

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

CHAIR STETKAR: That helps.

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

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

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

CHAIR STETKAR: This is the time for us,

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

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

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

MR. SHAMS: Mohamed Shams with the staff.

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

So we welcome your feedback and questions now on them.

MR. REED: And this is Tim Reed.

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

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

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

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

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

MR. REED: Yes.

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

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

MR. REED: September.

MEMBER POWERS: -- September it looks like.

MR. REED: Yes.

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

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

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

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

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

MR. REED: Okay.

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

to bunch up.

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

CHAIR STETKAR: September is a bad month for us. And, in fact, our --

MEMBER POWERS: We can accommodate perhaps with rather than constraining it just to be in the subcommittee meeting, we add another week I suppose. We can do a lot of things but we need to know to do it.

CHAIR STETKAR: And we have some, we need to have some reasonable assurance that that week is a reasonable target week because --

MEMBER POWERS: Exactly so.

CHAIR STETKAR: -- because if we do it and then it ends up canceling.

MEMBER POWERS: It will be January. Guarantee you it will end up being January.

CHAIR STETKAR: We're going to run long. I have a couple of other constraints that I need to take care of, so let's get into DG 13-01.

MR. BOWMAN: Okay. The one other thing I wanted to mention about DG 13-01, the process of putting out DG 13-01 was happening in parallel with a revision to JLD-ISG-2012-01 that took place in January. So the most current version of the

guidance for satisfying the requirements of Order EA 12-049 is the ISG rather than the draft guide.

So building from the changes that happened between the Revision 0 or the ISG to Revision 1 is a better place to start than to look at what was published as the draft regulatory guide. The intent in both is to incorporate the acceptable alternative approaches that have been proposed by industry for complying with the order and approved by the staff, as well as resolving all the lessons learned in the implementation so far.

And with that, if you don't have any further questions, that completes my presentation.

MR. REED: Five seconds.

CHAIR STETKAR: There is -- I have a few actually. And let me just march through mine then we'll see who else has.

You've basically endorsed Appendix E to 12-06, Rev. 2. If you heard some of the discussion that we had with the industry, Appendix E now focuses on confirming the feasibility of personnel actions. It does not address the reliability.

However, as Appendix E will be applied as we go toward the focused assessments of now more narrowly-defined seismic and flooding scenarios, if

you will, there are, especially in the flooding area right now the way the guidance is written, the need to demonstrate confidence in both feasibility and reliability for events that are judged to have higher frequencies of occurrence, if you will.

How does the staff now develop confidence in the reliability of human performance for implementing those strategies if all I have is a demonstration that they're feasible? It is in fact feasible for me to drive from here to San Francisco within some defined period of time. I might not at all be very reliable by the time I get to the end of it because I might be sleep deprived.

So how are you addressing that notion if you're just addressing feasibility without any assessment of uncertainty, without any assessment of how large are the available margins to account for uncertainty or as a surrogate for reliability?

MR. BOWMAN: The way we approached the Appendix E in the validation of the actions necessary for the mitigating strategies is it was based on the Order EA 12-049 being an undefined situation that is not amenable for defining what the personnel performance factors would be for human reliability analysis.

So we acknowledged from the get-go that we aren't going to be able to get a good, defensible judgment that a set of actions was reliable for all of the circumstances under which the actions could potentially be required.

As a result, Appendix E, we're unwilling to go beyond saying that it will indeed get you a determination that a set of actions is feasible.

That being said, though, what you will get is a collection of information in a report that shows the time margins available for all of the constituent tasks and also in Section E.65 of Appendix E requires an integrated review to go through and look at the confidence that there is in the validation, so looking at the overall performability without characterizing it as being something that would be reliable.

And given that, and the other outcomes you get with the integrated review are you avoid the circumstance of potential double counting of staff or equipment that could take place just looking at it as a piecemeal individual test where feasible. We wanted to have confidence that the staff, as it exists on the point of time the event is postulated to take place, could perform the actions reasonably,

taking into account things like consequences of sub-optimal performance. If it takes a little bit longer to strip loads off a battery, what's the downstream effect going to be?

And anyway, what the industry is developing is technical reports that include the event being submitted but retained on site. Generally there are technical reports on the validation that include the degrees of margin they have to the time necessary to perform the individual actions.

In the Flooding Action Plan that was sent to the Commission in COMSECY-15-19 and approved in the SRM we did point to the use of engineering judgment -- and I would term it more broadly engineering and operational judgement -- to take into account the likelihood of a flooding event, recognizing that we don't have a broadly technically acceptable method of determining flooding frequencies of exceedance for all of the flood mechanisms, and balance that with the degree to which a licensee has been able to demonstrate the goodness of their validation of the strategies.

And I use the term "goodness" because I'm not willing to use the term "reliable" to

describe what the results are. In my view you either get a feasible determination or you follow something like the NUREG-1852 process and as it was also translated in the integrated assessment guidance that was in JLD-ISG-2012-05, Appendix C, that could get you a reliability determination.

I don't believe that the guidance we have out there in Appendix E is suitable for saying that it will indeed satisfy all the requirements to be called reliable. But on the other hand, I don't believe that the hazard that's been demonstrated through the determination of the risk that's postulated by these flooding mechanisms and the events that could happen with the flooding would be sufficiently high or sufficiently certain to warrant a further demonstration of reliability.

CHAIR STETKAR: That was a long answer. We'll talk about this more this afternoon when we have a little more time. You may want to rethink your answer.

The basic strategy is that for certain events that remain bounded by the current strategy and the design basis I don't need to do anything. For other events that have a relatively higher frequency of occurrence I need to demonstrate

feasibility and reliability. And the NEI guidance when I look at those piece parts hardware has guidance about how to determine that the piece parts hardware are reliable and available, not so much for humans.

For the ones that are judged to have lower frequency of occurrence I only need to demonstrate feasibility of the human actions. The same guidance applies for the piece parts hardware. And I'll just stick to that approach. And I will tell you that the staff's endorsement of just saying that something is feasible but implicitly it's reliable doesn't play out with human performance. And we have ample evidence to show that.

So we'll talk about it more this afternoon because that's yet another set of guidance that's all part of this stew here. But by endorsing in DG 13-01 verbatim Appendix E, without any statement about how it may or may not apply to developing confidence on the reliability of human performance for those focused strategies, that may be a shortcoming, especially considering that there is published Nuclear Regulatory Commission guidance on how to account for the stuff that's in Appendix E to evaluate some confidence in the reliability of

performance. It's not something that needs to be created out of whole cloth.

So we'll discuss that more this afternoon as we focus on those particular flooding points.

The staff has endorsed the notion, and we discussed this in the past, that if I have a multi-unit site -- and for simplicity I will say it's a two unit site -- that the N plus 1 strategy of equipment in NEI 12-06 can be satisfied by having two pumps, each of which are big enough to supply all of the cooling water needs for both units, so that I have N is a big pump and plus 1 is another big pump.

Okay, we've discussed that philosophy in the past. ACRS lost. Given that, and now looking at how people are doing their assessment, we heard the discussion this morning, can I now get into a situation where because of the focused assessment process people are going to say I'm going to protect this set for flooding, but not seismic. I'm going to protect this set for seismic, but not flooding. Because I don't have to consider seismic and flooding together. And, therefore, I followed all of the rules.

I have N. I've counted N plus 1. I've not had to consider anything else. And yet when we get the event, it's not protected.

Again because, remember, the original principle was that FLEX was supposed to be diverse and flexible coping for an undefined event. And we're suddenly now making it, well, it's not diverse and flexible for this particular event, but it's diverse enough and kind of flexible enough for this particular event. And it's differently diverse and differently kind of flexible for this other particular event. And for other things maybe it's kind of diverse and flexible enough. Maybe, but we don't know.

MR. BOWMAN: I understand your concerns, and particularly the seismically-induced flooding concern. We talked about it a little bit yesterday. And I wanted to point out to you a couple of things that are in the guidance in NEI 12-06.

In Section 3.2.1.3 that sets the initial conditions for the event, Item Number 9 is that "No additional events or failures are assumed to occur immediately prior to or during the event, including security events."

And then in the guidance on the reactor

transient, 3.2.1.4, Item Number 4, "No independent failures, other than those causing the ELAP/LUHS" -- loss of ultimate heat sink event -- "are assumed to occur in the course of the transient." That allows for consideration of the occurrence of consequential failures.

And for the sites for which there is a potential for consequential failures, like an upstream dam failing due to a seismic event causing a flood, the sites that have that have taken it into account.

A colleague of mine pointed out two additional sets besides the two I mentioned yesterday. The individuals we've talked to here, it's not a problem for Arizona Public Service.

CHAIR STETKAR: No, it's I don't want to --

MR. BOWMAN: But the sites where it is a problem, they did look at it, so.

CHAIR STETKAR: Eric, my concern is, I mentioned earlier, the ACRS is not in the business of looking at 70-some-odd site-specific analyses and providing comment. That's not what we do. We look at bigger picture stuff.

I'm looking at the bigger picture stuff

and saying are there gaps in the bigger picture stuff that people can use to their advantage to say that we complied with NEI guidance that's been given to me as a utility and that, indeed, there's nothing in staff review guidance, regulatory guidance that says I have to do anything more. And, therefore, I satisfy everything. So, therefore, the staff should accept my proposed strategies.

That's the level I'm dealing with. You know, I've been using seismic-induced flooding because we've walked ourselves into seismic and flooding and ELAPs and LUHSs and all of those things. But I'm trying to keep it at a level that says are we inadvertently walking ourselves into a style -- an effective stylized design-basis approach to looking at these things, which was not the original intent of the whole process?

And the more that you look at an individual hazard and an individual scenario and say I'm protected against that, but nobody told me that I had to think about something else, the more we depart from that, that basic notion of what the industry proposed as a diverse and flexible strategy.

So, again, I'm using seismic-induced

flooding as a surrogate but it's one I can at least point to. And I've heard feedback -- we heard it this morning -- that, no, people don't have to consider that. Now you're saying, well, there might not be any sites that have that particular confluence of things because the dam might be far enough away. Or, the ones that do already think, fine. What's the other thing that they're not thinking about?

DR. SCHULTZ: And just to amplify that point, too, John, is that, you know, as we talk about it here, and NEI is here, and staff is talking about how this is going to work, and we may, we may cover everything nicely now but unless the guidance is properly written --

CHAIR STETKAR: Yes.

DR. SCHULTZ: -- 10 or 15 years from now these holes or opportunities that we talk about in, if you will, the next generation of analysts or decision-makers at the sites, you know, things, things can change --

CHAIR STETKAR: If it's not written.

DR. SCHULTZ: -- unless it's clearly written as to what we will be accomplishing what we set out to do.

CHAIR STETKAR: Everything sounds good orally. But the staff reviewer who raises the question a year-and-a-half from now about somebody's submitted assessment says, Hey, you didn't consider this. And suddenly the licensee says, Well, I wasn't forced to consider it. And, you know, 600 RAIs get written and it marches up the management chains. It's counterproductive.

MR. REED: I would just, I by the way completely agree with what you're saying. In fact, what we're trying to achieve in the final rule is crystal clear requirements for the crystal clear supporting section by section saying what they mean and intend and what the guidance is. Okay. So it's all clear 10 years down the road an inspector, anybody else comes along, they know exactly what they mean.

And that's the exact objective we're shooting for. That's what you try to do. So we're trying to shoot for that goal. So I'm agreeing with the principles.

CHAIR STETKAR: You know, I heard what you read, the excerpts from the 12-06. One oral interpretation of those excerpts is the way you characterized it, that they don't exclude

consequential events.

Another oral interpretation is, no, those are independent, seismic and flooding is independent.

The staff, you know, the staff can quickly elaborate, you know, in their guidance about you do have to consider consequential events.

MR. REED: Okay.

CHAIR STETKAR: It doesn't take a lot or wording. It's not our business to write draft regulatory guidance either. We're just, it's a subcommittee meeting. These are individual comments. It isn't an ACRS position. Have to say that on the record.

MR. REED: Okay.

CHAIR STETKAR: Another comment. Take a look at -- and this is just a, I think and I hope it's just a typo -- take a look at your Section 6.1.2 where you're talking about alternate mitigating strategies, in particular this is under seismic events, and it looks like you copied words from flooding that didn't -- don't necessarily apply to seismic because you talk about exhaustion of fuel for operating emergency power sources.

And I get why that applies if I'm

flooding underground fuel storage --

MR. BOWMAN: Is that in the draft guidance?

CHAIR STETKAR: It's in DG 13-01, the one that's there.

MR. BOWMAN: That wording has been removed from the JLD-ISG which is a more current version of the wording.

CHAIR STETKAR: Okay.

MR. BOWMAN: It's been adjusted.

CHAIR STETKAR: Okay.

MR. BOWMAN: Granted it's a moving target.

CHAIR STETKAR: Okay. Just the only reason I brought it up is if there was something subtle that I was missing in terms of the intent, I wanted to kind of dredge that up. But if it's wording, that's fine.

Let's talk about -- I don't want to talk about Appendix H.5, or Path 5, unless any of the members want to talk about that. And it's, we can because there is just stuff written in DG 13-01 on it.

I'll let the industry off the hook a little bit on the IPEEE models which are not Path 5,

they're Path 3, because they said, Well, the staff has approved all that.

So let's talk about staff approval. So, Path 3 says I can take my IPEEE models and do some sort of comparison and figure out that I'm okay. Educate me on what those approved IPEEE models are. The staff said, well, they're -- or, I'm sorry, the industry said there are seven or eight sites that are eligible to use this approach. So the eligibility must have been determined by some staff acceptance.

What does that acceptance mean? And in particular I'm looking at the technical scope level of detail of the IPEEE models; how those models accurately represent the currently as-built, as-maintained, as-operated plant compared to what it looked like in the late 1980s. And --

MR. BOWMAN: Okay, so --

CHAIR STETKAR: And how seismic failures were treated in those models, in particular to develop the so-called plant-level HCLPF. Does that only account for seismic failures that result in core damage? Or does it also include any core combination of seismic/non-seismic human errors that contribute to core damage?

MR. BOWMAN: I'm going to phone a friend on this answer to this. I've got on the line Mo Shams.

But one thing I did want to point out, for the number of plants and the identification of the individual plants that are eligible for Path 3 or Path 4 in Appendix H, in the ISG we've listed specifically which plants are eligible for which of the individual Paths. So --

CHAIR STETKAR: Good. And, again, we're ACRS, we don't get into looking at --

MR. BOWMAN: Oh, I understand.

CHAIR STETKAR: -- that level of detail.

MR. BOWMAN: But that gives you the numbers for which ones they are.

CHAIR STETKAR: Fine.

MR. SHAMS: So this is Mohamed Shams with the staff.

So as part of the 5054(f) letter regarding the reevaluation of the seismic hazard at the sites, the staff looked at what sites have done in the past. And IPEEE was one of the major studies that the industry had forwarded as that's work that demonstrated margin in the facilities. And they indicated that they would like to leverage, you

know, that work.

So in developing the guidance for how we would carry forward the reevaluated hazard or how we would screen sites for further risk evaluation, we took advantage of those sites that did a full scope IPEEE.

There were a number of scopes for the IPEEE. Some sites looked at more reduced scopes. Some sites have done a -- without perhaps, you know, solar evaluations or, you know, other aspects of the evaluation.

So in developing the guidance we said that those that have done full scope IPEEE, which included two shutdown Paths and other relevant failure modes, as you indicated in the question, did we take human factors, that was part of the consideration when a licensee described their response to the hazard.

So to the main, the main aspect to say is everybody had submitted an IPEEE, but not all were of the right scope or the right pedigree that had been accepted for this test. That's the reason that only seven or eight or a handful was accepted.

In terms of what was missing, the question alluded to what was the pedigree or what

was missing and how are we treating that today, we also augmented our approval of the IPEEE with a couple of other aspects. If there was exceedance in the high frequency range we know that has not been looked at and we required the licensee to further look into the plant response in that area.

Another area that we also had indicated as an area to augment what was done for the IPEEE is the spent fuel pool area as well. So if there was an exceedance in the range important to the spent fuel pools we had them look at that as well.

Again that, you know, that -- I'll just pause here and --

CHAIR STETKAR: Okay. When, just for the record, were the IPEEEs submitted? Just ballpark time.

MR. SHAMS: Ballpark time, it was in the late '90s, early 2000.

CHAIR STETKAR: Okay. So they reflect, ostensibly, the configuration of a plant something on the order of 20 years ago.

MR. SHAMS: It is fair to say that. But I should add that part of the submittal of the IPEEE this time around had -- I'm sorry, I shouldn't say that. I should say part of the approval for the

IPEEE this time around is to have confirmed that any vulnerabilities that were identified at the time, any fixes that needed to be done were also considered and implemented. Had a licensee significantly changed the configuration of the plant in a meaningful way, I would venture that the IPEEE at this point would certainly not be appropriately --

CHAIR STETKAR: But, see, I hear those words aurally in this environment. I'm asking you what specific efforts did the staff make to confirm that whatever was being presented to the staff now in 2016 or '15 or whenever it was, for '14, I don't care --

MR. SHAMS: Right.

CHAIR STETKAR: -- whenever it was presented accurately represents the current plant and could be used to evaluate the current plant vulnerabilities to the seismic events that are currently being evaluated for that plant, not the seismic events that were evaluated in the middle '90s to the plant that existed in the middle '90s, for the purposes of those assessments which were a course assessment to identify seismic vulnerabilities and not necessarily seismically-

induced events that could be important to plant safety? It's a different focus.

So I'm asking you now what efforts did the staff make to have confidence that those things that are being proposed are reasonable to use today?

MR. SHAMS: I would say two parts: one that I offered already that we've required that licensees identify or confirm that licensees have addressed the vulnerabilities that were identified. That was one piece.

The second piece --

CHAIR STETKAR: Well, let me interject here.

MR. SHAMS: Right.

CHAIR STETKAR: Twenty years ago I had an old beater Toyota.

MR. SHAMS: Right.

CHAIR STETKAR: I used to replace its water pump. I did that. It was good.

You know, I don't have that car anymore.

MR. SHAMS: Right.

CHAIR STETKAR: I don't have that issue. So, fine, they fixed that. But it may not be applicable anymore.

MR. SHAMS: Okay. Allow me. The second

piece is coming.

CHAIR STETKAR: Yes, okay.

MR. SHAMS: Early on in Fukushima the staff did a walk-down to confirm that the licensees continued to have the appropriate arrangement and appropriate configuration to meet the current licensing basis. So the point is only a couple years ago it was confirmed that the plant meets its current licensing basis.

So what the IPEEE offers is a margin based on meeting that current licensing basis. And that's the idea is if we walk the plant we make sure that they don't have two over one issues, we make sure they have no degraded features in there. And whatever vulnerability that was identified was taken care of. So we established the baseline. And then from there the math gets us to the margin.

That's the point I wanted to get to.

CHAIR STETKAR: Okay, that one helps.

When plants submitted an IPEEE, and as a surrogate they submitted a plant-level HCLPF.

MR. SHAMS: Yes.

CHAIR STETKAR: High Confidence of Low Probability of Failure, for the record. Just I use acronyms.

Did that value that's now being used as a basis for determining margin account only for seismic failures that resulted in core damage?

So, for example, a seismic event destroys offsite power and destroys the diesel generators and, and the batteries let's say. That's a seismic event that will lead to core damage directly, if nothing else.

Or, did those HCLPF capacities count as a surrogate somehow -- and I don't know how they would -- for the fact that a seismically-induced loss of offsite power could involve independent failures of the diesels, independent failures of human actions, and eventually result in core damage, but that's not seismically-induced core damage, it's something that resulted from a seismic initiating event?

The margin that you calculate is much different given the two because the things that are direct seismic contributors to core damage tend to be really, really bad earthquake events. And our results of full scope risk assessments have shown that most of the risk doesn't come from really, really, really infrequent, very bad earthquake events, it comes from kind of more frequent,

moderate acceleration with combinations of things.

So do you know whether those HCLPF capacities that were reported in the IPEEEs accounted for the full scope or just seismic failures?

MR. SHAMS: In a yes or no answer I would say, yes, it did account. To what rigor, obviously I don't have the full view of that.

But I could offer just so the way the IPEEE was carried out is the licensees -- it will take just 10 seconds -- the licensees had identified a success Path. And the HCLPF represented the minimum, if you would, failure capacity at a plant level for that Path.

Part of the staff review went into the actions. And there are some licensees -- that human actions associated and other activities -- and there are some licensees in exchange with the staff were told that there is too much reliance on human action in that response, this is not particularly appropriate. So I'm going to just elaborate on my point that there was a degree of review of the human actions in an exchange between the staff and the licensees on that.

CHAIR STETKAR: Okay. Let me, let me --

I have another constraint here. And what I'd like to do is I don't want to end the conversation because there may be other comments, but Ed Lyman we have a time slot. He has a time constraint. And I want to make sure Ed has enough time because of his time constraints to actually make the comments that he wanted to do.

So with the agreement of the subcommittee what I'd like to do is put a stop to this discussion and make sure we get Ed's comments on the record. And then we'll come back, finish up this discussion and then I'll ask for more public comments. I'm sorry, I just have to deal with the times.

So, Ed, I understand you have some comments that you wanted to present to the subcommittee. And do so.

MR. LYMAN: Okay, so I have five minutes; right? So --

CHAIR STETKAR: Take as long as you want or need.

MR. LYMAN: Well, I'm not really prepared to, I didn't prepare any slides today. But and we do have, UCS did submit some written comments on the draft rule. These don't really embody all

our criticisms of the rule based on our own resource and time constraints. And so I'm not going to really go over these in detail since you can read them.

But I would say that the big picture is that we have -- this rule gives the opportunity to fix some of the problems that have arisen in the starting with the mitigating strategies order and the various iterations of the guidance to meet that order. In our view that fundamental, that initial cut dealing with the Fukushima problem as embodied by the mitigating strategies order has serious inconsistencies. And the process seems to be hollow at the core.

And I think the discussion this morning really illustrates that. I think the core issue is the sum total of everything that has been done to address the essential issue of beyond-design-basis events that can cause a loss of alternating current power is the sum total of all that that's been done, does it add up to more than zero?

And in our view it's really not clear at this point that it does because of the stylized artificial nature of the initial event, which I think is a cause of a lot of the problem and

confusion that has persisted for the last five years. And these issues are not new; we've been talking about them for a long time. And they don't seem to really get closer to resolution.

So the one thing I would point out from our comments is that the draft rule even gets, it gets even worse than the mitigating strategies order. It's not just a codification but it's making things more vague. And so this reliance on a performance-based standard that backs away from even a 3-phase structure of the -- that was recommended by the Near Term Task Force and implemented in the order, the fact that we no longer have a defined 3-phase structure I think makes things even more confusing.

And we think that that retreat gives way too much latitude to the licensees. That there should be at least a well-defined minimum duration for Phase 1 and Phase 2 so that the public can understand what the licensees are capable and committed to doing. Because it's common sense that if they're going to have portable and other equipment that's going to be part of the FLEX strategy, that they need to know how long they have to be able to set up that equipment and install it

and have it become operable.

And there should be a well-defined minimum time that every licensee will have to adhere to. And that's something I think the public can understand. And retreating from that just I think was a big mistake.

I haven't reviewed all the tricks, plans, but the ones I've looked, I haven't seen anywhere the Phase 1 duration approaches the 8 hours that the Near Term Task Force originally specified in its recommendation. And without having at least something like an 8-hour margin, we actually recommend a much longer one. We think based on the Fukushima experience that you should have 24 hours of you should be able to cope with an installed system for 24 hours because it took them nearly that much time to establish reliable injection, emergency injection.

But even 8 hours I haven't seen a single plan that actually complies with that. And then you are running into the issue of what is adequate margin and does what they're doing to provide adequate margin. And adequate margin is also not defined.

So, so again this performance-based

standard, backing away from any kind of prescriptive requirements just I think makes it much harder to understand what's going on.

And to deal with the issue of this amorphous event where you don't understand what causes it, it could be anything, but it causes this extended loss of A/C power, that you don't have to consider how that happened, and to carry through the events that caused that in any consistent way makes this exercise, again, very confusing. And so we've recommended here, here before and before the Commission that the way to solve this problem or to address it is to have a scenario-based, you know, stress test approach to the system where you can't, you know, you can't protect against everything but at least if this notion is predicated to FLEX and protect against almost anything that you throw at it, then you have a tool to, inspector should have a kit of scenarios where they can evaluate what is presented to them and play those out.

So if it's a seismically-induced flooding event, then you consider the impact of the earthquake on the site. Whatever happens you do it like a PRA where each step you'll decide based on the conditions, what you have and what you don't

have, and you do it logically and systematically. And you do that for a variety of scenarios that may be chosen at random from a larger set. And that would provide at least some measure of confidence that I don't think the process has now.

And so without the draft, without the rule having some sort of validation process based on something like that, we think it misses the opportunity to really address the issue, of addressing the Fukushima lessons learned appropriately, so.

MEMBER POWERS: Ed, you said the words "don't really know what caused it or where, what it is." You're speaking of an advance. I don't know -- When it actually occurs I'd pretty well know.

MR. LYMAN: But even if you -- well, no, I'm talking about the mitigating strategies order which says that some unspecified beyond-design-basis event causes an ELAP and a loss of heat sink. But that undefined event does not have to be propagated through, so you don't have to consider, well, what caused it? Was it a flooding event that caused the, you know, short circuit? Or was it -- you know, you don't have to specify that event. And then have a consistent scenario where you look at all the

impacts of that event.

So, and so that allowed the industry to come up with the guidance that said we can consider everything else to be design-basis essentially; right? We don't have to, even if it is a beyond-design-basis external event, the only impact it had was to cause the extended loss of A/C power and the loss of heat sink, but it would have no other impacts at the site that were beyond-design-basis. That's what the lack of specificity or the confusion in that original order led to.

So it allows these, these inconsistent scenarios to play out where you don't have to consider -- you don't have to consider simultaneous events like seismic and flooding, even though that may have been a logical origin for your problem. And so we're just saying you should play out, you know, you should have a set of scenarios and you should just play out exactly the damage states that they will cause. And you look at all the equipment, all the human performance issues, and you do that consistently. And that's the only way to get an answer to say is this feasible and is it reliable?

So that's the basic point.

CHAIR STETKAR: Any other comments or

questions for Ed?

(No response.)

CHAIR STETKAR: Ed, thanks a lot. Appreciate it. And hope you make your appointment.

MR. LYMAN: Not too bad.

CHAIR STETKAR: Thank you very much.

And we'll go back now to making the staff's lives as collectively uncomfortable as we can.

I don't have any more comments on DG 13-01, with the caveat that I'm not going to try to talk about Path 5 today because we're going to have the opportunity to discuss that with NEI in terms of their guidance. So I'm just leaving that on the table until we revisit it because I don't know what they're going to come up with there.

MEMBER POWERS: I did not -- the earlier presentation, there was kind of an abbreviated mention of human reliability --

CHAIR STETKAR: Yeah.

MEMBER POWERS: -- and challenges there. And I didn't follow the argument that was being made at all. Maybe we could reproduce it.

CHAIR STETKAR: And because Dennis wasn't here, and I hate to do this but because he's

kind of interested in this stuff.

What I asked the staff is that they've endorsed a certain number of plants for which the IPEEE can be used in this process for a so-called Path 3 evaluation of seismic events. And what I was challenging them is how well those IPEEE submittals first of all account for the currently operated plant. And, in particular, let's presume that it does, there's an awful lot of discussion in the guidance about using the IPEEE-generated plant-level HCLPF capacity, High-Confidence of Low Probability of Failure, as a measure of margin against the reevaluated seismic hazard.

Now, I get that concept. But it's really important to understand what that HCLPF capacity accounts for. Because if it only accounts for seismic events that are strong enough by themselves to directly cause core damage, that, that is one value.

If it accounts for a surrogate capacity for the conditional core damage probability from any seismic event, that's a much different value, if it accounts for, somehow, hardware failures and, in particular, human actions.

So that's how we got into that

discussion.

MEMBER BLEY: I heard a little bit of that.

CHAIR STETKAR: You did. Okay.

MEMBER BLEY: Only the hardware part.

CHAIR STETKAR: And Dana's right, the discussion of human was not well-elaborated. So let's ask Mo again now about the human side of that.

MR. SHAMS: Sure.

So in response, I, looking back at the HCLPF what it represents. So as I mentioned, each licensee selected a success path essentially, a path to be able to shut down the reactor safely, and developed a seismic margin, a minimum seismic margin for that, for that path. And that represented a seismic event that the plant, there is a reasonable level of confidence that the plant would survive.

MEMBER BLEY: That's better than reasonable. But go ahead.

MR. SHAMS: Thank you.

And in terms of the human actions associated with that, I responded that the staff did look at the degree at which licensees are relying on human actions in carrying out that success path. And there were comments, there were feedback

provided when there were too many of them or unreasonable level of reliance on human action. So to that degree I responded back that the human actions were, were considered and were addressed in, you know, in the staff's evaluation of what the licensees have done for the IPEEE.

And I put all that in a final package, if you would, that only very few that we're allowing to use the IPEEE, those that we have confidence in their overall approach, the math associated with the HCLPF calculations as well as the human path actions used also the scope, the overall scope of the study itself was the appropriate one. I mentioned earlier there were a number of scopes, licensees selected, full scope versus other reduced scopes.

So, so that's how I responded to the question.

MEMBER RAY: John or Dennis, I guess I thought we were talking about the seismic reevaluation associated with mitigating FLEX equipment, not the plant itself. But when I hear John talk just now and asking the question that was just responded to, it sounds like we're talking about the plant.

Help me understand what.

CHAIR STETKAR: We'll ask the staff. That's one of the questions that I had is now people seem to be retrenching and saying, Ah, even if I didn't have FLEX at all, I flushed FLEX down the drain, my plant as I evaluated it under IPEEE could have coped with the reevaluated seismic hazard, so I don't need to go look to even see whether FLEX will survive.

MEMBER RAY: And it was because of that that I stumbled around earlier trying to figure out are we trying to ask any questions we have about that now?

CHAIR STETKAR: Yes, absolutely.

MEMBER RAY: Because I didn't anticipate that. And so I'm not ready to.

But in other words, I'm not thinking -- I thought we were focused, like I say, on FLEX equipment and its ability to withstand the increased seismic event.

MEMBER RICCARDELLA: Equipment management strategy.

CHAIR STETKAR: Let's first of all because Dana brought up the itch about human performance, did it get scratched well enough for you? Because we're going to diverge here away from

that topic a bit.

MEMBER POWERS: Well, my note said that they had troubles analyzing human reliability in these extreme circumstances and whatnot. And when I, the trouble with being old is I go back to Alan Swain when he was setting up the Human Reliability Handbook, and his whole objective was, gee, under stress circumstances how well do people perform? And so he seemed to be specifically addressing the chaotic circumstance in his thinking. And so I said, gee, that's what Alan Swain was trying to do.

And it's true that you probably can't do it very well, but you can do something.

MEMBER BLEY: Well, I came in late on this. Are we talking about the effect at the HCLPF or the effect of the earthquake that really does damage?

MEMBER POWERS: I got the impression --

MEMBER BLEY: Because if it's a HCLPF it's no big deal. It's not this --

MEMBER POWERS: I got the impression that what they were, what they were looking at was what is the reliability of bringing the FLEX equipment on board and bridging the gap between the time you have and don't have the flexibility.

CHAIR STETKAR: That gets, that starts to get into though what Harold thought up, and I'll try to elaborate a little bit more. Let me ask this first, then we can come back to human performance then.

It's my impression, and I might be wrong so I want help on this, it's my impression that a so-called Path 3 evaluation where people are going to use the IPEEE is answering the question can the plant adequately -- can the plant demonstrate that it can maintain adequate safety, given the reevaluated seismic hazard, with no consideration whatsoever of FLEX?

MR. BOWMAN: That pretty much is what it is.

CHAIR STETKAR: Okay.

MR. BOWMAN: Similar to the flooding area, what is termed the ultimate mitigating strategies is a demonstration that there is a ability for the plant to achieve a safe and stable state, whether it's with the FLEX equipment or with the plant equipment --

CHAIR STETKAR: Okay.

MR. BOWMAN: -- without considering the existence of an ELAP, unless the ELAP is caused by

the event.

CHAIR STETKAR: The difference though, as I read it -- and this is interpretation, personal interpretation -- is when I look at the guidance for flooding for ultimate mitigating strategies, that guidance doesn't say using only plant equipment or using only FLEX equipment, it says reevaluate everything. And if part of that alternate mitigating strategy is that I have to go haul my FLEX pump up on the plateau, that's fine. That's an alternate mitigating strategy for that particular flooding mechanism.

When I go to seismic, in particular to Path 3 because it only relies on IPEEE -- and don't, I know the spent fuel pool, I know the high frequency -- but it relies now on only in-plant equipment. I can dynamite the FLEX equipment and still pass a Path 3 evaluation. Is that correct?

MR. BOWMAN: It may be. However, there may be a need for some of the FLEX equipment for doing things like the refueling the emergency diesel generators or things like that.

MEMBER RAY: But is that then the end of the subject of evaluating the plant's ability to -- I mean it's essentially changing the design basis it

seems to me is what happens when you end with that. Now, to say we don't need the FLEX equipment, that's one thing. To say -- and that's fine. And we don't need to do anything more. That's really what I'm asking.

MR. SHAMS: Perhaps if I may, I don't think that Path 3 is saying that we don't need FLEX equipment. I believe that Path 3, as Eric indicated -- and I'll just back up for just a second here to describe a little bit more philosophy.

So mitigating strategies are already designed and many -- when I say mitigating strategies I say FLEX equipment, are already designed and installed for the great majority of the sites. So the exercise with looking at the impact of the reevaluated hazard on this is essentially one of is a modification warranted? And looking at a number of options, flood --

MEMBER RAY: Excuse me for interrupting. But is a modification required in the FLEX equipment?

MR. SHAMS: Correct.

MEMBER RAY: And that's all?

MR. SHAMS: For the plant equipment for that --

MEMBER RAY: Well, all right. And that's the addition of order in the plant equipment is what I'm hung up over. So let's just, I'll stop there.

MR. SHAMS: But the first phase of FLEX is plant equipment. So we're looking at an entire package that's three phases, part of which is plant equipment, part of which is portable. So the exercise, again, is to assess whether or not a modification is warranted.

And Path 3 is one that says if I can demonstrate that the plant equipment can survive indefinitely, I don't particularly need to examine the need to modify the FLEX, the portable FLEX.

MEMBER RICCARDELLA: To me there's a huge different between Path 3 and the other four, the other four paths. Because we got into this because the FLEX equipment is designed to SSE, and the other four Paths also. Well, what do I do if that SSE assumption isn't right? And, you know, that all makes sense. But the plant equipment -- the FLEX equipment wasn't designed for the IPEEE spectrum.

So now we're going with this, I guess what you call this alternating, this alternate

mitigating strategy that says, well, I don't -- I agree with John -- it says, well, I don't need the FLEX equipment. Or if I do, I'm going to go back and re-qualify that FLEX equipment that I need to a higher spectrum.

MR. SHAMS: If I may respond. So the first phase of FLEX is plant equipment. And it was designed to SSE. And what Path 3 provides or the IPEEE provides the inherent margin in that phase 1 FLEX.

MEMBER RICCARDELLA: Right.

MR. SHAMS: And it says that it actually has the capacity to address the reevaluated hazard.

MEMBER RICCARDELLA: Okay.

MR. SHAMS: And then the caveat we've added in addition to that is actually can the plant go indefinitely on that phase alone. And that's the ultimate outcome of Path 3. It should be able to -- and you'll see some caveats related to spent fuel pool about ensuring that there's a portable pump or whatnot stored properly to be able to withstand that hazard, so.

MEMBER RICCARDELLA: And what's the nexus between that Path 3 evaluation and the 2.1 evaluations that are ongoing? I mean aren't they

doing largely the same thing? The 2.1 evaluation should qualify all that plant equipment.

MR. SHAMS: It's essentially for the same plant that would be the same evaluation. Because, you know, for the 2.1 evaluation after the hazard was addressed the question became do I need to do a risk assessment? And given the inherent margin in the plant equipment the answer becomes no. And that closes that aspect.

And then just to answer the question for how about the mitigating strategies, are they adequate, appropriate or can be implemented for the reevaluated hazard? The same logic now if we can use the capacity and demonstrate that phase 1 is capable, then that answers the question as well.

MEMBER RICCARDELLA: Is IPEEE one of the paths being used in the 2.1 evaluation?

MR. SHAMS: It is. It is a --

MEMBER RICCARDELLA: Presumably it's the same plant.

MR. SHAMS: Absolutely.

MEMBER RICCARDELLA: The same three or four plants.

MR. SHAMS: For the same few plants, yeah.

MR. BOWMAN: If it helps, we did not willy-nilly require all the licensees to do all the same things for all the same hazards because we recognized that there's a site-specific element to the hazards that are applicable to a site. And in NEI 12-06 when it came in originally there's an appendix, Appendix B, that has a discussion about screening out of different hazards for the different sites were it to take place, based in large part on what the site-specific nature of the hazard at that site was.

That's why we don't have guys running around with flight jackets on at Palo Verde, just as a fairly facetious example. And we are not concerned about snow plows at Turkey Point.

On the other hand, in NEI 12-06 we made the seismic hazard applicable to all sites. This is effectively extending a screening process, if you will, similar to the Appendix B screening process, to see do we need to do something more for the FLEX mitigating strategies that were developed under EA-12-049 using NEI 12-06 for licensees that have sufficient IPEEE HCLPF capacity that they can demonstrate they've got a safe shutdown path or two safe shutdown paths that would last for a

sufficiently long time.

MR. TSCHLITZ: So this is Mike Tschlitz from NEI.

I would just like to provide a little perspective from the industry because I was involved with developing the five paths in the NEI guidance document.

And I would say that I think the part that I think is misunderstood here is that even though Path 3 doesn't go through the rigorous analysis of the FLEX equipment, I would offer the fact that since the existing phase 1 equipment is primarily installed plant equipment, and that is going to have to be relied upon in the IPEEE, and your IPEEE showed that for a seismic hazard that's greater than the reevaluated hazard, the plant has adequate capacity to withstand that and remain operable. So beyond that you also have phase 2 and phase 3 FLEX equipment. And I think the presumption in NEI 12-06 is after 24 hours you can bring in offsite resources to bear.

So the question became was it really warranted to perform a rigorous, detailed analysis when you had shown all this capacity, and still the capacity to bring in offsite equipment from the

national response centers with the likelihood that the outside equipment would still be there and available, so what degree do you have to prove this to have assurance?

And I think the staff was responsible and the decision was made is, you know, we don't need to dedicate a lot of resources to this because there's a lot of success paths here. And the IPEEE already showed that the plant design was robust.

So I would say don't over-discount the capability of FLEX, even though it's not specifically analyzed for Path 3.

MEMBER RICCARDELLA: But so you're saying all you would discount is the phase 2 approach because that's not qualified for the IPEEE seismic; right?

MR. TSCHLITZ: No, I wouldn't --

MEMBER RICCARDELLA: You'd still have the phase -- you'd have the phase 1 and the phase 3 but not the phase 2.

MR. TSCHLITZ: I would not necessarily discount any of it. I would just say --

MEMBER RICCARDELLA: Well.

MR. TSCHLITZ: -- the fact that it hasn't been analyzed down to, you know, developing

first for the FLEX storage structure and spending millions of dollars doing an analysis of whether that survives a new hazard, is that really money well spent as far as safety benefits?

MEMBER RICCARDELLA: I'm not being critical, I'm just trying to understand.

CHAIR STETKAR: Well but, Mike, you had to spend millions, you had to spend millions of dollars to provide some assurance that it is robust, whatever that means, based on the existing safe shutdown earthquake. So are you saying is that the industry gambled and said it was good enough for the current design basis and you decided not to reevaluate it for the reevaluated hazard?

That was the risk that you took in terms of saying all that has to be done is protect it against the design basis. We, ACRS alerted both the industry and the staff that maybe that was pretty shortsighted, and it's now coming to the point where we're saying that maybe it was pretty shortsighted.

MEMBER RAY: Let's try Path, let's try Path 4 for just a minute because Path 3 is, I got this set of assumption that maybe are fine. But with NEI at the microphone here, because I didn't want to have to ask the staff a question about NEI

slides. So do I still have -- can't see around the corner.

MR. TSCHLITZ: Behind you with the microphone.

MEMBER RAY: Okay, I'm sorry.

On Path 4, for example, the thing that really triggered my thought process here originally, got me off on what may be a wrong track is, is a statement that it relies upon -- GMRS exceeds and so on -- but it relies upon, the Path does, qualitative assessment of certain SSEs based on seismic experience.

What does that mean?

MR. TSCHLITZ: I would offer that Greg Hardy and John Richards are the right people to ask that question.

MEMBER RAY: And I'm sorry I didn't ask it at the time.

MR. TSCHLITZ: Right, right.

MEMBER RAY: But I've got to ask it now.

MR. TSCHLITZ: They're the ones that developed the basis for that statement in there and they can provide the defense of the statement in the document.

MEMBER RICCARDELLA: But could we be

clear that under Path 4 that's really only applied to FLEX equipment; right?

CHAIR STETKAR: No. It's, no, Path 4 is the whole enchilada.

MEMBER RAY: See that's what he had been talking, Path 4 or Path 3?

CHAIR STETKAR: Path 4.

MEMBER RICCARDELLA: It says if you exceed your SSE then these are the things you're going to do, as long as it doesn't exceed it by more than a factor of two.

CHAIR STETKAR: That's right.

MEMBER RICCARDELLA: But all these Paths, they really only refer to FLEX equipment and strategies because we're doing an alternate evaluation under 2.1 of everything in the plant for plants that exceed SSE; right?

CHAIR STETKAR: Path 4 includes the phase 1 FLEX response which is the response with the installed equipment.

MEMBER RICCARDELLA: But isn't that also --

(Simultaneous conversation.)

MEMBER RICCARDELLA: So this is also covered by the 2.1?

CHAIR STETKAR: Yes.

MEMBER RICCARDELLA: See, so it's, I mean the evaluation of the whole plant and all the equipment is being done under this other --

MR. SHAMS: Yeah, if I may, let me try to clarify a little bit about Path 4.

So again, you know, so strategies are designed and installed for most plants. And now we just have to exercise if we have a new hazard or a higher hazard, what do we do with that to make sure that those three phases are appropriately implemented.

Again, the different path to go for if you don't have an exceedance, you know, it's fine the way it is. If you have exceeded a high frequency, this is all the area you need to do about it. Path 3 you walk through, if I can demonstrate the capacity of the plant, I'm fine.

Path 4 is one that's perhaps the purest, if I may call it that way just for now. It looks at the three phases, you know, one, the third phase being offsite, it's not a problem. It's remote enough so it shouldn't be an issue.

So now that leaves us with the two phases, and installed plant equipment and the FLEX,

portable FLEX on site. So the installed plant equipment what we try to utilize, what the industry submitted and the staff had seen to be reasonable is there's a considerable body of margin studies have been done.

The one that comes to my mind is an EPRI report that's NP-60-41. It's a large document that walks through based on test data and shake table data for components and also observed seismic, you know, seismic behavior that a plant equipped with SSEs they have two to three times the capacity if they were, you know, designed, used the appropriate codes and standards and they were installed appropriately.

So they give a number a caveats to make that point. They give a number of caveats for different systems. So they walk, for a piping system you'd have that capacity provided that you need these criteria.

For a Cat. 1 structure, concrete or steel, you have this capacity provided. You need these criterias.

So what we're alluding to in here is as long as you're within two times SSE and you meet these criteria, criteria, then you have the

capacity. So that covers plant equipment.

In the second part of Path 4 it says what do you do with the --

MEMBER RICCARDELLA: But my question is isn't plant equipment already being considered --

MR. SHAMS: Hold on a second.

MEMBER RICCARDELLA: -- in another exercise, which is 3.1?

MR. SHAMS: They are, yeah. But it may or may not be the same set of equipment. That's the difference.

Under 2.1 it can be a broader set of equipment. Under 2.1 also you can have, you can have actually seen that there's not necessarily a sufficient increase in hazard so we told the licensee you don't need to do a risk assessment.

So what you're seeing here is the licensee basically reiterating that I think my hazard is low enough I don't need to, I can rely on, you know, what, you know. So that I mean it's very clear. You're right. You're absolutely right. The two paths are very close. We're trying to answer two questions. It wasn't designed to be that way early on and now we're trying to answer two different questions but yet leverage the same

information.

CHAIR STETKAR: Path 4, if I can -- I have to be cognizant of the time here a little bit, and we'll continue this in the next meeting -- Path 4, the reason I have less of a problem, I personally have less of a problem with Path 4 than I did with Path 3, is that Path 4 tells me -- and I don't know what people have actually done here, but it says that apparently some people invoked the so-called expedited seismic evaluation process when they developed their initial FLEX strategies.

And that says, well, we'll essentially develop assurance that our FLEX equipment, storage locations and connection points and all of that stuff to implement FLEX has sufficient capacity up to twice the design basis ground motion response vector.

And Path 4 says, okay, as long as you're less than twice you can take credit for that evaluation that you did already. Great. That says, but that says that I'm evaluating both in-plant equipment and FLEX equipment and storage and connections and all of that kind of stuff.

MEMBER RAY: But that's not what you just said.

CHAIR STETKAR: I know. I don't care what he said. I'm --

MEMBER RAY: No. You.

CHAIR STETKAR: What?

MEMBER RAY: You said it was applied to FLEX equipment. Now you're saying it's applied to both installed plant equipment and FLEX equipment.

CHAIR STETKAR: That's part of the FLEX strategy. I need to use my turbine-drive aux feedwater pump for the first phase 1 coping time, and then I need to hook up a suction source for the pump or an alternate way of feeding the steam generators.

This says that some people decided to evaluate their FLEX strategy, which includes both stuff in the plant and stuff in buildings, to survive an acceleration up to twice the design basis.

MEMBER RICCARDELLA: But it's only that plant equipment needed for FLEX.

CHAIR STETKAR: Right. Well, --

MEMBER RAY: Now wait a minute. That's what is not clear to me.

CHAIR STETKAR: But to come back to -- I agree with Mo's original -- I believe, by the way,

that PRA is the most comprehensive, but I'll give you that Path 4 is a heck of a lot more comprehensive than Path 3. The problem that I have with Path 3 is that Path 3, I get an out by never demonstrating in Path 3 that the FLEX equipment can survive anything more than the original plant design basis earthquake.

MR. SHAMS: Mike, just if I may, a short comment. What Mike alluded to is that the FLEX equipment, even the portable one, are designed to the design basis, just like the plant equipment. So there's inherent margin in that. We just didn't particularly quantify what that margin is. But there's an inherent margin in that. Just, again, given the conservatism and how we use codes and material and properties.

CHAIR STETKAR: See, my point is why give people an out on Path 3? Why not just say Path 4 is what you want?

Because that will tell them to look at everything and you'll evaluate whatever margin was in your FLEX equipment. And you can take credit for all of that good stuff that was done in the IPEEEs to develop, you know, fragilities for new plant equipment and DCLFs and all of that, you know,

stuff.

And it would satisfy the need to at least say, yes, we took a look at the FLEX equipment and strategies that was installed based on the original evaluation, and we have confidence that it will survive at least against the reevaluated seismic hazard, without, without having kind of this artificial way of getting out for, you know, I don't care, eight plants or whatever who don't have to look at the FLEX, might not have to.

MR. SHAMS: It's only a purer way to go with everyone doing a Path 4. But, again, the idea was to utilize every piece of information the plant has and not to overburden people with analyses that ultimately would basically just add to the decision, which is already known: the plant can survive. So that was the logic the staff used.

CHAIR STETKAR: Let's -- I do have to be somewhat cognizant of time.

We certainly, you at least you've satisfied given your feedback. I think you've heard that there's some concern about the Path 3 assessments and how they might be applied. Do you have any more comments for the staff, or questions? Anybody?

(No response.)

CHAIR STETKAR: Okay. Let's go through, Mike, get the outside line open. I don't know if anybody is on the outside or not.

Let me ask while we're doing that if there is anyone -- I'm running the meeting. We're trying to give them quick feedback. We're up against the wall on time here.

So, Tim, you know, I apologize. We're truncating stuff. That's fine.

MR. REED: Perfectly fine with us.

CHAIR STETKAR: Especially because we're going to need this at DG 13-01 anyway later.

While we're getting the outside bridge line open is there anyone in the room who would like to make a comment? If so, come up to the microphone and do so.

(No response.)

CHAIR STETKAR: Hearing nothing, if there is anyone on the bridge line, do me a favor and just say hello so we have confirmation that it's open.

PARTICIPANT: Hello.

CHAIR STETKAR: Thank you.

And if there's anyone of the public on

the bridge line who would like to make a comment, please identify yourself and do so.

(No response.)

CHAIR STETKAR: Hearing nothing, we'll re-close the bridge line so it doesn't pop.

And as we usually do during subcommittee meetings I will take one pass around the table. I'll start with Steve, as I did yesterday, put him on the -- Steve, do you have any final comments? Turn your microphone on.

DR. SCHULTZ: Just one. And that has to do with what we've already discussed. That is, first, I'm glad that NEI is continuing to lead industry activity associated with sharing industry experiences. Implementation is being done.

But I would just segue that into expecting that NEI is going to work on capturing what is found in that in guidance for the future. And I think, Tim, you've stated it well, that in doing what we need to do for mitigating strategies in a rulemaking we need to be sure that the final of the final rule and the supporting documents, all are very clearly written so that they can be not only used today but supported and maintained as we expect them to be in terms of implementation down the road,

decades as well as a few years.

Thank you.

CHAIR STETKAR: Thank you. Pete?

MEMBER RICCARDELLA: Yeah. Despite what it might sound like from the comments, I think industry and the staff have made significant progress in this Appendix H area. And I'm just looking forward to seeing what Path 5 is going to look like.

CHAIR STETKAR: Harold?

MEMBER RAY: Yeah. I obviously need to do some more homework. But I would just observe that when we do talk about Path 5 I can't guarantee that there won't be some sliding back into Path 4 at that point in time. And that's fine.

CHAIR STETKAR: Dick?

MEMBER SKILLMAN: No comment. Thank you.

CHAIR STETKAR: Dana?

MEMBER POWERS: Nothing.

CHAIR STETKAR: Dennis?

MEMBER BLEY: Nothing.

CHAIR STETKAR: Ron?

MEMBER BALLINGER: Nothing.

CHAIR STETKAR: Charlie?

MEMBER BROWN: No.

CHAIR STETKAR: Joy?

MEMBER REMPE: No.

CHAIR STETKAR: Thanks to everyone, staff and the industry. I know I truncated the last one pretty quickly but, as I said, we wanted to get your feedback.

Make sure that we start talking about the schedule to revisit this in a timely fashion.

And with that, we are adjourned for this meeting.

(Whereupon, at 12:36 p.m., the above-entitled matter was adjourned.)

NEI 12-06, Rev. 2
Summary of Changes

ACRS Fukushima Subcommittee

April 22, 2016

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	ADVs Manually Operated to Maintain RCS Heat Removal	4	ADVs 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

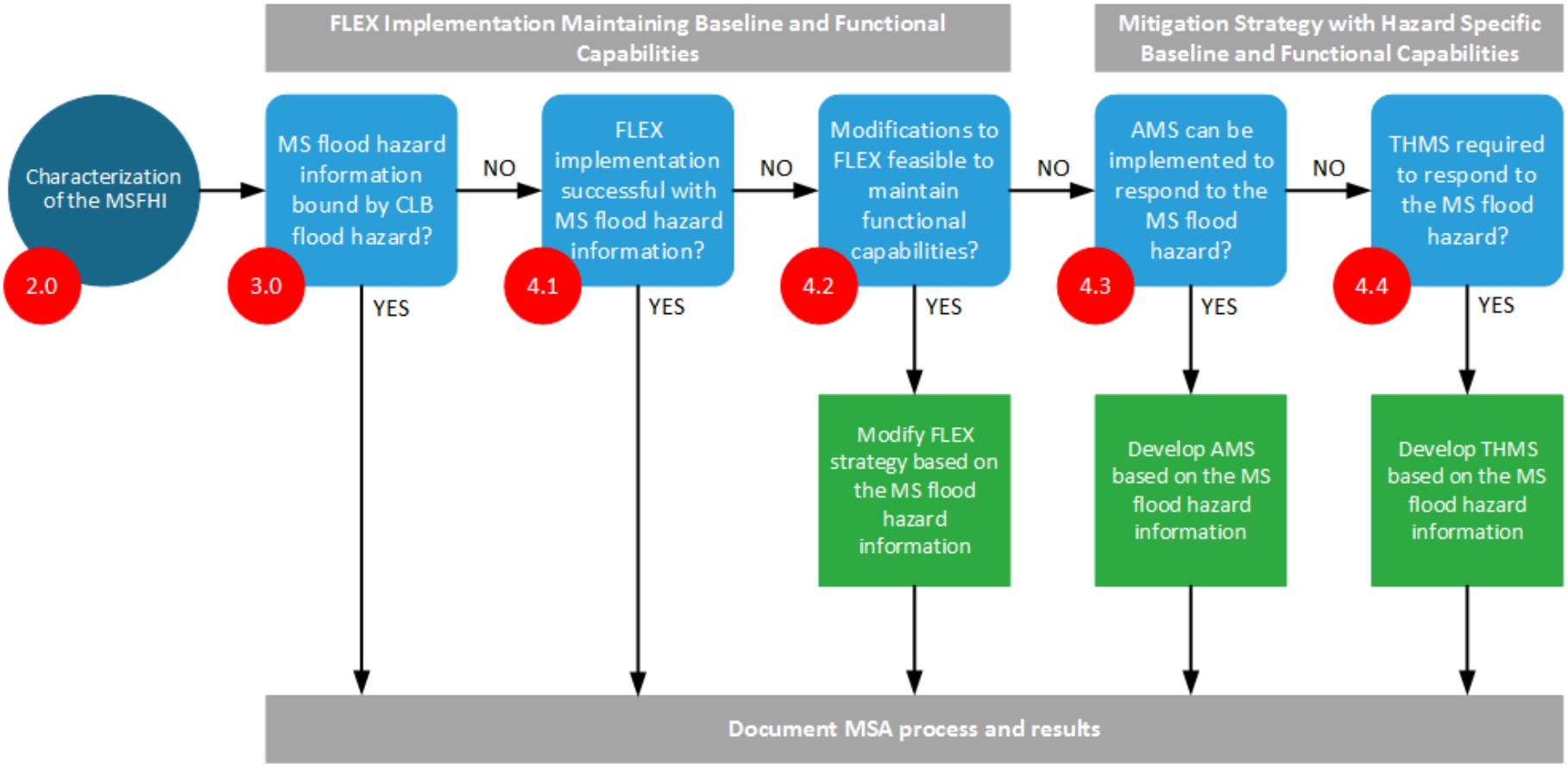
April 22, 2016

Jim Riley
Sr. Technical Advisor, NEI

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
Sr. Project Manager, NEI

Status

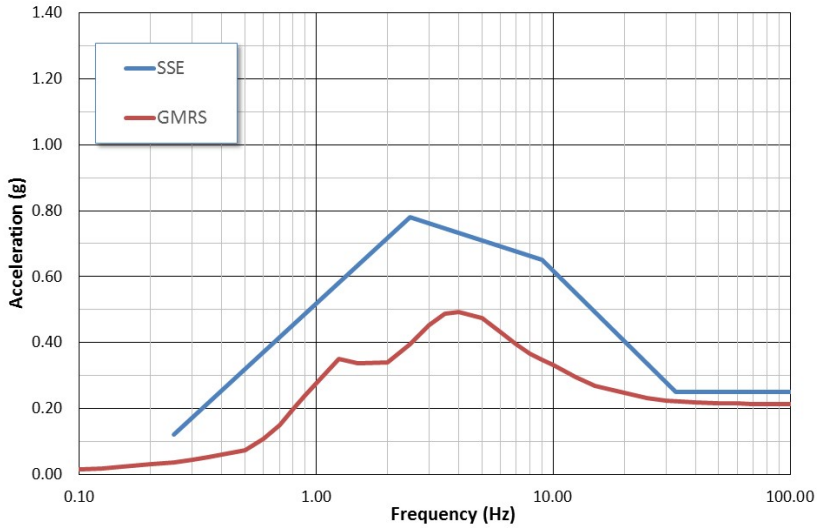
- Appendix H contains guidance for mitigation strategy assessments (MSA) for all plants where the GMRS ≤ 2xSSE
- These MSAs will be submitted by August 2017
- JLD-ISG-2012-01 endorsed the guidance on January 22, 2016
- All MSAs for seismic maintain the three key safety functions of core cooling, containment, 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 ≤ 2xSSE (1-10 Hz)
Path 5	GMRS > 2xSSE

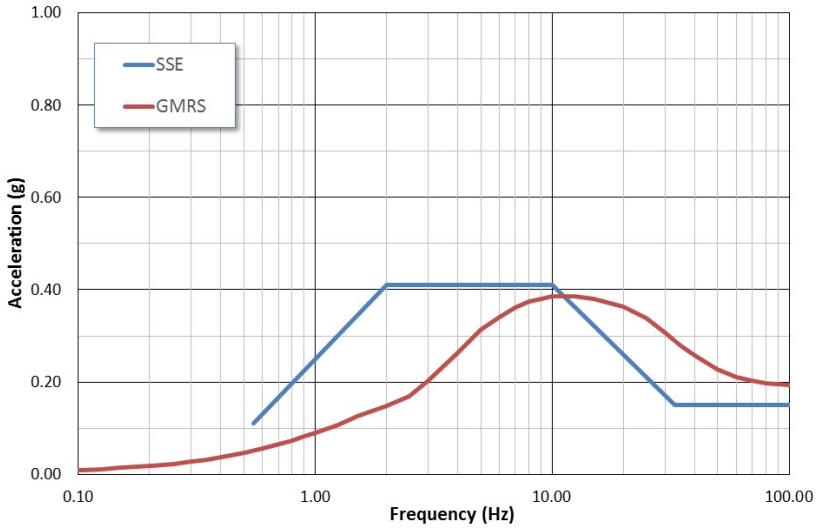
Path 1

- 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



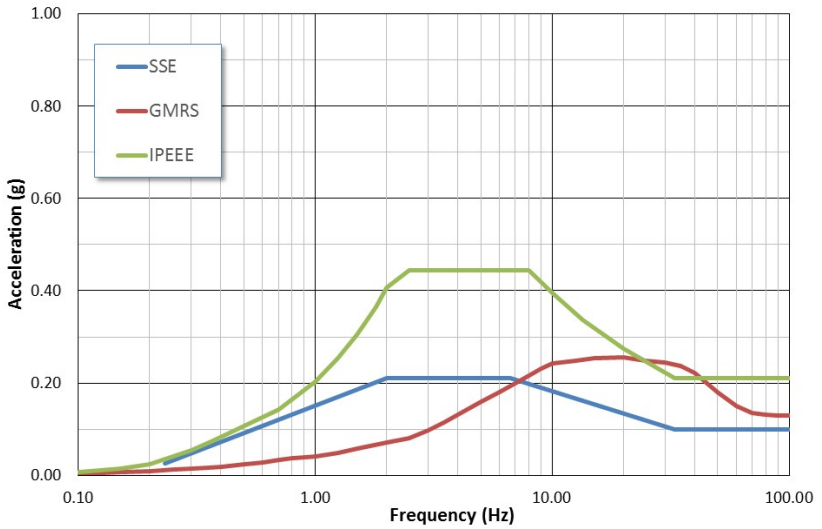
Path 2

- 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



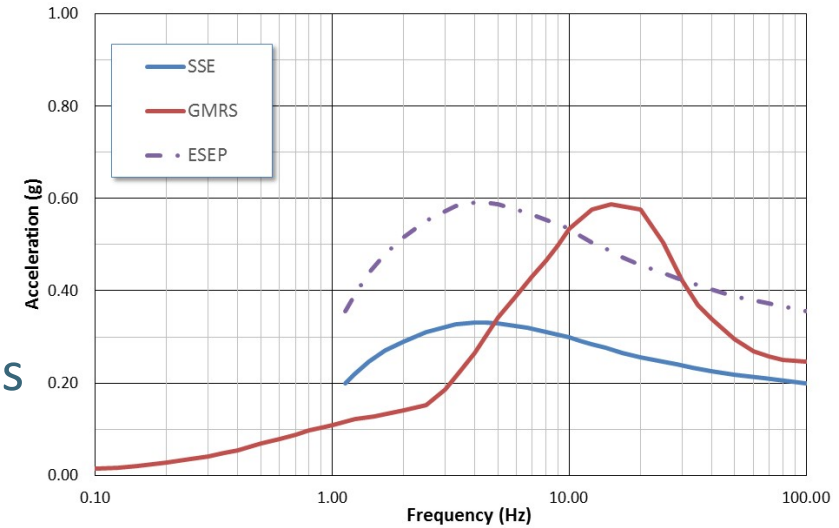
Path 3

- 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

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

U.S.NRC

United States Nuclear Regulatory Commission

Protecting People and the Environment

Draft Regulatory Guides for the Mitigation of Beyond-Design-Basis Events Rulemaking

ACRS Fukushima Subcommittee

Eric E. Bowman

April 22, 2016

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

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

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

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

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

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