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 for Operating Reactors

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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PUBLIC MEETING ON SEISMIC RISK EVALUATIONS
FOR OPERATING REACTORS

+ + + + +

WEDNESDAY

MAY 18, 2011

+ + + + +

The meeting convened in the Commissioners'
Hearing Room at One White Flint North, 11555 Rockville
Pike, Rockville, Maryland, at 9:00 a.m., Pat Hiland,
NRC, presiding.

NRC PARTICIPANTS:

PATRICK HILAND, NRR/DE
JON AKE, RES/DE
BENJAMIN BEASLEY, RES/DRA
NILESH CHOKSHI, NRO/DSER
DOUG COE, RES/DRA
MARY DROUIN, RES/DRA*
NICHOLE GLENN, NRR/DORL
STEVEN LAUR, NRR/DRA
YONG LI, NRO/DSER
KAMAL MANOLY, NRR/DE
CLIFFORD MUNSON, NRO/DSER

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

9:00 a.m.

MS. GLENN: Good morning, ladies and gentlemen. I see someone's awake. Thank you for taking the time to participate in this public meeting today. We have a very ambitious agenda.

Before we get started, I'd like to cover some good housekeeping rules. For those of you who have not been here before, the restrooms are right outside this main door. You'll find them in the hallway. You do not need to be escorted there. We'll have several breaks so you can make use of them.

The emergency exits are labeled on each side of the room. The emergency exits on my left, to some of your right, go pretty closely to the exterior door.

If we were in need of exiting on the other side, we would be channeled to the other building. Hopefully, we won't need to know that.

If you haven't signed the attendee list yet, that is right around the corner to my right. Please do so at the break. We want to make sure we acknowledge all of our participants. And with that, we'll go into some of the business at hand.

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1 The purpose of today's meeting, and I'm
2 going to read this directly from the notice that was
3 posted publicly, is to discuss the NRC's information
4 collection needs desired from operating power reactors
5 and independent spent fuel storage installations.

6 The Office of Nuclear Reactor Regulation
7 requires specific information relating to licensee
8 facilities to enable the NRC staff to complete the
9 Regulatory Assessment of impact from increased seismic
10 hazard estimates at some operating reactor sites.

11 NRR is developing a potential Generic
12 Letter to request needed data from power reactor
13 licensees.

14 This is a Category 2 public meeting, which
15 allows the public to participate at designated points
16 identified on the agenda.

17 This meeting will not decide any agency or
18 staff positions, and it will not interpret regulations
19 other than what is currently established by guidance
20 or staff position. No decisions regarding this topic
21 will be made at this meeting.

22 So, the format of this meeting is
23 collaborative. But due to the large number of
24 participants we have both in person and virtually,
25 we'll set up some ground rules to make sure that

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1 everyone has an opportunity to participate and be
2 heard if they so choose.

3 My name is Nichole Glenn. I will be
4 facilitating this session. Helping me out in the back
5 corner is Alison Rivera. We are both NRC
6 facilitators.

7 Assisting us and providing support to all
8 of your are Sheldon Stuchell, who is a senior project
9 manager in the Division of Policy and Rulemaking to my
10 right; and Jonathan Rowley, who is in the corner, who
11 is also a project manager in DPR; as well as Andrea
12 Russell, who is beyond the pillar, who is also project
13 manager in DPR.

14 I am introducing them because we are the
15 people who can help you if you have any needs or you
16 have any questions about the structure or logistics of
17 this meeting.

18 Again, because we do have such a large
19 number of participants, the format of this meeting
20 will be general presentation and discussion. And then
21 we'll have periods where each participant has the
22 opportunity to weigh in.

23 How we'll do this is we'll survey the
24 table first. Then, we'll have an opportunity for the
25 folks in the room to contribute. There are mics set

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1 up at the corner of each pillar. So, you're welcome
2 to approach those mics, or Alison or I can help you
3 out by bringing the roving mics to you.

4 Once we get the contribution from the
5 room, we will go ahead and survey the phones, the
6 people participating remotely.

7 Now, a couple ground rules. We are having
8 a transcriber take notes on this meeting, which will
9 be available later on. So, most of the ground rules
10 have to do with being kind to your transcriber.

11 So, we'll ask that cell phones be muted
12 and that side conversations be limited, because we
13 want our transcriber to be able to capture the content
14 of conversations in this meeting. It's very important
15 to capture your input.

16 Also to that end, we'll ask each speaker
17 to speak one at a time. We know that a lot of lively
18 discussions may ensue. But in order to capture the
19 content, we need people to speak one at a time and to
20 give each speaker an opportunity to wrap up before the
21 next person weighs in.

22 We do have an email address for anyone
23 who's participating remotely, that is being displayed
24 at the bottom of the current slide. That is Jonathan
25 Rowley at NRC.com. So, it's jonathan.rowley@nrc.com.

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1 We will also have an opportunity to read
2 off any textual questions and comments that come in
3 via that address as we go through the meeting.

4 Having said that, I will now turn the
5 meeting over to Pat Hiland, the Director of the
6 Department of Engineering.

7 MR. HILAND: Yes, thank you, Nichole. And
8 thank you everyone in the room, for choosing to attend
9 this meeting.

10 I know a number of people traveled from
11 the other side of the country to attend and listen and
12 participate. And I certainly do appreciate that.

13 From the NRC side, we do have three of our
14 major offices represented by their senior managers.
15 As Nichole mentioned, I'm the Director of the Division
16 of Engineering in the Office of Nuclear Reactor
17 Regulation.

18 We also have Dr. Nilesh Chokshi, who is
19 Senior Manager in the Office of New Reactors. And we
20 also have Mr. Doug Coe from the Office of Research.
21 He's a Senior Manager in the Office of Research.

22 What I'm going to do is ask the folks here
23 at the table to introduce themselves and their
24 affiliation.

25 I'm not going to go around the room or

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1 over the phone because of the number of participants,
2 but let's just start with that.

3 MR. MANOLY: I'm Kamal Manoly, Senior
4 Technical Advisor, Division of Engineering, NRR.

5 MR. STUTZKE: I'm Marty Stutzke. I'm the
6 Senior Technical Advisor for Probabilistic Risk
7 Assessment Technology, Division of Risk Analysis,
8 Office of Research.

9 I'm one of the primary authors of the
10 Safety/Risk Assessment for Generic Issue 199.

11 MR. LI: Yong Li, geophysicist at NRC.

12 MR. LAUR: Steve Laur, NRR, Division of
13 Risk Assessment.

14 MS. KEITHLINE: The empty chair next to me
15 will be Alex Marion from the Nuclear Energy Institute,
16 when he arrives. He has another meeting, but will be
17 joining us in a little bit.

18 I'm Kimberly Keithline, Senior Project
19 Manager at the Nuclear Energy Institute.

20 MR. MOORE: My name is Don Moore. I'm with
21 Southern Nuclear. I'm a Consulting Engineer with them
22 and I've been involved in seismic issues and seismic
23 like IPEEE and other issues over the years.

24 MR. HARDY: I'm Greg Hardy with Simpson
25 Gumpertz & Heger, and I'm a consultant to EPRI, and

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1 involved in research relative to SPRA and seismic
2 margin studies.

3 MR. CHOKSHI: Nilesh Choksi, NRC.

4 MR. AKE: Jon Ake, seismologist, NRC,
5 Office of Research, Division of Engineering. And I'm
6 Marty Stutzke's co-conspirator on the Safety/Risk
7 Analysis Report.

8 DR. MUNSON: Cliff Munson. I'm Senior
9 Technical Advisor in New Reactors.

10 MR. HILAND: Okay. Thank you.

11 Are there any elected officials or their
12 representatives in the audience or over the audio
13 network that would like to introduce themselves?

14 (No response.)

15 MR. HILAND: Hearing none, thank you.

16 Today's meeting is, you know, I'd like
17 this - this is advertised as a workshop. And that
18 means we expect to have a lot of discussion over some
19 of the ideas and the topics that are on our agenda.

20 I've asked for the facilitators, Nichole,
21 to keep us on track. And so, please, you know, let's
22 let her guide us through.

23 We have a lot of things to cover. We may
24 not cover everything today. The process that we're
25 in, in developing generic communications, this is kind

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1 of unique to have a pre-meeting to solicit some public
2 input before we actually put out a draft document.

3 When the draft document goes out, there
4 will be a 60-day comment period for additional public
5 comments.

6 And so, you know, we're trying to develop
7 some thoughts and some ideas to minimize the amount of
8 effort that we would take in that 60-day public
9 comment period.

10 With that, Kimberly, any comments you'd
11 like to make?

12 MS. KEITHLINE: Just a few very brief
13 comments, Pat.

14 This is Kimberly Keithline from NEI, and I
15 wanted to say that we appreciate the opportunity to
16 participate in this public meeting on Generic Issue
17 199.

18 As this issue developed and started going
19 through the generic issue process, we assembled an
20 industry team with significant seismic expertise to
21 explore possible options for resolving this issue.
22 And we see that you, too, have really assembled an A-
23 Team to work on this.

24 I'm not sure what the scientific units are
25 for measuring brainpower, but the cranial work being

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1 performed in this room is really quite impressive to
2 the extent that it actually becomes very difficult to
3 summarize the brilliant ideas that are being generated
4 on simple PowerPoint slides.

5 We are slideless today, but I think that
6 we'll engage in some very productive discussion with
7 you.

8 We've discussed a range of approaches for
9 resolving Generic Issue 199. Each has its own set of
10 possible options and assumptions.

11 And that makes it difficult to represent
12 these in only two dimensions, but we look forward to
13 the discussion today so that we can better understand
14 your objectives for resolving GI-199 and other key
15 considerations that might affect the development of
16 the optimum solution path.

17 And there's not enough room here at the
18 table, although we have an empty seat right now,
19 there's not enough room for everyone to sit at the
20 table who will really need to be involved in the
21 discussion today.

22 So, we're glad that you've got mics
23 throughout the room, and at some points we'll ask to
24 phone our friends behind us and have them join in to
25 either ask questions to help us understand, or to

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1 provide some comments or some feedback that might help
2 you understand what our constraints and challenges
3 might be with certain options going forward.

4 And with that, I think we're ready to
5 carry on and get this meeting really underway.

6 MR. HILAND: Okay. Thank you.

7 With that, let's go to Slide 2, the
8 objectives of the meeting, you heard Nichole mention
9 beforehand, is to provide a forum for discussion.

10 And I hope that during today's meeting -
11 we have the room until 3:00 p.m. and we have scheduled
12 a one-hour lunch break. However, we also have the
13 room reserved for an additional hour and I've asked my
14 staff if they would be willing to stay around.

15 If anyone has any questions or further
16 discussions on topics, we would certainly be willing
17 to stay past the closure - the official closure time
18 of the meeting to answer those questions. I think Mr.
19 Manoly will be willing to stay past three o'clock.

20 Anyway, we mentioned the objectives of the
21 meeting here. At the end, I'll try to go over some of
22 the timeliness schedules that we anticipate.

23 Moving on to Slide 3, this is just a brief
24 outline of - I know we have prepared a number of
25 slides. However, the intent is to provide an overview

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1 of Generic Issue 199.

2 I know a lot of you have heard it in the
3 past and have read the Safety/Risk Assessment Report
4 and I think the overview will be about a five-minute
5 discussion.

6 The information needs for GI-199 from the
7 NRC's perspective today, and then possible methods to
8 be used in developing those both in the seismic hazard
9 methodology, as well as the plant evaluation. And as
10 I mentioned, the schedule and strategy at the end.

11 With that, let me turn it over to Mr.
12 Beasley. He's a branch chief in the Office of
13 Research. And he'll summarize GI-199.

14 MR. BEASLEY: Thanks, Pat. And I may take
15 more than five minutes, but it won't be much more than
16 five minutes.

17 On the next slide, you see - I have my
18 slides out of order. I'll look at yours.

19 The Generic Issues Program is an agency-
20 wide program. It's administered by the Office of
21 Nuclear Regulatory Research. And it's implemented
22 through our guidance document, Management Directive
23 6.4.

24 I also want to mention that we have a
25 guidance document that's an office instruction that

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1 gets more specific that is publicly available. You
2 can get it through our agency-wide document management
3 system, ADAMS. And if you're taking notes, I'll just
4 give you that ML number right quick. It's
5 ML102500426.

6 And that is our office instruction that
7 gives us very specific guidance on how to process
8 generic issues.

9 The Generic Issue Program brings some
10 characteristics and value that it adds to handling of
11 a safety concern.

12 It advances, it investigates the issue to
13 increase the understanding of it. It finds the best
14 place, the best approach for addressing an issue.

15 It develops - the program is designed to
16 develop consensus within the NRC. And we also want it
17 to be a very open and public process.

18 In order to do that, we are engaging
19 stakeholders. And with respect to that, this is the
20 third public meeting that we have held on Generic
21 Issue 199.

22 The two prior meetings, one of them was at
23 the end of the screening stage. And then we held one
24 last fall at the end of the Safety/Risk Assessment.

25 And speaking of the stages of the Generic

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1 Issue Program, we'll go on to the next slide. It just
2 gives you those five stages.

3 First of course is identification of the
4 issue. And then we do a very quick acceptance review
5 of the issue. That acceptance review quickly looks at
6 the seven criteria in the Generic Issue Program about
7 whether or not an issue warrants becoming a Generic
8 Issue.

9 If it is accepted, then it goes through a
10 screening process. That is a more in-depth analysis.

11 Although, it is still a quick analysis.

12 If it passes screening, it then becomes a
13 bona fide generic issue and goes into a more in-depth
14 Safety/Risk Assessment.

15 And that is what was completed last fall.

16 And we'll talk in a moment about the results of that
17 Safety/Risk Assessment.

18 Part of the screening stage and the
19 Safety/Risk Assessment stage is that it - we use a
20 panel within the Agency from each of the different
21 offices so that we can build consensus within the
22 Office, we have a unified approach, and we have a
23 variety of input on how to handle that issue.

24 And that panel makes a recommendation on
25 how to move forward with the issue. And then that

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1 recommendation is endorsed by the Director of the
2 Office of Research. And that is what was done last
3 fall, and the recommendation was to move forward with
4 this issue. So, that puts us in the arena of
5 Regulatory Assessment.

6 So, to move forward with this issue, we
7 needed to get to the point of actually evaluating what
8 changes can be made, what can we do as regulators to
9 handle this issue. So, that's the stage we're in
10 right now.

11 Moving on to the next slide, I will
12 quickly talk about the results of the Safety/Risk
13 Assessment.

14 The first thing to point out is that we
15 concluded that all operating power plants are safe.
16 The seismic hazard estimates have increased. But in a
17 relative sense, they are still small.

18 And again the conclusion was that the
19 assessment of this issue should continue, but we don't
20 have enough information in order to do that Regulatory
21 Assessment. And so, we needed to pursue obtaining
22 that information.

23 The recommendation was that the NRC should
24 request that needed information, and currently it is
25 proposed that we do that through a Generic Letter.

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1 So, the next slide talks briefly about the
2 information needs that were identified during the
3 Safety/Risk Assessment and that we proposed to get
4 through a Generic Letter.

5 And I also want to point out that although
6 this is a Generic Issue, it is - it doesn't have
7 generic solutions. Every plant is going to be
8 different.

9 And so we need for each plant, the
10 information identified on this slide. We need updated
11 site-specific hazard curves and the response spectra,
12 we need fragility information, we need to know what
13 the significant contributors to seismic risk are, and
14 we need to have, you know, licensee assistance in
15 identifying the potential plant-specific improvements.

16 So with that, I will turn it back over to
17 Pat, or it may go to Jon Ake, for discussion of our
18 approach in the Safety/Risk Assessment.

19 MR. HILAND: Okay. Thank you, Ben.

20 Jon.

21 MR. AKE: Thanks, Pat.

22 This is a little bit unusual situation for
23 me. Normally I have a small block of time on the
24 agenda and 22 slides. And in this case, I have a
25 large block of time on the agenda and two slides. So,

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1 this is definitely a change of pace for me.

2 As you all know, this issue arose out of
3 our evolving understanding of seismic hazards in the
4 United States. And developing robust hazard estimates
5 is key to performing required regulatory analyses that
6 Ben just noted a moment ago.

7 And over the next two slides, I'd like to
8 briefly outline some of what the staff feels is the
9 appropriate information to be developed to allow us to
10 perform that regulatory analysis.

11 The Safety/Risk Assessment used a version
12 of the United States Geological Survey 2008 seismic
13 hazard model for the Eastern United States to develop
14 representative and consistent estimates of the seismic
15 hazard at specific nuclear power plant sites.

16 However, we would note that this
17 particular model has been developed and utilized for
18 purposes other than critical facility evaluation and
19 siting.

20 The relative impact and importance of
21 certain assumptions within that model for small annual
22 exceedance frequencies that are of interest to us
23 especially in the regulatory analysis that we're
24 likely to perform, remain open to question.

25 And so, our push going forward is to use a

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1 different seismic hazard model for all of the existing
2 plants in the Central and Eastern United States.

3 And specifically our request as outlined
4 on the first slide here dealing with seismic hazards,
5 is for the licensees to perform a Probabilistic
6 Seismic Hazard Analysis to develop site-specific rock
7 hazard curves at each nuclear power plant location.

8 In particular, we think the appropriate
9 path forward is to use what's called the Central and
10 Eastern United States Seismic Source Characterization
11 Model, which is currently in final development stages.

12 That's a multi-agency consensus hazard
13 model that's being developed by the Nuclear Reg
14 support by industry through EPRI, DOE and the US NRC.

15 The expected completion date for that particular
16 study is in late calendar year 2011.

17 We would like to see individual licensees
18 perform an assessment using that model that was
19 developed using an open transparent SSHAC process,
20 Senior Seismic Hazard Analysis Committee process,
21 that's consistent with NRC guidelines, and use the
22 latest ground motion models in conjunction with that
23 source characterization model.

24 We indicate on the slide here the EPRI
25 2004 and 2006 Ground Motion Prediction Equations

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1 should be used with that model.

2 As Ben noted, and the reason we request
3 this for all sites, is, as Ben noted, this is being
4 treated - is noted as a Generic Issue, but it's not
5 really. It's a site-specific issue.

6 We can't treat whole classes of plants
7 generically. So, we will need to have site-specific
8 information.

9 In the Safety/Risk Analysis Report that
10 Marty and I worked on, we used very simplified generic
11 site response functions for the non-rock sites.

12 These site response functions are quite
13 important for soil sites. And we feel that the
14 application of those generic functions moving forward
15 to the Regulatory Analysis phase is inappropriate. We
16 need to develop site-specific site response functions.

17 And the second part, the second bullet on
18 this slide, we request that the licensees perform site
19 response analyses to determine control point hazard
20 curves.

21 This development of these site response
22 functions can be used using original site
23 investigations that are included in the original FSAR
24 for each of the plants. However, we note that there
25 is a limited amount of data for some of these sites in

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1 the original Safety Analysis Reports.

2 And so, it's important that we adequately
3 represent and capture the uncertainties that arise
4 from having a limited database for things like shear
5 wave velocity profiles at the site.

6 And since the likely outcome of this is it
7 in some cases can be used in a Probabilistic Risk
8 Analysis, we will need to have the site amplification
9 functions developed over a broad range of amplitude
10 values so that we can develop site-specific hazard
11 curves.

12 And we will allow as we note on here, a
13 limited use of the cumulative absolute velocity, or
14 CAV, filter. And what we mean by limited CAV
15 filtering is over a limited range of magnitudes.

16 We indicate that limited magnitude range
17 up to five-and-a-half or five-and-three-quarters is
18 what we're discussing right now. Although, we haven't
19 finalized a particular value on that as yet.

20 Moving on to the next slide, the other
21 specific request for developing seismic hazard
22 estimates at the individual sites are to perform a de-
23 aggregation to determine the low and high-frequency
24 Controlling Earthquakes consistent with the discussion
25 in Regulatory Guide 1.208, at frequencies of ten to

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1 the minus four per year, and ten to the minus five per
2 year.

3 We also request that the licensees develop
4 performance-based Ground Motion Response Spectra, or
5 GMRS, following the guidance outlined in Regulatory
6 Guide 1.208.

7 And then to perform a hazard screening
8 evaluation where we compare the GMRS with the existing
9 safe shutdown earthquake, or SSE, for each of the
10 individual plants.

11 And then the results of these seismic
12 hazard assessments we used in a - in the form of site-
13 specific site-corrected hazard curves which we used in
14 the plant evaluation that Nilesh is going to describe
15 in a couple moments.

16 MS. GLENN: All right. Thank you, Jon.

17 If you're following the agenda, you'll
18 know that we are aggressively ahead of schedule. So,
19 it seems appropriate right now to open up the floor
20 for comment, and we'll start with the table first.

21 MS. KEITHLINE: So, we could go ahead and
22 ask now?

23 Okay. This is Kimberly Keithline from
24 NEI. I have a couple just real basic questions for
25 you, Jon, I think.

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1 Regarding the CEUS-Seismic Source
2 Characterization model that's due to be completed
3 toward the end of this year, can you tell us a little
4 bit - and it might be more than just you - about NRC's
5 plans and timing for endorsing that new model?

6 We're trying to understand if it's going
7 to go through a comment period to be endorsed either
8 through an interim staff guidance document or
9 potentially in a Reg Guide, how that fits in with the
10 timing of resolving GI-199.

11 And then similarly, I'm interested in any
12 thoughts you have about the next ground motion model
13 that's being developed, the NGA East model, and how -
14 your slides say that I think you would expect
15 licensees to use the current ground motion models, but
16 we'd like to understand better how then the next model
17 coming out might affect resolution of this issue if
18 work would have to be redone or how that just all fits
19 together.

20 So, how those two pieces fit in with this
21 process is something that we'd like to hear more
22 about, if we could.

23 MR. AKE: I'll answer the first part of
24 that. And then I'm going to toss it over to Cliff to
25 try and answer the second part.

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1 I'm a member, as a number of other people
2 in this room are, of the Peer Review Panel on the
3 CEUS-SSC model, if you'll allow me to burden you with
4 acronyms.

5 If the team, the project team, delivers
6 according to the schedule outlined now, I'm relatively
7 confident that the final report and the peer review
8 letter back to the project will be produced in a time
9 that is generally consistent with what we've outlined
10 on these slides.

11 But as far as -- Cliff Munson and others
12 are in charge of the NRC review of that model, and I
13 defer to Cliff as far as the timing on when they think
14 they're going to get their review done.

15 DR. MUNSON: First I'd like to stress that
16 the NRC has been involved with this since the
17 beginning. So, it's not like we're going to review
18 this cold. We've been actively participating as
19 participants in the process.

20 We recently decided instead of waiting
21 until the end of the year to begin our review, that we
22 would review the draft report in two parts in
23 concurrence with the PPRP.

24 So, at the end of this month we're going
25 to review the first part of the report and the model.

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1 And then towards August, we'll start the second part
2 of the review. So, that will be concurrent with the
3 PPRP also doing its internal review.

4 So, we expect to have comments in
5 September. And the December 31 will have - we won't
6 hold up that issue inside the report.

7 MR. AKE: And could you restate the last
8 part of your question to make sure I get -

9 MS. KEITHLINE: Yes, it still related to
10 the source model.

11 Do you envision that there would be either
12 an interim staff guidance document or a regulatory
13 guide revision that would endorse that? Will it go
14 through a public comment period?

15 DR. MUNSON: As part of the ISG, I believe
16 we do have a public comment period. I don't know if
17 Nilesh wants to comment on that.

18 MR. CHOKSHI: I think there are two
19 questions. One is the formal process of, you know,
20 endorsing that. Another thing is to get to the point
21 where it's, you know, this is the -- you know, because
22 all the people I know are a lot of stakeholders in
23 this process.

24 So I think at the end of December we
25 expect to -- that we'll have basically a -- in a

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1 position which has been already vetted.

2 Now, the formal, I think the plan is to
3 either, you know, have ISG or look at, you know, maybe
4 some other vehicle, but that might not happen in
5 tandem. It might be a time lag, but I think the goal
6 is the time - this period that everybody, you know, we
7 will have enough to substantially use of the models.

8 DR. MUNSON: So, we wouldn't envision that
9 people would have to wait for an ISG to come out
10 before they can start using the new CEUS-SSC.

11 Want to comment on NGA East, Jon?

12 MR. AKE: Yes. The current schedule for
13 NGA East is far enough out that we don't feel it's
14 appropriate to wait for the issuance of the final
15 results from that project to begin this assessment.

16 We feel we need to move into the
17 regulatory analysis phase prior to the development -
18 final development of those models.

19 And with regard to your question about
20 would this imply a reevaluation in some fashion?
21 Probably. But what we're hoping for is that the
22 process we put together is sufficiently robust and
23 easily dissected that it will facilitate the
24 evaluation of any new seismic hazard information
25 easily without, you know, a complete re-working of

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1 everything that's been done.

2 MR. CHOKSHI: And I wanted to mention also
3 that I think the question is good about how they're
4 going to handle this. So, he will give it some
5 thought. And if he try to do it, you know, as - keep
6 it in parallel process so we can, you know, so it is
7 more formal.

8 MS. KEITHLINE: Okay. Thanks.

9 Just to follow up then, the timing of the
10 NGA East ground motion model I've heard, is maybe in
11 the 2014 or so time frame.

12 And so if that's too late for GI-199, does
13 that mean that we're trying to find a path that gets
14 us to completing GI-199 before or around - by around
15 the 2014 time frame?

16 I'm just trying to see how all those
17 things fit together in my mind.

18 MR. AKE: I'm not sure staff has really
19 identified a particular timeline at this point in
20 time.

21 DR. MUNSON: Yes, I think we're going to
22 have that discussion a little bit later on the
23 schedule.

24 MR. HILAND: Well, I'd like to complete it
25 next month, but we've been working on this for five

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1 years - over five years, and obviously there's a lot
2 of detailed information that's required of everybody.

3 And so - and I'll jump ahead. I mean, my
4 goal - and I'm the one that -- I keep pushing Mr.
5 Munson here to give me that report by the end of the
6 year and not to go beyond. And so, we're having
7 continual discussion on that because of all the people
8 involved.

9 However, my goal is to get the generic
10 communications out by the end of the year. And for
11 those who are not familiar with the process, just real
12 quickly, I got to go through a lot of hoops, you know.

13 I have to draft a generic communications,
14 and I'm going to do that beginning tomorrow. And I'll
15 have to present that through the ACRS, Advisory
16 Committee on Reactor Safety. I have to go up and talk
17 to the Commissioner's technical assistants about a
18 generic communication on that. I'll have to go
19 through the Committee to review generic requirements,
20 the CRGR.

21 All of those people have a part to play
22 and to keep me within the guidelines and the rules as
23 I know NEI is always trying to do. So, I have that
24 before I issue the draft for public comment.

25 And that goes out and I'm, you know,

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1 committed to go out for sixty days. Public comment
2 period.

3 So, we get it back in the fall, early
4 fall, late summer. We resolve the comments to the
5 best of our ability. And so, I'm looking to actually
6 get a generic communication on the street by the end
7 of the year.

8 And if you note, I'm using the term
9 "generic communication" versus "generic letter,"
10 because all those hoops could stop me and say a
11 Generic Letter is not the correct thing, use something
12 different. And so, you know, while my goal is still a
13 Generic Letter, it may be generic communications.

14 So, that kind of ties back with the work
15 that's being done, you know, on this committee that's
16 been formed by DOE and EPRI and NRC. And hopefully
17 that work will be done, you know, to complement the
18 generic communications.

19 MS. KEITHLINE: Okay. Thank you. That's
20 helpful. I think I have one more question. And I'm
21 sure that the others in the room and next to me
22 probably have some questions just to make sure we
23 understand what you're thinking.

24 And my question, I'm sure they might be
25 able to follow up with some better description of

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1 these types of questions.

2 But related to the CAV, limited CAV
3 filtering, do you have in mind that what you would
4 expect in this case for this type of an evaluation
5 would be different from what - how CAV filtering might
6 be used in other evaluations, or are you thinking of
7 this in terms of the same?

8 I'm not sure whether there's a new or
9 different concern that's come up related to CAV
10 filtering.

11 DR. MUNSON: Well, we've - Jon and I
12 recently gave a presentation at an SSA meeting,
13 seismology meeting, in Memphis on the CAV filtering.
14 And we don't have specific concerns, per se, about CAV
15 filtering, but we have noted that the original intent
16 of the CAV filtering was to filter out non-damaging
17 smaller-magnitude earthquakes.

18 And certainly if you look at how CAV
19 filtering is working now, it goes over the whole
20 magnitude range up to sevens and, you know, even eight
21 magnitude. So, we felt that it was more appropriate
22 to realign that to the original intent of the CAV
23 filtering.

24 And in addition, the CEUS-SSC, the maximum
25 magnitude range for the sources, we believe, will

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1 probably go down to 5.5. So, again we're looking at
2 whether CAV filtering should occur over the maximum
3 magnitude range.

4 So, for sources in the Central and Eastern
5 US, the maximum magnitude range is, I believe, going
6 to be from five-and-a-half up to eight - approximately
7 eight.

8 And then the third reason is we - our
9 ground motion prediction equations are less certain
10 for higher magnitudes. Definitely we don't have data
11 for six or sevens - upper sixes and sevens in the
12 Eastern US.

13 So, for that reason we felt it more
14 appropriate to limit CAV filtering to the smaller
15 magnitudes.

16 MS. KEITHLINE: Okay. Thank you.

17 And I would turn and look at Don and Greg
18 to see if they have either follow-up questions on
19 those that I tried to ask, or better, new, different
20 questions on what you've discussed so far.

21 MR. MOORE: I just have one question.

22 I think in Slide 9 you're talking about
23 seismic hazard evaluation and comparing the GMRS with
24 the SSE.

25 We were wondering -- there is - have been

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1 evaluations performed for IPEEE where we had a Review
2 Level Earthquake. And I was wondering if that was -
3 could also be used as a screening evaluation.

4 Is that something that you have
5 considered?

6 DR. MUNSON: Well, I think we've considered
7 multiple options. And the latest one that we thought
8 was probably the most appropriate, was a comparison of
9 the GMRS with the SSE.

10 Definitely, that's what started the whole
11 GI-199 in the first place was looking at this for ESPs
12 and COLs.

13 I don't know if, Jon, if you had -

14 MR. AKE: No, we're still developing
15 specific guidance on what else would be done beyond
16 that.

17 At this point, we clearly see that that's
18 a comparison that will be probably very useful and
19 potentially beneficial to limit the number of plants
20 we would have to do more detailed assessments for.

21 MR. MOORE: I appreciate that.

22 We were just - there is - have been a
23 number of plants that have - I evaluated their plants
24 like at 0.3 G and well above their SSE.

25 And if - our feeling is if that data -

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1 EPRI - I mean, the IPEEE data/information is properly
2 documented and shown to still apply, that that would
3 be a reasonable comparison to the GMRS.

4 MR. AKE: Those are things we will be
5 continuing to look at as we move forward.

6 MR. HARDY: Just a couple of questions. I
7 guess kind of a follow-up to Kimberly's on this CAV
8 filtering.

9 It's been the subject of quite a bit of
10 discussion in the past. And so, I'm just curious -
11 it's one of the items we talked about doing kind of a
12 joint research project on to try to figure out if
13 there's a better way to characterize it, but certainly
14 it's got some traction in the work we did previously
15 for new plants.

16 So, the way it was utilized there is
17 presumably different from what you're now talking
18 about a little bit.

19 I don't know if that will affect previous
20 studies done or not, but it's certainly worth
21 discussion.

22 Sounds like you are not there in terms of
23 your own thinking on what ought to be done exactly.
24 So, it might be an area we continue talking about in
25 terms of kind of jointly impacting not only this

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1 program, but potentially the new plants which have
2 already done quite a bit of work and would be a
3 nontrivial impact, I think, just to go back and
4 reevaluate.

5 So, I guess that's just a comment out for
6 your consideration. Certainly welcome that
7 discussion, and we've got some people that have done
8 quite a bit of work on it that could probably be
9 helpful in discussing it.

10 The other thing I see here, just this term
11 for site amplification. I think we're in agreement
12 that can make - a difference maker, so to speak. But
13 the term "base on original site investigations," I'm
14 assuming - I'm taking that to mean existing
15 information available now.

16 You're basically telling us we don't have
17 to go out and do the borings, as opposed to places
18 that have new information from the original from
19 whatever reason they've done - it's sort of like use
20 what you've got. The best available; is that right?

21 MR. AKE: That's correct. That's our
22 position now.

23 MR. HARDY: Okay. The last item is minor,
24 but I guess everything here has talked about CEUS, but
25 I think the wording and the latest is all US plants

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1 are going to be subject to GI-199.

2 So if that's the case, I guess we have
3 some Western plants in attendance and on the phone.
4 If there's anything particular to them -

5 MR. HILAND: Let me answer that question.

6 MR. HARDY: Okay.

7 MR. HILAND: You know, three years ago when
8 we started, I had a real good answer why I'm focusing
9 on 96 plants and not 104. That answer got harder and
10 harder to provide over the years.

11 In particular, my research colleague over
12 here, Mr. Coe, has challenged me to continue that
13 answer, but we do recognize that there are significant
14 efforts ongoing at, at least four reactor sites. And
15 that's the - well, four units at Diablo Canyon and San
16 Onofre.

17 And, you know, we're involved and we've
18 seen that - I think San Onofre just submitted a new
19 Seismic Margin Analysis. And Diablo Canyon is going
20 through some licensing process.

21 And we'll monitor that and we'll look at
22 the Washington plant and the Palo Verdes just to see
23 if in fact there's a benefit of including them in the
24 GI-199.

25 Well, that's not an absolute, you know.

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1 I'm not going to make an absolute statement we're
2 going to include or exclude the plants.

3 But, you know, we got it out there is that
4 we're sounding it amongst ourselves that should we be
5 paying attention?

6 And I think that two of the sites with the
7 four units, they probably have enough oversight from
8 the owned onsite -- or the state activities with our
9 oversight of that, I'd say today that I probably
10 wouldn't look very hard. But the other units, maybe
11 we ought to look at them. Just haven't made that
12 decision yet.

13 MR. HARDY: Okay. The only other item, I
14 guess, is Slide 7 has got some very general topic
15 areas. I'm assuming later on in the presentation we
16 will expand these a bit, I mean, these hazard curves
17 Jon and Cliff talked about.

18 But in terms of what's expected for the
19 rest of these, you know, fragility information is a
20 very broad category of things. It could be almost
21 anything and it excludes presumably the use of seismic
22 margin studies which I know later you're going to talk
23 about.

24 So, I'm not going to go into these right
25 now, but I guess at some point I'm hoping later we'll

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1 discuss a little more on what you're envisioning in
2 each of these areas.

3 MR. HILAND: Could I - I'd like to ask a
4 question of my staff here.

5 Just as a layperson, could you give us a
6 couple-minute definition of the cumulative absolute
7 value filtering just so everybody in the room -- when
8 we say the CAV filtering -- I know you've done this
9 for me before. But if you could do that, maybe it
10 will help everybody in the audience to understand what
11 specifically we're talking about.

12 You've been successful in the past,
13 explaining this to me.

14 MR. AKE: It is a - it's essentially an
15 integrating - it's a metric that integrates an
16 acceleration time history. Specifically, it looks at
17 the - integrating the contribution or, you know,
18 summing up the contributions to that integral over
19 some small amplitude value that's considered to be a
20 non-damaging threshold.

21 And in terms of units of the earth's
22 gravity, that value is 0.025 G. In other words, it's
23 a very small level of ground shaking. So, it only
24 integrates that acceleration time history over that
25 range.

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1 MR. HILAND: So, using that CAV filtering
2 does what?

3 MR. AKE: Do you want to take -

4 MR. HILAND: Just a layman's explanation.

5 MR. AKE: That integrated value when we
6 look at comparisons of observed damage in earthquakes
7 in terms of that integrated value, the so-called CAV
8 value, we find that there seems to be a threshold at
9 about some value, the integrated value of 0.16 G
10 seconds. Odd units. Forgive me, but those are the
11 units that we tend to put this in.

12 Below that threshold, we note very low
13 probability of damage or no damage. And above that,
14 we see increasingly high value in damage indicators in
15 the built infrastructure specifically for engineered
16 structures, okay?

17 So, the application of the CAV filter
18 represents for each different magnitude bin of
19 earthquakes, what fraction of those earthquakes appear
20 to have - exceed that threshold value.

21 And then essentially it contributes - or
22 reduces the contribution in that magnitude bin by the
23 fraction of those events that are observed to have CAV
24 values beyond that threshold.

25 So, for very small magnitude events, we

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1 see a large fraction of those events fail to achieve
2 that threshold value. So, we would remove a large
3 fraction of those events from contributing to a
4 seismic hazard.

5 And as you get to larger and larger
6 magnitude events, a higher and higher fraction of the
7 events contribute to that - exceed that CAV value and
8 then are included in the hazard calculation.

9 DR. MUNSON: If I could just try to make it
10 even simpler, previously when we did seismic hazard
11 evaluations we used a magnitude cutoff. If the
12 scenario earthquake is below Magnitude 5, we don't
13 include it. It's out.

14 Now, instead of using that magnitude
15 cutoff, we're using a more sophisticated CAV, what we
16 call a CAV filter, and a CAV is a damage-indicating
17 parameter.

18 So, we look at these scenario earthquakes
19 and we say what kind of CAV value are we going to get
20 from those?

21 And then we attach a probability, and that
22 filters out the lower, non-damaging earthquakes.

23 MR. HILAND: Thank you.

24 MR. HARDY: One follow-up to that, I guess,
25 is - so, you're right, Cliff. Obviously the

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1 traditional way is to have a hard cliff, kind of
2 pardon the pun, but cutoff value of some magnitude.
3 And defining what magnitude you're talking about can
4 kind of be interesting, also.

5 So, if you guys have gone at least to the
6 point of thinking about a 5.5 to 5.75, you've probably
7 done a few sensitivity studies for different kinds of
8 situations looking at the three -- the old-style step
9 function cutoff, versus CAV as it's been interpreted
10 to date, versus this new proposal.

11 Just rough lessons learned or thoughts,
12 well, what are the fundamental differences between
13 those three at a place like Charleston and a place
14 away from it, and give us a feel kind of how much
15 difference this makes, if any.

16 DR. MUNSON: I think you're probably giving
17 us too much credit for how much we've actually done on
18 this so far.

19 But like I said, our original thoughts
20 were, you know, the CAV filter was intended for
21 smaller magnitudes. And so, we kind of want to try to
22 focus it more in that area. We haven't decided, as
23 Jon said, on a value yet.

24 I know, you know, in terms of what you're
25 saying with the minimum magnitude, I mean, obviously

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1 that value will actually affect the hazard curve in
2 itself.

3 So, we know that at about ten to the minus
4 five whether you use CAV filtering or not, it's going
5 to have pretty much the same hazard value. So, we
6 know the curves usually join at that point.

7 If the curves are bent by CAV filtering,
8 we do have the GMRS determined by using 45 percent of
9 ten to the minus five. So, we feel like we do have
10 some allowances by using that kind of safeguard.

11 MR. HARDY: Yes, just if it weren't going
12 to make any difference, that's great. If it does,
13 then we've got to think about it. I just didn't know
14 if you guys had got down the line far enough.

15 And obviously you probably wouldn't go
16 down this recommendation if it didn't make a
17 difference in at least some sites.

18 MR. CHOKSHI: Cliff, the SSE paper
19 discusses some of these things. Might be useful to
20 look at that presentation.

21 DR. MUNSON: You'll have to jot it down. I
22 wouldn't mind getting a copy of that.

23 MR. CHOKSHI: Provide a copy for you.

24 Can I - you said that there might be
25 questions from the Western sites. I would suggest

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1 that let's go out and get the questions on the table.

2 MR. HARDY: I don't know if questions, but
3 interest. They're certainly parties to the
4 conversation. And I guess that's - you clarified and
5 I had heard maybe it was old news, but there was some
6 thoughts of adding GI-199 to all sites.

7 So, maybe that's not the case. You're
8 still on that decision point. That really was my
9 question.

10 MR. CHOKSHI: Okay.

11 MR. HARDY: And all I saw was CEUS kinds of
12 thoughts. So, I didn't want to have that group be
13 slighted, so to speak. But sounds like that's not
14 quite decided if that's part of GI-199 yet.

15 MR. HILAND: Yes, that's correct.

16 I was at a meeting, it was a public
17 meeting a couple of weeks ago. And Pacific Gas and
18 Electric - I believe they have representatives here
19 today - they were going through some of their
20 activities.

21 And, you know, what they're doing with
22 their oversight state group is probably at least
23 equivalent, if not beyond, what the GI-199 would hope
24 to capture.

25 They're doing a seismic margin analysis.

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1 They're doing a probability risk analysis, a PRA
2 analysis on the site. They're doing both. And they
3 have quite a complicated, as you know, seismic
4 background that they have to evaluate.

5 So, you know, looking at that, what value
6 would I be adding by including them? But I'm going to
7 look and see what the results of this SSE methodology
8 is and go through and - I won't exclude them today.

9 DR. MUNSON: I have a question since we can
10 turn the tables a little bit.

11 We were recently made aware of EPRI doing
12 a study similar to what we had on Slides 8 and 9, only
13 not using the CEUS-SSC, obviously, because it's not
14 ready.

15 Perhaps you could illuminate us a little
16 bit on that.

17 MS. KEITHLINE: I think we'd have to ask
18 Bob Kassawara from EPRI to come up to a microphone.
19 We may not be completely familiar with what he's doing
20 or has done recently if it's for a certain
21 organization.

22 MR. KASSAWARA: Yes, tell me again what it
23 is you're referring to?

24 DR. MUNSON: I guess seismic hazard PSHAs
25 are being done at each of the plant sites using USGS

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1 2008 EPRI ground motions with site amplification
2 functions being developed for each of the sites.

3 MR. KASSAWARA: Yes, that's actually work
4 that's being done for a vendor, and it's in progress.
5 We should be done within a matter of weeks.

6 MR. AKE: Could we ask specifically what
7 your - do you have any idea what you're doing for the
8 site amplification functions for that?

9 MR. KASSAWARA: It's the ones that we've
10 been using all along. The ones that we used for the
11 previous studies that you and I have talked about.
12 They haven't changed.

13 DR. MUNSON: So, it's not the method that
14 we're using right now for COLs and ESPs where you
15 actually develop - do sixty trial runs and estimate
16 the uncertainty and what method tier or whatever to
17 actually come up with the site amplification, but
18 you're actually using just values that you've already
19 determined previously in the past?

20 MR. KASSAWARA: Well, they are - they are
21 frequency dependant and amplitude dependant, but it -
22 they haven't changed from the ones that we did, say, a
23 year or two ago that we've compared with you.

24 I don't know if that answers your
25 question, but there isn't any new and exciting

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1 amplification factor calculation.

2 DR. MUNSON: I think what I was referring
3 to was the very older ones that were done.

4 MR. KASSAWARA: Oh, no, no, no.

5 DR. MUNSON: So, these are newer values?

6 MR. KASSAWARA: The newest ones we have.

7 MS. KEITHLINE: Yes, just to be clear
8 though, that work that Bob is describing, he's not
9 doing, I believe, for the utilities. It's being done
10 for one vendor who's got some specific interest.

11 MR. KASSAWARA: Yes. They want to judge
12 how their design matches up against the best
13 information that they can come up with as to, you
14 know, where could they site a plant and where could
15 they - where would they have difficulties.

16 And as you said, it's not the CEUS. It's
17 USGS hazard or characterization, and the EPRI 2004-6
18 attenuation model.

19 DR. MUNSON: Thank you.

20 MR. MOORE: This is Don Moore. I have kind
21 of a follow-up question on Slide 8.

22 We agree that site amplifications are
23 important. And based on original site investigations,
24 some of that data is not specifically developed for
25 site amplifications.

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1 And I'm assuming that NRC's expectation is
2 that the licensee would go through and review that
3 data and try to update it. Not necessarily doing
4 borings, but do an update determining where a really
5 hard rock is and approximate soil properties with
6 property-appropriate uncertainties.

7 DR. MUNSON: Yes, definitely. I think, you
8 know, as some of the new reactor applicants have done,
9 they've used well information from, you know, in the
10 region to try to get a hard rock depth.

11 And certainly, you know, whatever
12 velocities you do have from your original
13 investigations.

14 MR. AKE: Yes, and that's where we were
15 emphasizing the, you know, the need in areas, you
16 know, that those represented state-of-the-practice at
17 the time they were licensed. And it's different than
18 what we would say we would prefer to see today.

19 So, recognizing that there is somewhat
20 less information there that we have to work with, that
21 that implies somewhat higher degree of uncertainty
22 that needs to be captured, you know, represented and
23 captured in the development of the site amplification
24 functions.

25 MR. MOORE: And I think one other area you

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1 mentioned had different elevations.

2 Here again are we talking about like at
3 the free ground surface and maybe in a free field
4 foundation level? Is that the kind of hazard curves
5 that you'll be expecting?

6 MR. AKE: Right.

7 MR. MOORE: Okay.

8 MR. AKE: And we would need - obviously we
9 would like the results at an elevation that
10 facilitates an easy comparison with the SSE --

11 MR. MOORE: Sure.

12 MR. AKE: -- in terms of what elevation
13 that was developed for because that will be one of the
14 key things we'll be making comparisons with.

15 MR. MOORE: So, a licensee would have to
16 make sure they understand exactly where their SSE is
17 defined for their licensing basis.

18 MR. AKE: Yes.

19 MR. MOORE: Okay. Thank you.

20 MR. CHOKSHI: Also, that hazard will be
21 used in the subsequent evaluation. So, it's multiple
22 users.

23 MR. HARDY: Just a note almost to remind
24 myself to come back to it though, you mentioned this
25 NGA East being completed sometime three to four years

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1 down the road, which I think is going to end up
2 tailing right into the end of this program, which
3 means you'll spiral right into another kind of
4 evaluation.

5 And hard to know where that's going to go,
6 but one of the things you're going to hear later on is
7 this - we'll have a discussion, a schedule of what
8 makes sense.

9 So, I think we might want to come back to
10 that issue and think about it because in some sites
11 that NGA East may make a difference, and I'd hate to
12 see people go through a big analysis and find out it
13 flipped back the other way when that information was
14 available.

15 So, just a - we'll talk later, but
16 obviously everybody agrees if that study were to be
17 done at the end of the year coincident with the one
18 that's going on SSE right now, we'd be using that
19 information. You'd have the best available
20 information.

21 So, to move ahead on that and knowing that
22 there's a program that update and may make some
23 material differences, is one of the considerations and
24 questions we have that we want to talk a little more
25 about.

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1 MS. GLENN: All right. Do we have any
2 other questions from the table?

3 (No response.)

4 MS. GLENN: All right. Do we have any
5 questions from folks in the well?

6 All right. Please introduce yourself.

7 MR. WHORTON: Good morning. My name is Bob
8 Whorton with South Carolina Electric and Gas Company.

9 And I have a follow-up question on Slide 9 relative
10 to the comparison of the GMRS and the SSE similar to
11 Don's, but with a slightly different approach.

12 As you're all aware, the SSEs developed
13 for the original sites were typically based on the Reg
14 Guide 1.60-type spectra. And when we conducted the
15 IPEEEs in the '90s, many of the Review Level
16 Earthquake spectra were based on the NUREG-0098 shape.

17 Now, we have the new sites, COLs, ESPs,
18 and some GMRS have been developed for some of those
19 sites and we are seeing a different frequency range of
20 peaks relative to the spectra.

21 So, the question is if we try to do any
22 comparisons of current GMRS with SSE, has the NRC
23 staff considered some frequency cutoffs of comparison
24 of interest in any areas that we've battled this high-
25 frequency issue for thirty years that I've been

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1 involved in and we can't ever seem to reach some
2 resolution on what the impact is?

3 So, the cutoff would be of interest to the
4 industry.

5 DR. MUNSON: Well, definitely we haven't -
6 I mean, we do want to do this hazard - this screening
7 evaluation because, you know, it doesn't make sense
8 for plants that have very low GMRS values compared to
9 their SSEs, to have to do the full Risk Assessment,
10 but we haven't really decided yet in terms of how this
11 is going to be nuanced in terms of the frequency of
12 exceedance and what that might mean for further
13 evaluation.

14 MR. CHOKSHI: One other thing is we need to
15 think about is we know the damage potential -- of
16 certain frequency, but how it might affect all results
17 of a risk analysis. And how do you account for the
18 changes in the sequences or the contributors?

19 So I think that needs to be also, you know
20 -- ultimate use of the information coming out is it
21 affected by anyway.

22 MR. MANOLY: I don't think we have a solid
23 number yet. We like to hear your views on that.

24 DR. MUNSON: Yes, we would actually like to
25 hear some of your thoughts on this screening we're

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1 proposing, you know. We're not -- we haven't made our
2 -- reached a decision yet on that.

3 MR. WHORTON: Unfortunately, we don't have
4 Dr. Kennedy here who could properly articulate on this
5 very well.

6 In the - from an industry perspective, you
7 know, we have been looking at where is the damaging
8 affects of earthquakes? And I think, in general, we
9 believe ten hertz and below is where most of the
10 damage from earthquake occurs.

11 And what we have seen historically, high-
12 frequency motions at the above ten hertz to the 25
13 hertz range are typically only impacting sensitive
14 electrical type equipment.

15 And you're aware that in IPEEE, we did
16 screening to either eliminate what we call the bad
17 actor relays and other components.

18 So, you know, we have gone down this path
19 a few times and it - we're afraid with the deltas of
20 the comparisons of the spectra, you know, it could
21 raise this issue back beyond where it should be.

22 So, you know, I guess an industry
23 perspective is should we really be focusing on less
24 than ten hertz as the primary frequency range of
25 interest?

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1 MR. MOORE: I'd like to follow with what
2 Bob said.

3 We did have Bob Kennedy work with us. We
4 came up in preparing for this meeting, looking at
5 different options and the frequency range is an
6 important issue.

7 The frequency range of the new hazard
8 related to, say, the GMRS is significantly - in most
9 sites, significantly different than the SSE and that
10 typically the new GMRSes are in the high frequency
11 range.

12 So, the question comes to us and we think
13 it's an important one, is that when we evaluate the
14 comparison between the SSE or the Review Level
15 Earthquake to the new, say, GMRS based on a new
16 hazard, what we want to do is try to identify what is
17 - where is the - where do we need to be spending our
18 efforts in doing the evaluation and in recognizing
19 the, you know, the models that we have existing for
20 our existing plants and how - what level of effort
21 that's needed.

22 I have here in front of me some work
23 that's been done by ASE for -- that talks about high
24 frequencies. And they basically support the comments
25 made by Bob Kennedy and Bob Whorton.

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1 And so, this is an important area for us
2 to consider so that we can use our resources
3 appropriately.

4 MS. GLENN: All right. Next Question.
5 Please introduce yourself.

6 MR. KASSAWARA: Which I didn't do last
7 time. I'm Bob Kassawara from EPRI.

8 I just wondered if Jon or Cliff could give
9 us a little more detail about the purpose of
10 performing a de-aggregation on high and low-frequency
11 Controlling Earthquakes.

12 DR. MUNSON: Well, that was basically
13 that's kind of our link back to the deterministic
14 past.

15 So, looking at Controlling Earthquakes
16 would be a comparison to the earthquake that was used
17 for the deterministic siting comparison of the
18 magnitude and distance with what was used for
19 developing the original SSE.

20 MR. KASSAWARA: Would you somehow separate
21 those out when you're comparing to the deterministic
22 SSE?

23 I mean, is that related to what Bob
24 Whorton was talking about with, you know, high
25 frequency and lack of damage?

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1 DR. MUNSON: No, it's not. It's not
2 related to that. That's just, you know, that's
3 basically part of the process that we do for -
4 obviously for new reactors as developing Controlling
5 Earthquakes.

6 And it's not like a major need that we
7 have, but we are interested in comparing Controlling
8 Earthquakes with original maximum earthquakes that
9 were used.

10 MS. GLENN: Does that answer your question?

11 MR. KASSAWARA: Yes.

12 MS. GLENN: Okay. Are there any other
13 questions from the folks in the well?

14 (No response.)

15 MS. GLENN: Okay. I'd like to open up the
16 floor for the folks who are in the room. I can bring
17 the mic to you or you can approach the mics yourself.

18 MR. SMALL: Thank you. My name is Alex
19 Small from Optimal Design, waste management
20 consultant.

21 And I have a question that it might be my
22 inaccurate perception, but all the information that
23 was presented was developed before the events in
24 Japan.

25 Are there any lesson learned from the

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1 events there that maybe need to be included in the
2 future development?

3 And I understand that from seismic point
4 of view, the stations in Japan did very well. And
5 most of the failures, though, are still related to
6 that initial seismic event.

7 MR. HILAND: Right. Yes, let me answer
8 that.

9 As you may be aware, the NRC has a task
10 force that was developed to take a look at the
11 Fukushima event.

12 That task force provided their first
13 public discussion with the Commission. I believe it
14 was last week or maybe a couple days before that, and
15 that was the first thirty days.

16 And they'll have another presentation
17 after sixty days. And then a final - it's a 90-day
18 task force.

19 We have no information that we're
20 including today in our efforts on GI-199. The
21 survival of Fukushima reactors for the Site 1 is
22 unknown. They don't know whether the sites today,
23 whether the sites suffered any significant damage or
24 not from the earthquake. And, you know, that will
25 come and time will tell.

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1 As you may be aware, the NRC had a group
2 of officials or inspectors, whatever, monitors that
3 went over to Tokyo to assist the US Ambassador, you
4 know, Day 1 after the events at Fukushima. We sent
5 two, and then we had as many as 11 there over the
6 previous three months.

7 Now, today we still have a large
8 contingent in the Ambassador's offices supporting him
9 in his interest of US citizens living in Japan.

10 we did close down our operations center
11 over the weekend. And we set up a special team of six
12 staff people, six or seven. And they actually work in
13 this building on the ninth floor.

14 And my Deputy Director, David Skeen, is
15 leading that team. And he has a manager and several
16 risk analysts and experts there to support. And
17 they're there to support our team that is still in
18 Japan, but it's premature to answer your question.

19 We don't know if the task force - they're
20 looking into all the details. They may give us some
21 insights that we don't know. It's going to be a long
22 time in telling as far as whether there is any affects
23 from the earthquake on the sites. We don't know.

24 MR. KASSAWARA: This is Bob Kassawara.

25 While we can't say for certain that there

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1 was no seismic-related damage at Fukushima, we do have
2 one other data point, and that was the earthquake that
3 occurred in Kashiwazaki in 2007.

4 The earthquake there nominally - the
5 plants or at least one of the units experienced almost
6 three times its design. And there we do know that
7 there was essentially - absolutely no safety-related
8 damage.

9 They had a lot of peripheral damage, fire,
10 fire lines, things like that, but there was no safety-
11 related damage. So, it's possible that the situation
12 in Fukushima will be the same.

13 There was, I think, 55 minutes between the
14 earthquake and the tsunami at Unit 1. And what we -
15 EPRI studies earthquakes quite extensively. And what
16 we'll be looking for is to see if there's any way we
17 can find out if there was damage in that 55 minutes.
18 After that, well, all bets are off.

19 MR. HILAND: Let me just add - I'm sorry.
20 I may have left an impression that the NRC acted
21 alone, and that's not the case.

22 Our response center was in communication
23 with what we call a consortium of industry, as well as
24 government agencies. And I may miss them, but EPRI
25 was certainly one of them, as well as Department of

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1 Energy, Naval Reactors, INPO. And all of those
2 agencies we spoke to at least twice when I was on
3 shift during the day, during the 24-hour period for
4 the first two months.

5 And what we were communicating was the
6 information we were receiving. We were asking for,
7 you know, brainstorming. Brainstorming suggestions
8 that we could give to our Ambassador regarding the US
9 citizens in Japan, as well as to NISA, the Japanese
10 regulators and others.

11 So, I apologize. When you picked the
12 phone up, I was remiss in recognizing that there were
13 a number of parties that supported our effort, as well
14 as their own effort.

15 MS. GLENN: Thank you.

16 MR. KIMBALL: I'm Jeff Kimball. I'm a
17 seismologist with the Defense Nuclear Facilities
18 Safety Board.

19 I guess I have a question for Cliff and
20 Jon related to the site response methodology piece,
21 which I think is going to be very important.

22 It seems that methodology-wise the NUREG-
23 6728 now is approaching ten years old. The work that
24 went into the NUREG is probably older than that by,
25 you know, a couple years.

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1 So, I guess the question is are you
2 envisioning a single methodology to be applied on the
3 site response?

4 And given that the - that it has two
5 components, the amplification function component and
6 then the hazard consistent motions at whatever surface
7 you're - it is - do you have a stable methodology
8 that's current that should be - that can be applied, I
9 guess, consistently from place to place?

10 Seems to me, Approach 2 and 3 in the old
11 methodology - I guess my question is has it been
12 tested enough to have a stable understanding of how
13 site response should be put into the equation?

14 MR. AKE: Yes, we feel that the approach
15 outlined in 6728, specifically Approach 2 or 3, would
16 be the desired path forward.

17 MS. GLENN: Okay. Other questions?

18 MR. ABRAHAMSON: Hi. I'm Norm Abrahamson.
19 I'm a seismologist with Pacific Gas and Electric, and
20 involved in the Diablo Canyon plant.

21 My main comment for you is that the
22 Generic Issue 199 is going beyond just the Eastern
23 plants.

24 Our view is you're really establishing how
25 do you address new seismic information? And to that

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1 extent, we think this ought to apply to all of the
2 plants in that we use consistent approaches and
3 methodologies, and not have different things being
4 done in the west and the east.

5 So, we would encourage you to be - address
6 the broad, generic issue of what do you do with new
7 seismic information? Because that's going to keep
8 happening, you know.

9 Ten years down the line we'll have new
10 seismic information. And if we have at least a
11 process to go through that's consistent, then we'll be
12 able to apply it.

13 MR. AKE: Thanks, Norm. That is part of
14 the discussion, internal discussions we're having on
15 the path forward in developing specific, you know,
16 recommendations for plants in the Western US. That's
17 one of the key things we'll be looking at.

18 MS. GLENN: Okay. Next question.

19 MR. LETTIS: Hi. This is Bill Lettis with
20 Fugro William Lettis and Associates. And a question
21 for Jon and Cliff.

22 On - and it's just a point of
23 clarification. On Slide 9, you make the statement
24 "develop performance-based Ground Motion Response
25 Spectra using Reg Guide 1.208."

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1 That's a very broad statement and taken
2 out of - it invokes Reg Guide 1.208 in a very broad
3 sense, which entails a lot of work.

4 Earlier on Slide 8 you provide important
5 constraints, use Central Eastern US, no additional
6 site-specific information is needed, use existing site
7 data to develop your site profile, but there are other
8 parts of Reg Guide 1.208 that could be invoked.

9 So, just for clarification on the record,
10 since this slide is on the record, could you clarify
11 just what part of Reg Guide 1.208 you're invoking when
12 you say "develop the GMRS?"

13 DR. MUNSON: That was with reference to the
14 performance-based equations that are in 1.208. We
15 certainly don't expect the utilities to have to do a
16 detailed geologic evaluation that's in 1.208 - similar
17 to what's in 1.208.

18 MS. GLENN: All right. Next question.

19 (No response.)

20 MS. GLENN: All right. Can we open up the
21 phone lines for any questions from remote
22 participants?

23 MR. BHARGAVA: This is Divakar Bhargava
24 from Dominion.

25 I think, Greg, earlier referred to Slide 7

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1 where you had some -- four pieces of information that
2 you might request from each utility.

3 And could you elaborate on those, the
4 fragility and three other items on that slide, please?

5 DR. MUNSON: That's to come later.
6 Nilesch will elaborate on those and we have more slides
7 to go over those issues.

8 MR. BHARGAVA: Thank you.

9 MR. HONG: Good morning, folks. My name is
10 Haney Hong. I'm a graduate student at the Harvard
11 Kennedy School sitting in on this meeting, but I just
12 had a question, if I may, on the - I think it was on
13 Slide 8. And there was a comment made about the 2008
14 US Geological Survey information.

15 I was just trying to understand a little
16 bit better why it is that this information does not
17 apply to or it is not what you all want to use in the
18 GI-199 evaluation. Thanks.

19 MR. AKE: Yes, we used that in our existing
20 Safety/Risk Assessment that was conducted for this
21 issue previously simply because it was easily
22 available and supplied us with some consistent process
23 we could apply across all 96 plants in the Eastern US.

24 However, there are a number of significant
25 details that are more thoroughly developed and

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1 evaluated in the new model than in the existing USGS
2 model.

3 Their product is developed for a specific
4 use for building codes which are at a different annual
5 frequency of exceedance than we are interested in.

6 We're interested in more remote events, if
7 you will. And some of the uncertainties - the
8 treatment of some of the uncertainties are, we think,
9 better developed in the new model than the USGS model.

10 MS. KEITHLINE: Does that answer your
11 question, caller?

12 MR. HONG: Yes, thanks.

13 MS. KEITHLINE: Are there any other
14 questions from the phones?

15 (No response.)

16 MS. KEITHLINE: Okay. We have one question
17 that was emailed in. I'll let Jonathan read that.

18 MR. ROWLEY: Yes, this message - question
19 is from Frank Bellini.

20 Was the CEUS-SSC schedule originally for
21 delivery in March 2011?

22 DR. MUNSON: I think it was for -

23 MR. HILAND: Let me answer that.

24 I put out some information at the October
25 public meeting that in fact I did expect the CEUS-SSC

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1 to come out in the spring time frame.

2 Now, I'll let Dr. Munson tell you why it's
3 a little bit longer.

4 (Laughter.)

5 DR. MUNSON: I think I should make Jon
6 answer this question.

7 MR. AKE: Actually, I'm not sure the caller
8 -- or the email is correct. I believe the original
9 schedule was for March of 2010, not March of 2011.

10 DR. MUNSON: For the end of the year, 2010.

11 MR. AKE: Okay. Right. Yes.

12 As with all large projects, there have
13 been scheduling challenges that have arisen. And at
14 this point, we feel some reasonable confidence it will
15 be at the end of this year.

16 MR. HARDY: I think it's prudent to
17 remember those words, Jon, because later on we're
18 going to talk about a few scheduling challenges for a
19 large project that's the subject of today's meeting.

20 MR. ROWLEY: Mr. Bellini's second question
21 was will slides be available online after the meeting?
22 And I'll answer that.

23 The answer is yes. They will be part of
24 our meeting summary which will be issued within thirty
25 days of this meeting.

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1 And if you need them sooner, you can just
2 email me, jonathan.rowley@nrc.gov, and I will send
3 them to you via email. These will be publicly
4 available in our ADAMS system within twenty days, as
5 mentioned as part of our meeting summary. Sooner, if
6 you need it. Just send me an email.

7 TELEPHONE PARTICIPANT: For those of us on
8 the telephone, would you mind spelling your email
9 address, please?

10 MR. ROWLEY: Jonathan, J-O-N-A-T-H-A-N,
11 dot, Rowley, R-O-W-L-E-Y, at NRC.gov.

12 TELEPHONE PARTICIPANT: Thank you, sir.

13 MS. GLENN: Thank you.

14 Last call for any questions from the
15 bridge.

16 (No response.)

17 MS. GLENN: All right. Thank you. We can
18 mute that line again, please.

19 Any other questions from the room?

20 (No response.)

21 MS. GLENN: Okay. If there are no other
22 questions, Jon, did you have something?

23 MR. AKE: No.

24 MS. GLENN: If there are no other questions
25 for this section, we will have additional

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1 opportunities throughout the day.

2 We're going to go ahead and take a 15-
3 minute break. Before everyone stampedes, please, we
4 tend to lose some participants at the breaks. So,
5 feel free to get a meeting evaluation form if you
6 don't intend to joins us for the next section.

7 And, also, please note that there is no
8 food or beverage permitted in this room. So, if you
9 have a snack or a drink, please finish it before you
10 return.

11 And on that note, we'll come back at
12 10:35. Thank you.

13 (Whereupon, the above-entitled matter went
14 off the record at 10:20 a.m. and went back on the
15 record at 10:38 a.m.)

16 MS. GLENN: All right. We're going to go
17 ahead and get started again. Before we resume our
18 slide presentation, I'm going to open up the floor one
19 more time for any comments.

20 We open the floor for questions. They're
21 not necessarily being differentiated. But if anyone
22 has a comment that they would like to contribute?

23 MR. AKE: Thank you. I'm asleep at the
24 wheel here. Yes, we just wanted to make one
25 clarifying comment.

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1 On Slide 8 where we discuss the Central
2 and Eastern US-Seismic Source Characterization model
3 and the sub-bullet there says "local refinements
4 unnecessary," we just want to make it very clear that
5 that particular sub-bullet applies only to the
6 utilization of that source model with respect to
7 resolving Generic Issue 199. And it should not be
8 interpreted to mean that that's not required for new
9 submittals. Thank you.

10 MS. GLENN: All right. Thank you. We'll
11 open up the phone lines briefly one more time.

12 MR. MANOLY: I just want to make a comment.
13 I got some questions during the break.
14 Some individuals who think that the slides are maybe
15 driving the discussion in a certain direction, I want
16 you to feel comfortable to express your views. And if
17 you have different ideas, bring them to the table and
18 don't hold back, okay? Thank you.

19 MS. GLENN: Thank you. Are there any other
20 comments from -

21 MR. MCGUIRE: This is Robin McGuire.
22 Can you hear me?

23 MS. GLENN: Yes, we can.

24 MR. MCGUIRE: A question on one of the
25 slides. And sorry I'm on the webinar and I don't have

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1 slide numbers, but it had to do with screening on the
2 basis of hazard.

3 And a question for Jon Ake, I presume that
4 any recommendations on hardware changes or plant
5 improvements would not be based on hazard, it would be
6 based on risk.

7 And along those lines, have you
8 established or thought about or can you share any
9 ideas with us on what risk criteria or risk thresholds
10 you might be using in the future to make those
11 decisions on actual plant changes?

12 MR. AKE: I mean, yes, you're correct that
13 those changes would be, you know, informed by the
14 risk, but we have not established or developed
15 anything like that.

16 Now, Marty, do you want to -

17 MR. STUTZKE: Yes. In general, the
18 criteria to decide to make plant improvements, we
19 would follow our regulatory analysis process that's
20 laid out in NUREG/BR-0058 which talks about value
21 impact studies like that.

22 So in principle, one would look at the
23 change in risk that would be created by an improvement
24 and monetize that, and then compare it to the cost of
25 implementation.

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1 MR. MCGUIRE: Okay. Thank you.

2 MS. GLENN: All right. Any other comments
3 or questions from the bridge line?

4 (No response.)

5 MS. GLENN: All right. Let's go ahead and
6 mute the line then.

7 Before we move on, I also would like to
8 make a note for the folks on the bridge. If you would
9 like to be listed with the attendees in the
10 documentation for this meeting, please send an email
11 to Jonathan Rowley, R-O-W-L-E-Y, at nrc.gov.

12 And also for the folks in the room if you
13 haven't signed a sign-in sheet, please make sure you
14 do so. It's located to my right around the corner.
15 You'll have another opportunity at the break.

16 Having said all that, we'll go back to our
17 discussion beginning with Slide Number 10.

18 MR. CHOKSHI: All right. Good morning.
19 I'm sure that the next few slides are going to be a
20 source of considerable discussion during the course of
21 the day.

22 We talked about - Ben presented Slide 7
23 where he talked about high-level information need and
24 we follow this Generic Issue. And Jon talked about
25 one component of that hazard and the methods we have

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1 used to develop that information.

2 Now, in order to have a more comprehensive
3 discussion about the matters for the rest of the
4 information, our thought is to do maybe we talk about
5 the attributes the method should have before we jump
6 into the discussion of methods.

7 And then that will facilitate in all the -
8 - and then after discussing that, we should go talk
9 about available methods, what might be other options,
10 any other options.

11 And I think as Kamal mentioned, I think -
12 and Pat said this is very important that we get
13 feedback. And if you have any thoughts, please, you
14 know, during the discussion, provide that feedback to
15 us, okay?

16 So, I'm going to do my - for the next
17 three slides is going to cover -- discuss the
18 attributes. So, I'm going to maybe after that, maybe
19 a point of discussion. So, let me start with that
20 Slide 10, okay?

21 To me, one of the first and foremost
22 attribute is that as shown here is the - that the
23 method should be capable of being applied consistently
24 and uniformly across the plants.

25 There are a number of considerations goes

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1 into that, I think, attribute, but two of them I have
2 listed here.

3 After all said and done, you know, whether
4 is necessary or not or we like it or not, people will
5 compare results and draw conclusions, you know. There
6 are all sort of stakeholders involved in this, okay.

7 And I think for many reasons but actually
8 it's very important -- that the methodology be
9 consistently applied so that when the evaluations are
10 conducted, they are consistent, the findings are
11 consistent. And as I've shown here, the comparison of
12 results meaningful. It provides something or at least
13 it is never relative comparisons.

14 The part about the ASME/ANS standard in
15 part goes to the issue of the consistency, you know.
16 That's why we have standards so that you can at least
17 do to the extent practical, well, their approaches are
18 consistent. And that I think having the standard and
19 the associated guidance, Reg Guide 1.200 is important
20 to consideration.

21 One other thing I think the ASME/ANS
22 standard to me is very important leads to the issue of
23 quality, you know. Because it's being - it's a
24 consistent standard, has gone through I think at least
25 is also shows consistent level of quality. And I

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1 think it -- there are other standards generally, you
2 know, gives you good set of comments.

3 Now, I think other thing for reason for
4 use to following a standard is the standard to a great
5 extent reflects past practices, as well as the lessons
6 learned from those past practices, you know.

7 The standard was developed after the
8 IPEEEs were conducted and reviews were conducted by
9 NRC and industry. And we learn a lot of things,
10 insights.

11 And, you know, being, you know, holding
12 the standard, that was one of the focus that, you
13 know, that all of this be captured in a consistent
14 manner into the standard.

15 So, I think that's the - those are the, I
16 think, and that consistency to me is a pretty critical
17 attribute.

18 And whatever we do, it should be
19 uniformly. And I think that's one of the reason why
20 the discussion of hazard was very focused on that
21 consistency aspect.

22 The second bullet refers to the - I think
23 the two of the key information we needed more info
24 with regulatory analysis.

25 Marty just answered a question about what

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1 type of information at least in determining in further
2 using regulatory analysis.

3 The measures of plant risk in core -- in
4 terms of core damage frequency and understanding
5 containment is performance necessary for going -
6 moving forward into the regulatory analysis.

7 I think it's also in doing the regulatory
8 analysis, I think you need to look at the total risk,
9 you know. That is part of the evaluation.

10 You need to understand how does this risk
11 compare also with the total risk and with the other
12 initiators.

13 So, having the robust measures I think
14 robust enough so that when people make comparisons,
15 those comparisons are robust. And also it can be used
16 subsequently into the regulatory analysis at the
17 important attributes.

18 And then as we later see, little later
19 I'll discuss in the next slides that, you know, it
20 will be good to have a method which can be extended to
21 the Level 2 or Level 3 type of insights if you want to
22 fully understand the progression of the events and
23 potential responses and to cope with the events.

24 So, let me go to the next slide. Okay,
25 these two bullets goes toward understanding total

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1 plant response to the seismic event such as the
2 insights are very comprehensive and not only focused
3 on the seismic capacity.

4 It focuses on the total plant system
5 models which will - how the plant will perform during
6 a seismic event.

7 I think to me the - you've got a very
8 limited insight just by focusing on the seismic
9 capacity side of -- only because as we have seen in --
10 PRAs, we use up both safety systems and non-safety
11 systems are part of the integrated model, and it's
12 very important to incorporate to understand a more
13 realistic understanding of the behavior on how the -
14 what systems get utilized or how the accident
15 progresses and what, you know, how we can cope with
16 it.

17 And that's, you know, the second sub-
18 bullet is to - I think it's probably very critical
19 information in terms of developing any accident
20 mitigation or any strategies.

21 The next bullet is again going back to
22 this total plant response. The PRA models or the risk
23 models surely have, you know, not only the assessment
24 of seismic capacity, but equipment reliability,
25 operator actions, the human factors part, you know,

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1 human factors aspects and as-built conditions.

2 Because that - if you don't do that, you
3 not necessarily are defining all the potential - all
4 of the contributors to the accident sequences.

5 And also I think more importantly, you
6 might miss the potential improvements which may go
7 beyond just hardware.

8 And I think we have seen in a number of
9 risk assessment applications, that trainings and
10 operating procedures and those things are important in
11 sites, okay.

12 So, it's I think in order to get a total
13 picture and fully do the comprehensive regulatory
14 analysis, it will be desirable to the, you know, to
15 have these attributes.

16 Let's go to the next slide. Okay. I
17 think the first question I think is really - it's an
18 important - it's not necessarily - it's done by same
19 methodology or same models, but the - but what total
20 evaluation methodology it should be capable of
21 addressing the affects of such a seismic-induced
22 floods and fires.

23 It's an important, you know, and then -
24 now, generally the approaches are used a little bit
25 different, you know, in how do we deal with that. But

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1 I think identification of those potential such effects
2 and how we deal with it. It should be an important
3 part of the - any approach.

4 That is also the - in my first bullet, we
5 talk about the spent fuel pool sequences. And that's
6 something I think I'm sure there's going to be a lot
7 of discussion.

8 And that's at this point in time, I think
9 we are considering, but - am I stating right? Spent
10 fuel pool?

11 So, you know, yes. So, it's good to know,
12 you know, what are the thoughts and things, okay.
13 Right.

14 I should have had the next bullet actually
15 further up in the - because I think this is important,
16 but I also want you to make sure that you understand
17 this in what context.

18 This is in the context of getting the good
19 risk insights, okay. When I talk about realistic, in
20 PR the realistic is -- as what's necessary in order to
21 get good insights, you know. Just doesn't mean that
22 either the best modeling of the three-dimensional
23 multi-finite element is to capture what is germane to
24 the -- getting the - identifying contributors and
25 having robust resource, but you want the change in the

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1 ground motion.

2 I think it's very important that whatever
3 method is being used, it takes into account. I think
4 that's one of the - the thing we talked about, the
5 fragility information, okay. And I think when we are
6 doing the screening analysis, what we found that not
7 having fragility information impeded us and which I'll
8 talk about the next bullet, in getting some more real,
9 more robust estimates of the change in the risk type
10 of things.

11 So, we can just make some initial
12 assessment of the new information, how it would, you
13 know, would have - and I think going forward, that
14 should be the goal.

15 And I think I heard earlier the comments
16 about consistency of their approaches. And we know in
17 this area, new information is not news. It happens,
18 and it will happen, you know.

19 It's the 2014 ground motion model, that's
20 one. We don't -- there might be things - I don't
21 know. We don't know what's going to come out from
22 other, you know.

23 And I think having a capability that you
24 can make a quick assessment and which you can rely on
25 will go a long way to even that whether you will have

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1 to identify Generic Issue all the time as new
2 information comes.

3 You may be able to build that within more
4 consistent and quick manner. So, I think that last
5 bullet is - and I think we have talked about this. I
6 think everybody would - I don't think anybody would
7 disagree to that attribute.

8 But I think so that we do the selection of
9 the method, I think we should all the information need
10 we put together, we should think about why, I mean,
11 that we can achieve that goal.

12 And I think the part of the fragility,
13 need for the fragility information in part stems from
14 that. That having ability - well, it will also be
15 necessary for us to go a regulatory analysis for this
16 going forward for this issue, but it will also help us
17 in future.

18 So, these are the - I mean, I'm sure there
19 are other attributes and other considerations people
20 have, you know. But you wanted us to put some of the
21 key ones we thought on the table, so we could have a
22 discussion around that, you know.

23 And because with this, I think this and we
24 can look at method, available methods or any other
25 options we may want to go to in terms of these

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1 attributes, how -- how they can meet the intent of
2 some of those things we want or we desire.

3 So with this, I'll stop with the
4 discussion of attributes, and it is the time for a
5 discussion.

6 MS. KEITHLINE: We can ask questions now?

7 Okay, this is Kimberly Keithline from NEI.
8 Niles, going back to Slide 10 in the first bullet
9 about should be - an attribute is that the methodology
10 should be able to be applied consistently and
11 uniformly across the plants.

12 I certainly understand, I think, that
13 desire. And my only question is that, is that also
14 consistent with the thought that there may not be a
15 generic solution for all plants?

16 In other words, is - we talked at the very
17 beginning about that this is an interesting Generic
18 Issue because it may have site-specific solutions.

19 And I think one of the things we're
20 thinking about is that as we go forward, there may be
21 a graded approach. There may be a way to do some
22 screening so that I just want to make sure that this
23 first bullet about applying it consistently and
24 uniformly might also allow for some type of graded
25 approach or some type of consistent or commensurate

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1 with the level of risk or safety involved with certain
2 situations.

3 MR. CHOKSHI: Yes, whatever the approaches
4 we come up - and as I said, we talked about some
5 screening criteria and stuff.

6 But I think in the end of the day, you
7 know, if certain plants need certain things, the
8 method should be consistent.

9 Because, you know, there is going to be
10 tendency to - and may -- we may have to look at
11 results in aggregation and total. And also for plant-
12 specific application, I think the results - otherwise
13 you are not applying condition criteria when we do our
14 regulatory analysis.

15 So, I think, you know, and that's why I
16 had mentioned about standard. These are all site-
17 specific, plant-specific analysis, but they should be
18 done in terms of the level of detail, specific
19 assumptions, underlying approaches in a consistent
20 manner.

21 MS. KEITHLINE: So, just to make sure I'm
22 following, my understanding has been that in the past,
23 certain sites may do more detailed, involved analysis
24 depending on what the seismic hazard is in a
25 particular region. And that that seems to be a

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1 somewhat logical approach to it that you focus on the
2 areas where there's the most risk or the most hazard.

3 Would this allow - talking about
4 consistency and uniformly, would that still be able to
5 be accomplished in a way that would allow a little bit
6 -

7 MR. CHOKSHI: Let me, I guess, give you an
8 example. Let's let the people do site selection or do
9 seismic PRA, I would like some level of consistency
10 how those plants do the seismic PRA, because other,
11 you know, and as you say that in the PRAs, level of
12 detail depends on what you find.

13 It's an intricate process. It's perfectly
14 as you are to discover, you detail your analysis to
15 that.

16 But I think in terms of basic assumptions,
17 basic requirements, they need to follow - otherwise
18 you will -- it becomes very difficult to look at those
19 results and make any sense out of it.

20 MR. MARION: Nilesch, if I may, I'm Alex
21 Marion, NEI, and I apologize for arriving late. You
22 may have covered this in the introduction.

23 In terms of the attributes of the plant
24 evaluation methodologies, is this your expectations or
25 plan going forward focusing on resolution of GI-199,

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1 or is it broader than just GI-199 at this point?

2 If you covered that in the introduction, I
3 apologize.

4 MR. HILAND: Yes, this is - yes, we're
5 focusing on GI-199. And the discussion Nilesh had, we
6 hope we want to hear some feedback and dialog.

7 These are, you know, our experts. We sat
8 around a table for several days and they came up with
9 here's the attributes. And we gleaned them down to
10 the ones we thought were significant that we could
11 bring to the table and we're looking for feedback.

12 Did we miss some? Is there an attribute -
13 and that is a very good question. My personal
14 opinion, and I'll get shot, is I think we ought to use
15 a graded approach depending on - but I understand
16 Nilesh's concern that it could be graded, but, you
17 know, we ought to have some consistency and maybe
18 groups is what we're talking about or -- I don't know,
19 but we're looking for some help. We're looking for
20 feedback and a dialog.

21 MR. MARION: Thank you.

22 MR. MOORE: Hi, this is Don Moore.

23 Nilesh, looking at your Slides 10 through
24 12, it appears to me that meeting all this criteria
25 really just leads you to a seismic PRA, I mean, to be

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1 able to have all these attributes.

2 MR. CHOKSHI: I mean, that's clearly the
3 seismic PRA will meet all of the, you know, because
4 the risk analysis - but what I think we are looking
5 for, we are looking for feedback that - that's why I
6 said intent of these attributes that you can use.
7 Tell us that in your view there are other ways to meet
8 some attributes of this, you know.

9 So, that was the type of feedback, you
10 know, and we are not closing door on any discussion on
11 our end. We have, as we said, this is the feedback
12 meeting. And we haven't really made up decisions on
13 any of these issues yet.

14 MR. MOORE: To kind of follow up what
15 Kimberly was saying was that, you know, when I see the
16 words "applied consistently," you know, there's ninety
17 plants or whatever. And it would - are you the intent
18 here to be that all plants would do exactly the same
19 thing?

20 I think a graded approach is what we were
21 thinking was the most effective way to respond to the
22 issue in an efficient and -

23 MR. CHOKSHI: Don, I think what we are
24 trying to say that we don't want 96 different
25 approach, okay?

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1 MR. MOORE: Sure. Right.

2 MR. CHOKSHI: We want - suppose we came up
3 with a grouping of two, three, okay? Within those
4 groups, it needs to be consistent.

5 Otherwise I think you, you know, you
6 creating ad hoc approaches and it becomes very
7 difficult.

8 MR. MOORE: I appreciate that. Thank you.

9 And I guess just I'm trying to understand
10 on Slide 12, the second bullet, "Should realistically
11 reflect effects of current ground motion in response
12 and fragilities."

13 And I guess the issue here "realistically
14 reflect" as we discussed earlier, the new ground
15 motions that we would get from the current hazards in
16 central and eastern US would reflect that the ground
17 motion would be more - have more energy in the high
18 frequency range.

19 And so, therefore, realistically
20 reflecting ground motion in responses would indicate
21 upgrading models, structural models or -

22 MR. CHOKSHI: Again, I think that's why
23 when I would say that you need to put the context of
24 how it affects our resource.

25 I think one of the things, a challenge

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1 with different ground motion is to that the essential
2 question are the sequences will be different if my
3 fragilities get changed, okay.

4 MR. MOORE: Sure.

5 MR. CHOKSHI: Because with the response
6 spectra shape we are using, lot of low-frequency
7 components will tend to dominate and will have these
8 insights remain the same. And those are the type of
9 insights we are lacking when we are doing screening
10 analysis.

11 So, I think the intent here is to look at
12 it so that when we come out with the revised models,
13 they realistically reflect the accident sequences, the
14 contributors, you know, and they reflect the new
15 ground motion -- effects of new ground motion.

16 MR. MOORE: And one last clarification
17 here.

18 From a deterministic view, one could maybe
19 screen out and determine that the plant has, you know,
20 we define a new margin that we do. The plant has a
21 certain design margin above its design basis, but this
22 is - you're not looking at it in a deterministic way.

23 It seems that what the NRC wants is a risk-informed
24 assessment so that they can look at and make judgments
25 in regards to possible upgrades.

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1 MR. CHOKSHI: Thank you.

2 MR. MOORE: Okay.

3 MR. CHOKSHI: And following the Generic
4 Issue process as Marty talked about, yes.

5 MR. MANOLY: I got a question for - I guess
6 Kimberly mentioned about grouping plants.

7 Can you elaborate more what you're
8 thinking in terms of -- are you talking seismic
9 margin? You're talking about seismic PRA?

10 MS. KEITHLINE: To go on the record, I'm
11 not locked into deciding that every plant needs a
12 seismic PRA right now. So, I didn't necessarily mean
13 by PRA - I was thinking more in terms of the hazard
14 levels or some type of grouping like had previously
15 been done as part of the IPEEE trying to decide where
16 the areas are, where the sites are that it might make
17 sense or be appropriate to look at a different level
18 of detail than certain other places.

19 Just a real general thought in my own mind
20 that these guys would develop much more fully in a
21 more detailed manner, I think.

22 MR. MOORE: Kamal, one of the things we
23 were looking at is how the ranking was done for IPEEE.

24 There was, you know, you had full scope, reduced
25 scope and focused scope and you had seismic PRA. And

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1 those rankings were based on perceived seismic hazard.

2 And so we were, you know, discussing
3 yesterday in our pre-meeting about something similar
4 to this and maybe that would be an approach.

5 There could be plants where seismic hazard
6 is very low and maybe there is - makes -- the best use
7 of the resources would be something different than a
8 plant that has, you know, is a higher seismic zone,
9 has a higher hazard now based on the new PSA change.

10 DR. MUNSON: And let me reiterate those are
11 our thinking right now, also, that we would do the
12 screening.

13 We didn't want to make decisions based on
14 what was done for IPEEE. In other words, if you did a
15 margin then, you can do margins now. We wanted to
16 make that decision based on a current evaluation of
17 the hazard.

18 MR. HILAND: I hate to enter into these
19 discussions because of my lack of technical expertise,
20 but I'll go ahead.

21 And remember our Safety and Risk
22 Assessment Report, you know, the reason we decided to
23 continue was we had a number of plants, 27 plants in
24 our defined continue range.

25 And I went back and I did look at what

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1 those plants had done for the IPEEE, and it's a
2 diverse listing. Some did a seismic PRA. Some did a
3 seismic margin. Some did a modified margin or
4 enhanced - and yet they're still in our continued
5 range, this grouping.

6 So, I think it's important that, you know,
7 we look at those. I'm asking for my experts here to
8 jump in and save me. My save a friend here or phone a
9 friend.

10 Is that I'm not excluding looking first at
11 this group. And so we - whatever is done, you know,
12 we ought to focus in that group first. And some of
13 the higher or greater risk plants I would certainly
14 look at first if their data comes in, in whatever
15 we're asking for if we get that information.

16 So, I'm a little hesitant to say if you
17 did a seismic margin analysis twenty years ago, it's
18 okay to do a seismic margin analysis today. I'd have
19 to go back and look.

20 And I would hope the industry and the
21 plant - this report's been out for nine months now.
22 And hopefully it's been read by some of the
23 facilities. I think everybody in this room can say
24 that.

25 A very good report. A lot of work went

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1 into it. The change in seismic core damage frequency
2 is what we analyzed and I'm hesitant to accept this
3 flat blanket. I need explanation.

4 If I've got a plant or even a plant that's
5 just a little bit outside of our range, I'd like to
6 know why I would exclude an analysis to do a cost
7 beneficial backfit on that plant.

8 And that's what we're here for is we need
9 this information. I'm certain all the licensees would
10 like to know if they have a high risk. And if they
11 have a high risk, what would it cost to fix it?

12 In some cases, it may be something that
13 they would chose to do before they even came back to
14 us. I don't know.

15 MR. CHOKSHI: Actually I think I like to
16 make two points. I think first of all -- criteria
17 that if your SSE is below -- is basically hazard-based
18 -- and second thing I think as Pat alluded, low
19 hazard does not necessarily mean low risk. You need
20 to make that bridge. Okay, that's - because it
21 depends on the plant-specific situation.

22 So, I think in order to make a - for us to
23 do a full evaluation, you know, low hazard not
24 necessarily guarantees that it always - okay.

25 MR. MANOLY: I'd like to add that for the

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1 IPEEE, the Review Level Earthquake that was used by
2 different plants or the groupings, some of the
3 groupings and the choice of RLE didn't have enough
4 rigor in it at the time.

5 And I think we're looking for more rigor
6 in the selection of RLE if that's a thought that
7 you're pursuing.

8 MS. KEITHLINE: Yes, I think all that makes
9 sense. And I don't think that we would propose simply
10 taking the binnings or groupings that were done for
11 the IPEEE that long ago and just using those going
12 forward.

13 That with the new information, there has
14 to be some thought process to what the different
15 groups might be or what the different levels of hazard
16 or risk might be that would steer you in a particular
17 direction for one specific option versus another, or
18 level of detail that would then be pursued for those.

19 MR. CHOKSHI: I think let me say this,
20 because we going to move to the discussion of methods
21 in a minute.

22 But what I like to do is rather than
23 discuss, you know, particularly IPEEE or something,
24 look at the methods in discussing terms of attributes,
25 you know, because I don't think at this point we're

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1 going to have, you know, we can make decisions on the
2 methods.

3 But I think in terms of we need to look at
4 how does it help us with the GI process? Does it get
5 us there at all?

6 So, and that's what the next slide is
7 going to right there to that issue, okay.

8 MS. GLENN: All right. Additional comments
9 from the table, please?

10 MR. HARDY: Yes, I think we will as Nileshe
11 said - and this is Greg Hardy, but we will talk more
12 about these methods. So, I'm not going to spend much
13 time.

14 But the consistencies within a grouping,
15 the industry is assuming there will be a path to use
16 SPRA and a path to use margins. And that's what we'll
17 talk about later.

18 But on Slide 11, I guess a little
19 clarification here on this, what the model will
20 include.

21 Almost from this wording, I can almost
22 interpret this as a desire to have a model that
23 includes all levels of PRA. Not just a Level 1 or a
24 Level 1.5 that includes a LERF.

25 Was that the intention of this?

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1 MR. CHOKSHI: No, I think this applies to
2 any level that you may have both system, both safety
3 systems and non-safety systems for the Level 1, Level
4 2, Level 3, okay.

5 So, this was not directly saying, but it -
6 - gets all how the plant will respond, how all the
7 systems operator may realize it's in the model.

8 MR. HARDY: So, the word "accident
9 progression and post-accident response," that -

10 MR. CHOKSHI: It allows you to go to that,
11 you know. If you want to -- like, for example, like
12 this is if you come out at end of Level 1, and if you
13 want Level 2, you need those things.

14 MR. HARDY: Certainly in the long run. I
15 guess if we're talking GI-199, I'm not sure we're
16 thinking of going that far.

17 MR. CHOKSHI: Well, that's one of the
18 things we needed to explore because in terms of plant-
19 specific improvements, okay, are these the level of
20 things we need to go to or we need to go to look at
21 some of - the next bullet just goes more toward
22 traditional things of the hardware implements or the
23 reliability type of issues.

24 That's why I wanted to put it on the table
25 and let's see what you're thinking.

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1 MR. MOORE: Niles, the end product of
2 these slides, the attributes, is what you end up
3 requesting now is a consistent estimation of the
4 seismic core damage frequency is what you're looking
5 for.

6 MR. CHOKSHI: That's - to me, that's
7 paramount I think because that is critical. And,
8 Marty, you can elaborate on that, but that's
9 definitely key information, I think.

10 MR. STUTZKE: Yes, a couple of thoughts
11 here, you know, to go back to Slide 10 and the
12 discussion of Reg Guide 1.200 a little bit.

13 The expectation of the NRC is that any PRA
14 that is done to support a risk-informed application,
15 the quality of that PRA should be commensurate with
16 the role that that PRA plays in our regulatory
17 decision-making process.

18 And since we are using a risk-informed
19 process that puts a heavy weight on the PRA, when we
20 talk about the quality of the PRA, three attributes
21 come to mind; the scope, the level of detail and the
22 technical adequacy.

23 And of course one expects it to be
24 technically adequate regardless of the scope or level
25 of detail. That just means there's no mistakes in it,

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1 things like that.

2 Reg Guide 1.200, being a Reg Guide
3 provides one acceptable way to meet the NRC's
4 expectations with respect to quality.

5 And inside that Reg Guide it provides
6 different ways to achieve that. One is compliance
7 with the standard, okay.

8 I'll point out in passing, we'll pick this
9 up later on, Reg Guide 1.200 does not endorse the
10 seismic margins portion of that standard. Because
11 seismic margins by the NRC's definition, is not
12 considered to be a PRA. It doesn't provide
13 quantitative estimates of risk directly. Rather, it
14 provides information that can be manipulated.

15 Moving on to the issue of Level 1 PRA
16 versus Level 2 or Level 3, I've been asked before by
17 Robin McGuire, let's elaborate a little bit on that.

18 When we do a regulatory analysis, it's
19 basically a value impact study. A cost-benefit study
20 that's consistent with the backfit rule 10 CFR 50.109.

21 Examples of value impact studies are
22 provided in license renewal submittals, the review of
23 SAMA, severe accident mitigation alternative, okay.

24 To build up the value, okay, we look at
25 things like the averred and public exposure. So,

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1 that's the change in person rem, the population that
2 is over the 50-mile radius around the plant.

3 We look at the change in averted offsite
4 cost again fifty miles around the plant. The change
5 in averted occupational exposure.

6 When you look at how those things are
7 actually calculated, to get averted population
8 exposure I need delta person rem which implies a Level
9 3 type of study. The same thing with averted offsite
10 cost.

11 Now, we have in our Regulatory Analysis
12 Handbook that's NUREG/BR-0184, if I remember right,
13 factors that were derived from NUREG-1150 that says if
14 I know the change in CDF, I multiply it by the right
15 factor and I get the change in person rem, okay.
16 Similarly, I can do that for the change in averted
17 offsite cost.

18 When I look at the factors in that
19 NUREG/BR and I compare them to what I see in SAMA
20 analysis, I see a pretty large discrepancy. And it's
21 not surprising because NUREG-1150 was based on certain
22 assumptions about modeling population surrounding the
23 sites and things like that.

24 So, that gives one pause for concern as to
25 how that I can do that to come up with the averted

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1 things that I need in there.

2 The other thing that I would point out is,
3 you know, even if I were to use the results of a SAMA
4 analysis directly, those are based on internal events.

5 And these factors are in fact frequency-weighted
6 factors that give me person rem per core damage
7 accident. But the frequency weights are the internal
8 event sequences, not the externals.

9 For example, in the PWR they are heavily
10 skewed towards the fact that the risk is caused by
11 things like steam generator tube rupture or
12 interfacing system LOCAs.

13 Well, can a seismic event induce a steam
14 generator tube rupture? Yes, but probably the
15 likelihood is not so much. So, one begins to question
16 this.

17 The other thing that one would have to be
18 careful of is the seismic event may directly damage
19 the containment. And that wouldn't be factored into
20 those things.

21 So, we have to be very careful about those
22 factors and whether we can glean something useful out
23 of the old NUREG/BR. I mean, they certainly - there
24 are numbers there, but the Level 3 sorts of aspects of
25 seismic events aren't well know. They're not well

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1 studied, okay, like this.

2 One more thought I'll throw out there is
3 that of course when we compute these factors, we
4 calculate these factors so I get something like person
5 rem per core damage accident, I have to monetize it.
6 So, we have this magic \$2,000 per person rem, okay.

7 We are currently doing research now to
8 assess the value of statistical life that would in
9 fact may change that \$2,000 per person rem. That
10 research has just been underway, but it may be done at
11 the time when we get the Generic Letter out.

12 That was a mouthful.

13 MS. KEITHLINE: Is there a takeaway from -
14 I mean, you seem to point out several areas of
15 uncertainty or questions about how to apply existing
16 guidance to these types of decisions that we might
17 face related to GI-199.

18 Is there going to be a and-here's-what-we-
19 can-do-about-that, or are you looking for suggestions
20 or feedback?

21 MR. STUTZKE: Kimberly, my ears are open.

22 MS. KEITHLINE: Okay.

23 MR. CHOKSHI: I think that my, you know, I
24 think this discussion -- I would say that our
25 understanding of accident progression so you know what

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1 assumptions you are making going forward or what you
2 can make, how can you adjust some things.

3 So, if you had that understanding, I think
4 it will go a long way, you know, like sequence. I
5 think it does help to put your core damage in the
6 context of what are the scenario.

7 MS. KEITHLINE: That's a pretty big scope.
8 That's -

9 MR. CHOKSHI: Well, no. I mean, that
10 doesn't mean that you - you talk about doing Level 2
11 or Level 3, but how did you get to the core damage and
12 whether there wasn't associated containment failure or
13 not would go towards, you know, I think help - and,
14 Marty, tell me if I'm wrong, but that will help inform
15 his analysis.

16 MR. STUTZKE: Well, for example, if the
17 nature of the concern is we know from like Reg Guide
18 1.174, our surrogate risk metrics are things like core
19 damage frequency and large early release frequency.

20 Open up NUREG/BR-0058 and do a word search
21 for L-E-R-F. Zero hits. That tells me there's some
22 sort of discrepancy, you know, between what we
23 currently understand and what we need, you know, we
24 use in risk-informed applications versus what we need
25 to do in order to proceed with the regulatory

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1 analysis.

2 MR. MARION: You raise some interesting
3 points. I wouldn't characterize them as
4 discrepancies.

5 I think, you know, this plant evaluation
6 methodology, that's why I asked the question about its
7 applicability to GI-199 because the attributes you
8 identified, as Kimberly indicated, have an application
9 that's much broader than just seismic.

10 And, you know, for what it's worth, it
11 seems to me that in light of recent events as part of
12 the evaluation that the NRC is conducting, there are a
13 number of aspects of existing programs and activities
14 that come into play here that go beyond seismic severe
15 management guidance, et cetera, et cetera.

16 And one of the things that should occur,
17 and I'm not necessarily identifying this as a
18 takeaway, but ultimately the NRC and the industry has
19 to come to grips with it, is whether or not there's
20 sufficient guidance out there to deal with what we
21 understand can happen at these sites with some level
22 of reasonable confidence.

23 And we need to sit back and look at some
24 of the guidance that Marty referred to and see if it
25 needs to be updated based upon our current

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1 understandings and state of knowledge. Just take it
2 for what it's worth.

3 MR. HARDY: Just to follow up on that
4 question, and I was sort of expecting that might have
5 been your answer, but this - a complete Level 2, Level
6 3 assessment or even using inferences to go there in
7 seismic as you freely admitted has not been well
8 studied, we've had discussions with the NRC on kind of
9 a joint research in that area.

10 And I think there is a potential avenue to
11 do that, but I think it's an area for further
12 discussion because I think you're going down a line
13 that may not be as simple as you think.

14 This is not a trivial issue as recent
15 events might have indicated. And so I think we've
16 done a pilot review of the SPRA standard for a Level 1
17 with a few beyond Level 1 kinds of considerations, but
18 we're not even - and we'll talk later about maybe what
19 other things are going to happen here in research
20 mode, but this is even farther out there.

21 So, how you would use it, I think there's
22 going to have to be some discussion here. It's more
23 in the research mode than even everything else we've
24 talked about so far and needs some thought.

25 MR. CHOKSHI: But I think Level 1, that

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1 should not be - that has been in practice for last
2 thirty years. So, the -

3 MR. HARDY: Yes, I think this is really a
4 talk beyond the -

5 MR. CHOKSHI: As you say, Level 3 we
6 haven't done that many. There are very few done very
7 early in the '80s.

8 But, yes, I think this was going to that.
9 That's why we have this handbook. And I think it was
10 just explaining what - how do we use it and what are
11 the things we need to be aware of.

12 MR. HARDY: You're one of the authors of
13 the standard, too. I don't believe it goes to that
14 level of Level 3.

15 MR. CHOKSHI: Well, the whole ASME/ANS is
16 Level 1 with some containment.

17 MR. HARDY: That's right.

18 MR. CHOKSHI: Okay.

19 MR. HARDY: So, I think your desire to have
20 that as your guiding light is a bit -

21 MR. CHOKSHI: Well, no. I understand there
22 is a Level 2 is already - I don't know whether it's on
23 the street or not.

24 MR. STUTZKE: In draft.

25 MR. CHOKSHI: It's in draft, right. Yes.

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1 MR. STUTZKE: Level 3 is in draft.

2 MR. HARDY: I just want to bring that up.
3 You're treading on areas that I would consider still
4 in the development stage.

5 I guess in this last major bullet on Slide
6 11, I read that and it's all - I agree with everything
7 there, but I'd be interested if there were specific
8 references here you think that go beyond what one
9 might have done for IPEEE.

10 In other words, all of these things are
11 things we try to achieve in our IPEEE studies to some
12 degree. So, is there a message beyond that that there
13 are areas of improvement or -

14 MR. CHOKSHI: I think, yes. And in fact on
15 my - in one of the slides, I talk about some of the
16 limitations of some methods, I think.

17 It's a question of - one is a question of
18 rigor. Do you really get those insights, okay? I
19 mean, because like - in the method on success path
20 type of approach, you screen them, you never build it
21 into the model. So, you really have never evaluated.

22 The model doesn't go that far to know
23 whether that's even a consideration or not.

24 MR. HARDY: Well, I guess we'll come back
25 to that when we talk about the SMA approach and what

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1 is the area that -

2 MR. CHOKSHI: Yes.

3 MR. STUTZKE: And I would point out that
4 most of it - the IPEEE analysis of the containment was
5 largely qualitative.

6 There was kind of like a punchlist. The
7 one that sticks in my mind is go around and see if
8 your air lock seals are inflatable, rubber inflatable
9 seals, because they could possibly be damaged.

10 My very limited experience is when you
11 look at seismic Level 2 things, is people love to
12 build the big finite element model of a containment
13 structure. And that's all well and good. And of
14 course you find out it's very robust.

15 I've asked questions about penetrations,
16 differential motion and side penetrations and you get
17 leaks. And, gee, you know, people don't look at those
18 things too much.

19 One would like to think that when you've
20 looked at a Level 1 PRA, you know, you picked up
21 support systems, electrical power, perhaps surface
22 water, things like this. And so, you have some idea
23 of its seismic vulnerability.

24 There are other systems needed to keep the
25 containment in tact that simply haven't been examined.

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1 They doesn't necessarily appear on the equipment list
2 that's reviewed in like a seismic margins approach.

3 It's a matter of completeness.

4 MR. HARDY: These types of points are valid
5 for discussion, et cetera, and I agree with them.

6 Are you planning on writing a roadmap,
7 some kind of NUREG or something to guide people in
8 this process?

9 Because I can tell you, I mean, we had
10 Marty, we had you and Nilesch as part of kind of a
11 final of the review of the standard pilot that we did
12 for Surry. And I can tell you, you - the
13 interpretation of what you have to do to meet that
14 standard, and different people could do different
15 things to meet it are, you know, debatable.

16 So, to get a uniform approach is going to
17 be a challenge. Inclusion of things of just what you
18 mentioned, Marty, is kind of an interesting discussion
19 point and much beyond this kind of view graph.

20 Everybody could say they meet it and
21 you've provided your new fragilities. But how you
22 achieve that, the detail that you do to give what,
23 Nilesch, you have as Bullet 2 on Slide 12,
24 realistically reflect current ground motion in
25 responses and fragilities, that can be a reasonable

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1 amount of work, or a lot of work.

2 And we're all - people in new plants are
3 aware of the kinds of things people are doing to get
4 what some people might call reasonable responses.
5 Others might call unreasonable responses.

6 So, I guess that part merits a lot of
7 discussion in particular in terms of any schedule
8 impact, et cetera, that that might occur.

9 MR. CHOKSHI: I think I fully understand
10 what you're saying. And that's in the part why the
11 reference to standard that at least it takes on some
12 of it.

13 As you said, PRAs are subject to many ways
14 and you can't be worried of, you know, there's no -
15 there are no formulas in the standard to apply.

16 So, yes, I think that will be - I'm sure
17 we'll have dialog about some of the details as you
18 move forward and zero in on evaluation matters.

19 MR. MARION: If I may, Nilesh, I have a
20 question on Slide 12. In that last bullet you refer
21 to evaluating the "effects of new perception of
22 seismic hazard."

23 Could you elaborate on that, please?

24 MR. CHOKSHI: Yes, I think if you look at
25 the history of past, let's say, twenty years or since

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1 we have done Lawrence Livermore EPRI going back into
2 the late '80s, there has been changes of perception of
3 seismic hazard. Some new information. New models
4 have occurred and new data.

5 As the new - the EPRI applications came
6 in, this was like the Generic Issue-199, and we see
7 that this is - the first time it happen, it was
8 thought this was sort of a onetime thing.

9 But it looks - as we hear more and more
10 about the seismic events and things from the
11 Kashiwazaki and other places, we learn lot more and
12 people's perception change.

13 Does not necessarily mean the risk - any
14 affect on risk, but we need a tool you can quickly
15 assess the change in hazard.

16 So, we don't have to go through a very,
17 you know, there may not be no need at all to do
18 anything further than just know that there's new
19 information.

20 But the current - the experience in this
21 process was that we didn't have robust enough
22 information to get to that point.

23 MR. STUTZKE: Greg, to answer your question
24 on method, one of the things that we had talked with,
25 with my previous division director, Chris Lui, was

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1 whether we needed a how-to document similar to
2 NUREG/CR-5860 for fire PRA. And we would be
3 interested in a collaboration like with EPRI to try to
4 develop sudden methodology.

5 Obviously, that's not going to happen
6 before my vacation this summer. And we are also aware
7 of the limitations of 6850 when we tried to apply it
8 to the implementation of NFPA 805 and that a number of
9 questions have evolved with that.

10 So, developing, you know, I agree with
11 you. Developing a method would seem to be an
12 important, logical step, but it's going to take some
13 time to get it all nailed down, hammered out.

14 Once the method is done, then hopefully
15 you would smoke test it, pilot test it on a few plants
16 to see that it works.

17 These are all reasonable, technical things
18 to do, but meanwhile we've got schedule concerns, you
19 know.

20 MR. CHOKSHI: I think - Just I think Marty
21 had made a good point, but I would just little bit
22 elaborate that there's lot of existing guidance and
23 it's over the years.

24 But I think a lot of that is scheduled. I
25 think, you know, and then maybe the consideration of

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1 some of the information might be useful because I know
2 like EPRI spend lots of development in the fragility
3 area. Hazardous, looks like we have pretty much good
4 handle on that. It's focus of the joint efforts.

5 So, I'm reluctant to say that we need a
6 whole wholesale method development. It's
7 implementation guidance you need more than anything
8 else. You will work out some details, okay.

9 MR. HARDY: I had no - I agree. And I
10 certainly over the years, had a pretty good awareness
11 of this information that is available and we tried to
12 bring that to bear in our Surry pilot.

13 But given all this information available,
14 there's still a lot of decisions to be made and I am -
15 one of our goals would have been to have NRC be a peer
16 reviewer of sorts on it. And in our next pilot that
17 we are currently starting, we hope to have that to
18 kind of make sure our collective thinking on the
19 industry side is aligned with what the NRC is thinking
20 in these areas.

21 So, I understand the schedule concerns,
22 but I think I would echo that if you want product
23 that's going to have some uniformity, you would
24 probably be wise to do something to be able to
25 characterize it, because there is a wide variety of

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1 angles people could take on this.

2 And I won't go into those individual,
3 technical details, but it may not be as uniform as
4 you're thinking on this.

5 MR. CHOKSHI: I think that is real. And I
6 like to make one more point regards to method that,
7 you know, this - some of these methods have become -
8 the use in US is somewhat limited in recent years, but
9 there's been considerable experience internationally.

10 And there's lot of, you know, good work.
11 And in fact there was a conference in -- last November
12 in Japan. And Jim Johnson gave a good presentation on
13 some of the things we are doing now in the seismic
14 margin area.

15 So, there's a lot out there, you know. I
16 just don't want to leave the impression that this is
17 not - this is not new, okay.

18 Now, for specific application, you know,
19 the things and what information we need, how it needs
20 to be tailored to that need.

21 MR. HARDY: I guess the last item here is
22 on your last bullet on 12, and I think I jotted down
23 something. It would be nice to have the capability to
24 make quick assessments. And that's a goal.

25 MR. CHOKSHI: Right.

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1 MR. HARDY: I think we share that. We'd
2 like to have that capability, but I think again as new
3 hazard becomes available, defining where that break
4 is, where the similarity of shape is and - it gets
5 very complex in this nonlinear seismic response SSI
6 world.

7 So, again there is a challenge there that
8 would be nice to have some meeting of the minds on
9 what is the go/no-go on what's a significant change in
10 that.

11 MS. GLENN: All right. Are there any other
12 questions from the table?

13 (No response.)

14 MS. GLENN: Okay. Are there questions or
15 comments from the folks in the well?

16 Sir, introduce yourself.

17 MR. BRADLEY: Sure. Thanks. Biff Bradley,
18 NEI. I just had several questions regarding the use
19 of Reg Guide 1.200 for this purpose.

20 To correct slightly I think on something
21 Marty said, currently Reg Guide 1.200 is invoked
22 through Reg Guide 1.174 which applies to changes to
23 the CLB. It's not used to support all applications of
24 risk.

25 Because of that, 1.200 is a very rigorous

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1 approach as evidenced by what we're going through now
2 on NFPA 805 and fire, and has become a multi-year
3 effort with the, you know, recent decision by the
4 Commission to extend the schedule.

5 It's not really tailored to a quick or
6 semi-quick response to a Generic Letter. And, in
7 fact, NRC's current process wouldn't apply it to
8 anything other than a CLB change. So, I think that
9 needs to be thought through if anyone wants to comment
10 on that.

11 The second related point I'd like to make,
12 we sent a letter to NRC in May 2010, you know, NEI
13 representing the industry outlining our - some
14 concerns with the current Reg Guide and the standards
15 and the underlying methods for both fire and seismic.

16 And we provided in that letter a detailed
17 attachment with - this was a letter to Christiana Lui.

18 A detailed attachment with what we believed to be
19 realistic schedules for the conduct of these types of
20 studies, including the underlying methods development
21 that would be necessary.

22 I would note NRC has not responded to that
23 letter. And I would suggest you take a look at that
24 because I think there's some good, informative
25 information in there that might inform your

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1 consideration of whether you want to use that given
2 the - whatever timeliness considerations you may have
3 in mind.

4 Another comment I'd like to make is that
5 it doesn't appear to me there's a regulatory framework
6 out there for the use of this.

7 Assuming we all went out and developed
8 seismic PRAs, it's not clear to me what the decision
9 criteria are or the regulatory framework for using
10 that model to determine what's acceptable, what
11 changes might be needed.

12 For instance, the analog would be NFPA 805
13 for fire where you have an alternative regulatory
14 framework that says this is how you use risk.

15 There is no such thing in the seismic
16 world. So, we're going to be - if we did develop
17 this, we'd be sitting here with a PRA and it's not
18 really clear to me what the decision approach would be
19 or what you'd do with it.

20 If your intent is just to go directly to
21 use the backfit analysis, the NUREG/BRs that Marty was
22 alluding to, the criteria in those don't line up with
23 the criteria in 1.200.

24 And this was - I think Marty spoke to
25 this. 1.200 is looking at CDF and LERF. Your

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1 criteria are looking more at conditional containment
2 failure probability.

3 So, there's a - and I think this was
4 alluded to previously. There's a disconnect in what
5 1.200 does and the regulatory framework of the backfit
6 analysis that needs some recognition and possibly some
7 effort to pull those together.

8 I think that's all I wanted to say. I
9 think there's several - I think you've got to be
10 careful about invoking 1.200 here if your intent is to
11 have a timely solution that also meets the criteria of
12 the current regulatory framework which appears to be
13 the NUREGs that underlie the backfit rule. There's
14 some major disconnects.

15 And I'd also agree with what Greg just
16 noted that we haven't fully resolved the issues with
17 the use of the standard. The seismic portion of the
18 standard is currently under appeal within the ANS/ASME
19 organization.

20 There are significant questions that came
21 out of the Surry pilot that are currently unresolved.

22 And there's significant debate within the standards
23 community about how to resolve those.

24 So, just be aware of all these things in
25 your consideration of invoking 1.200 in the standard

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1 here.

2 It's not - these are not trivial issues
3 that need to be dealt with. Thanks.

4 MR. CHOKSHI: I think good comments on
5 1.200. I think that the thought was the quality --
6 that's why we are invoking.

7 Now, the other thing on the standard,
8 okay. I understand what is going on to the Standards
9 Committee, but there is a standard out on the street,
10 okay. There is 2007 or whatever the version, it's
11 already out there.

12 It's not that we haven't done seismic
13 PRAs. We have been doing that for thirty years. And
14 other peoples have done that.

15 So, saying because the standard is that,
16 you know, still there is a discussion going on,
17 doesn't mean that you can't do seismic PRAs. I just
18 want to make -

19 MR. BRADLEY: I fully agree, Nilesh. And
20 I'm not suggesting we can't do a seismic PRA. But I
21 think one thing we learned from NFPA 805, we could
22 also do a fire PRA before 805. But when you get into
23 a regulatory context where you're making decisions on
24 deltas and numerical thresholds, it's a different
25 animal than just doing a seismic PRA such as may have

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1 been done in Europe or wherever that you were alluding
2 to.

3 There's a tremendous learning curve we
4 went through on fire PRA in 805, and much of it will
5 apply here in the direction you're going.

6 MR. LAUR: This is Steve Laur, NRR. Just a
7 comment on the Reg Guide 1.200 and the changes to the
8 licensing basis that we want to call it.

9 But when the IPE and IPEEE studies were
10 done, we had no standards -- I should have said. And
11 with any regulatory submittal, there's a presumption
12 by us that there's some level of quality behind any
13 analysis you do.

14 There's talk way back in the IPEEE days of
15 do we - that's on, right? I can scoot up.

16 There's talk about you need to have
17 Appendix B quality programs for PRAs. There's a lot
18 of pushback and a lot of reasons why that wasn't
19 appropriate.

20 But the Reg Guide 1.200 recognizes the
21 national consensus standards, endorses them, and
22 provides a way of accepting - of demonstrating, as
23 Marty pointed out, adequate - technical adequacy of
24 the PRA.

25 So, I don't know why you - I'm not looking

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1 ahead saying we need to do a PRA or we don't. But if
2 the answer is you want to do a PRA in a regulatory
3 situation, I don't know why you would object to using
4 Reg Guide 1.200 and the standard for demonstrating the
5 quality.

6 And as it says in 1.200 in the
7 introduction, a peer review to the standard obviates
8 the need for detailed staff review of the base model.

9 And so that's the bottom line is if it's
10 something that does not have the standard and the peer
11 review and the Reg Guide 1.200 stamp on it, the staff
12 then has to do a much more detailed review to assess
13 the technical adequacy as being appropriate for the
14 regulatory application.

15 MR. BRADLEY: Okay, Steve. Thanks. And I
16 tried to elucidate some of my concerns. I wouldn't
17 call them objections, but I think there are issues
18 that have to be deal with relative to the use of 1.200
19 in this approach.

20 And I would note that the formal
21 regulatory process as it currently stands, applies
22 1.200 and 1.174 to CLB changes, not to any regulatory
23 application of PRA.

24 You guys are free to change that if you
25 want, but that's the current way that's set up.

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1 MR. LAUR: I believe the Commission's
2 policy statement on PRA has four points. I don't have
3 them memorized, but it talks about increasing use of
4 PRA in all regulatory applications to the extent
5 supported by the state of the art.

6 I believe that is where we invoke the
7 national consensus standards indirectly and the Reg
8 Guide 1.200 process, not just in changes to the
9 licensing basis.

10 I may be -

11 MR. BRADLEY: We go back and suggest you
12 read 1.174.

13 MR. COE: This is Doug Coe, Division of
14 Risk Analysis and Research. I think the points that
15 Biff made are good points to think about.

16 To add to what Steve Laur had indicated, I
17 think I'd just emphasize that the decision process
18 that we're talking about here does lead to a decision
19 whether or not the licensee or the license should be
20 changed, whether or not a backfit is appropriate.

21 So, at least from that perspective, there
22 is a similarity perhaps in licensing basis changes and
23 in the application of PRAs for that purpose as well.

24 But the discussion that we heard here
25 earlier does revolve around I think very

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1 appropriately, I think this is your point, Biff, that
2 we need to establish an understanding, a common
3 understanding of what we would expect in this
4 particular evaluation of the plant for the purpose of
5 the backfit analysis that Marty referred to.

6 I'll also point out that the issues that
7 Marty raised with respect to the backfit analysis will
8 have to be addressed at some point.

9 The staff if we were to come to a decision
10 that a backfit was cost justified based on the
11 existing regulatory analysis, there would be a lot of
12 individuals internal and external to the NRC that
13 would very quickly point out the kinds of things that
14 Marty mentioned or disconnects.

15 And ultimately if we were to take it to
16 the Commission that a backfit was warranted, the
17 Commission would want to make sure that it was -- that
18 the regulatory analysis guidelines were appropriate to
19 the situation that we have in front of us. And so, we
20 would have to make sure that it all made sense.

21 And lastly I would just say that regarding
22 the letter that was written in May of 2010, I share
23 some embarrassment with not having responded to that.

24 However, I will tell you that there is a draft
25 response letter that's been in the works for quite

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1 some time and it is actively being worked.

2 The issues that you raised in your letter
3 have extensive implications and it's been a difficult
4 letter to get staff consensus around a response for.

5 So, I know we've talked in previous public
6 meetings. Again, I appreciate your mentioning it and
7 I do offer that it should be - there should be a
8 response soon. And hopefully that will help inform
9 some of this discussion too.

10 MR. BRADLEY: My final thought. I think
11 the concern I have is partly that what 1.200 does is -
12 and when I say it's focused at CLB changes, that's all
13 been done historically on CDF and LERF. I mean, those
14 were the metrics that were chosen by the Commission,
15 endorsed through ACRS, that's what we've used.

16 So, it doesn't - it's not a one-to-one fit
17 with what you're trying to do here. It doesn't
18 directly - as Marty correctly pointed out, the backfit
19 guidelines don't line up with what 1.174 and 1.200 are
20 attempting to model. There's a disconnect.

21 And just to note that your expectations
22 that were outlined in Slide 12 relative to seismic-
23 induced fires, floods, spent fuel pool sequences, the
24 standard doesn't in its current form necessarily
25 address all those things.

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1 So, those would either have to be added or
2 addressed qualitatively or outside the scope of the
3 standard.

4 So, that's another disconnect from your
5 attributes and what's currently endorsed in Reg Guide
6 1.200.

7 MR. CHOKSHI: But we have just - the
8 seismic standard does talk about seismic-induced fires
9 and floods and qualitative. As you said, it's a
10 separate analysis.

11 MR. BRADLEY: Yes, it has a very limited
12 statement relative to induced fires and floods. And
13 then there's nothing in there, to my knowledge, on
14 spent fuel pool.

15 MR. CHOKSHI: But that was also looked at
16 in IPEEE process also, that same question. And I
17 think spent fuel pool --

18 MR. BRADLEY: Okay. Thanks.

19 MS. GLENN: Thank you. Next question.

20 MR. SMALL: Alex Small from Optimal Design
21 again.

22 And maybe following the same question that
23 was raised earlier by me, I have some comments of the
24 same subject of should be - on Slide 12, the first
25 bullet, "should be capable of addressing secondary

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1 effects."

2 How about emergency preparedness as a
3 result of a seismic event? Emergency preparedness of
4 people coming to the station. Roads are broken,
5 regions are destroyed.

6 And although the station did very well,
7 but the emergency preparedness organization is not
8 there maybe.

9 Another point is the mission time that is
10 used in the PRA for 24 hours. Well, in those seismic
11 events, we may go much longer. And just as an example
12 at the Fukushima station after two, three days, the
13 hydrogen explosion took place. So, we need to address
14 much more than 24 hours mission time.

15 And the last one is the fatigue rules. We
16 have specific situations of fatigue rules that are not
17 covered right now at all. And, again, back to the
18 same Fukushima event. People like the famous fifty
19 heroes needed to work continuously, because nobody
20 could replace them.

21 All those issues need to be addressed, in
22 my opinion.

23 MR. HILAND: Yes, thank you for the
24 comments.

25 MS. GLENN: All right. Are there any other

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1 questions from folks in the room?

2 MR. ABRAHAMSON: Hi. This is Norm
3 Abrahamson from PG&E again.

4 I have one question on just thinking a
5 long-term process like new information is going to
6 come again and again and how do you deal with it?

7 If you've gone through this evaluation and
8 you're comparing to your new spectrum with the SSE,
9 and then you find as you go through this either
10 through back - you exceed. And so, you're now going
11 to do your PRA.

12 And either through backfit analysis, it's
13 not economic or you identify one or two things that,
14 yes, it's worth fixing and you do that.

15 Now, my next evaluation, what do I compare
16 to? Is it still to the old SSE and I do that whole
17 process again, or am I now changing my spectrum up to
18 this higher level even though I've only backfitted or
19 corrected for one or two things that control the
20 hazard? How do you move this process forward in time?

21 Because we're looking at continually
22 updating our hazard, and we need to have a process
23 that we don't start over again every time.

24 MR. MANOLY: I guess the thought behind the
25 generic communication is not necessarily to request

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1 CLB change.

2 MR. CHOKSHI: Norm, I think the thought is
3 that if you have sufficient level of detail in the
4 information, then you can gauge what the new
5 information does to, you know. And you can make a
6 quick assessment of that this requires some minor
7 things, okay.

8 And if you had enough information, then I
9 think you can - it may not require as suitable the
10 full scope PRA and just certain -- I just meant get
11 you very quickly there. That's the thought.

12 And because when we are doing screening
13 analysis, that's one of the things we constantly
14 suffered, okay? We couldn't see how the new ground
15 motion will affect fragilities.

16 If you knew, for example, what are the
17 critical sequences, would that still be safe? So, I
18 think it's, to me, it's a level of detailed question
19 how much you know which will facilitate your how do
20 you deal with the new information. And having
21 detailed models and information facilitates that.

22 Now, in terms of a process, we haven't
23 done that thinking.

24 MR. ABRAHAMSON: So, as I started my first
25 comment with, I think GI-199 ought to set a broad

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1 approach on how to deal with new seismic information,
2 okay. And then you can do your specific applications
3 for the eastern plants.

4 But we are looking at essentially every
5 year re-evaluating our plant. And what do we compare
6 to? And as soon as we do make a change, can we now
7 screen at a higher level, or do we keep screening at
8 the low level and re-running things every time?

9 I think that's part of our difficulty is -

10 MR. CHOKSHI: I think that's a good
11 comment. I think we need to do some thinking. I
12 think it's kind of focused most on Diablo; is that
13 correct?

14 MR. HARDY: It is, but it happens
15 everywhere, too. This is not unique to west coast,
16 even. So, I think it's a good comment and is
17 worthwhile.

18 And this process of a quick assessment I'm
19 going to come back to, not always that trivial to make
20 that quick assessment. So, I think some thinking
21 would be in order.

22 MR. CHOKSHI: Maybe I should have said it
23 easier.

24 MR. HARDY: Easier.

25 MR. STONE: I'm Jeff Stone from

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1 Constellation Energy. Also, Chairman of the Risk
2 Management Subcommittee.

3 I wanted to go back to Biff's comment on
4 the letter on time frame to meet Reg Guide 1.200. I
5 just wanted to ask the NRC when do they expect these -
6 I mean, I think these are good goals to have, but when
7 would they expect to meet these for us to have seismic
8 PRAs and meet Reg Guide 1.200. And does that meet
9 your time frame for GI-199?

10 MR. CHOKSHI: I think we're going to talk
11 about that. We know that's one of the challenges out
12 there, okay. What time frame we can set and what we
13 need from our perspective, what, you know, the
14 industry can do, cannot do, and that's one of the
15 things we want to discuss jointly, you know.

16 There are implementation challenges.

17 MR. STONE: Thank you.

18 MS. GLENN: Thank you. I'd like to open
19 the bridge line since we only have eight minutes until
20 we break for lunch.

21 So, if we can open the bridge line and
22 survey for questions from our remote participants?

23 MS. DROUIN: This is Mary Drouin.

24 MS. GLENN: Hi, Mary. Go ahead.

25 MS. DROUIN: Just - I just want to add a

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1 clarification on 1.200.

2 If you go back, you know, over a decade,
3 the Commission directed us to work with industry in
4 developing a standard and for us to endorse it to
5 support the PRA policy statement. That was our
6 initial direction and that position, you know, has
7 never changed.

8 Now, certainly Reg Guide 1.174 has been
9 the most often place where 1.200 has been used. But
10 if you read 1.200, it makes it very clear that 1.200
11 supports more than just Reg Guide 1.174.

12 So, I just wanted to make that
13 clarification. That was all.

14 MS. GLENN: All right. Thank you.

15 Any other questions or comments from the
16 bridge?

17 (No response.)

18 MS. GLENN: Any seconds from the people in
19 the room?

20 (No response.)

21 MS. GLENN: All right. Then we will
22 adjourn until 1:00 p.m. We'll resume at 1:00 p.m.
23 sharp. Thank you all very much.

24 (Whereupon, the above-entitled matter went
25 off the record at 11:54 a.m. and went back on the

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1 record at 1:00 p.m.)

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A-F-T-E-R-N-O-O-N S-E-S-S-I-O-N

1:00 p.m.

MS. GLENN: Good afternoon, everyone.

MR. HILAND: Good afternoon.

MS. GLENN: Thanks, Pat. Welcome back to the afternoon session. Before we get started, I have a couple notes of housekeeping once again.

For the benefit of the folks using the bridge line, we did get some feedback that there was some ambient noise coming in from folks who had not muted their audio controls.

In order to do so, you can hit *6. Then if you wish to broadcast, you can hit *6 again to become audible, but it was disruptive to some of the people here using the bridge. So, we would appreciate it if you would use the muting to minimize the disruption.

Looks like we have some new faces. If you have not already, please be sure to sign the sign-in sheets.

And for those joining remotely if you would like to be acknowledge as a participant, please email Jonathan Rowley, R-O-W-L-E-Y. That's jonathan.rowley@nrc.gov.

Now, having said that, I'm going to turn

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1 the mic over to Pat Hiland who will give us a brief
2 overview of this morning's session.

3 MR. HILAND: Thank you, Nichole.

4 First of all I'd like to say my thanks to
5 everybody for the - I think we had a successful dialog
6 this morning. It's exactly what I had hoped is that
7 we would generate a lot of discussion.

8 Just from a personal perspective, I wasn't
9 quite focused on fixing Reg Guide 1.200 in this
10 effort, and I still am not focused on that, but I
11 appreciate the comments and the feedback.

12 I think you heard from our own staff that
13 we have some reservations with that and have
14 identified some discontinuities.

15 But with that, you know, my focus is
16 still, you know, we learned several years ago from the
17 USGS survey that the hazards had not been as what we
18 had expected over the past twenty years. And we took
19 a serious look at that.

20 We spent over a year doing that analysis.
21 and the analysis demonstrated that we were within our
22 regulatory framework of risk, and that we would pursue
23 a continuing effort to see if we can't have an item
24 that we would recommend improving.

25 So with that, I'd like to bring us at

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1 least for this afternoon the same type of format. We
2 have a couple slides. We'll open the dialog and the
3 discussion, but we would certainly appreciate the
4 feedback.

5 And we're really looking for what industry
6 - what they feel is correct way. And I know we've
7 talked about schedule. We'll leave that to the very
8 end.

9 The schedule of course, as I said earlier,
10 I'd like to do this in a month or two. And I
11 recognize that that's not going to be able, but I
12 would like to handle the Generic Issue somewhat
13 independent of some of the other problems that we've
14 identified, if I can do that.

15 I don't know that I have the answer today,
16 but I'm simple-minded enough to believe that I can
17 make some forward movement.

18 With that, let's go right ahead into the
19 available methods. And, Nilesh, your slides.

20 MR. CHOKSHI: Okay. I think we discussed
21 attributes this morning, and I think we actually have
22 talked quite a bit about methods, but I think I can
23 sort of regroup ourselves and get all of the remaining
24 discussions on the methods.

25 I just listed here the - most of this

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1 should be obvious. Available methods, seismic PRA. I
2 listed enhanced seismic margin because ASME/ANS
3 standard has a nonmandatory Appendix 10 B which does
4 talk about this. And so I thought just to be - at
5 least to mention that it is discussed in the standard.

6 As we know the SMM methods, there have
7 been two versions out; EPRI Success Path and NRC
8 Margin Method.

9 And the Success Path I think is sort of
10 self-explanatory. It's a success path we're shooting
11 down and -- while the NRC Margin Method is a somewhat
12 abbreviated fault space PRA type of approach.

13 But they share a lot of common insights
14 like they only deal with transients and small LOCAs
15 and make some assumptions. So, those are the two
16 margin methods.

17 And then I guess the question is that, you
18 know, the things we discussed, can we, you know, are
19 there other things we can tweak something to maybe,
20 you know, at least a number of attributes can be
21 satisfied and gets to the information we need in the
22 context of GI-199 and, you know.

23 And it also I think it's an important
24 questions that what I had - thought I had behind the
25 phrase combination of methods is that - because we

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1 going to talk about scheduling things. How there is
2 ways of sequencing information such that we can make
3 progress and get important information early enough in
4 the process. I think that probably we need to - we'll
5 talk a lot more about it.

6 So, I think that's all I think I need to
7 say about available methods. And we talked about
8 number of issues surrounding that, you know, deciding
9 which method to use and under what circumstances. Of
10 course that's another big question.

11 But at this point in time, let me go to
12 the next slides because I think that's related to the
13 methods, and I list the limitations of margin methods.

14 Because if you look at a lot of attribute,
15 obviously PRA has a great deal of potential to meet
16 all of the Level 2, Level 3 question being aside for
17 now, but in terms of core damage, understanding
18 accident progression.

19 So, I want to talk about margin methods in
20 terms of, you know, at least the way we see it. I
21 think the first, I think, is the - there has been a
22 lot of - that's one of the reasons why I brought up
23 the enhanced. That people have proposed -- to do CDFs
24 using the margin information.

25 At least I think our experience at best is

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1 mixed. You can do lot of simplification. You can
2 even come up with the bonding estimates, but then you
3 make a very simplified assumption.

4 And at the end of the day, it's not really
5 clear how useful that information is. And sometimes
6 it might tend to - may be misused, you know, okay.

7 Other limitation, I think I talked about
8 EPRI and NRC methods, seismic margin method, is that
9 based on the insights about 1983-94 time frame, that
10 based on the PRAs available then, we are basically
11 seeing from the seismic-induced core damage are
12 primarily two initiators are important; transients and
13 small LOCA.

14 So, it's the completeness issue that it,
15 you know, does not include number of seismic-induced
16 initiators.

17 Third bullet, I think it's the treatment
18 of non-seismic failures and operator actions. In the
19 success path, it is primarily - it's used - there's
20 the screening guidelines that operator action
21 probabilities and reliability type of the numbers are
22 small enough that won't affect seismic success path.

23 But it really does not give you any
24 insight in terms to that how effective or how integral
25 part of a seismic response in the plant response

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1 there.

2 Extension to containment and spent fuel
3 pool you have to do a little bit differently. I think
4 Marty talked about, you know, how extending to the --
5 context of IPEEE experience, but it generally requires
6 I think the margin -- stops at the access path only
7 goes to shut down, okay.

8 And I think beyond that list, the things
9 we talk about we need for GI and it at least appears
10 to - success path is - simply is not going to get us
11 the information to be able to be helpful in the
12 further regulatory analysis.

13 Again, lot of this I put there to flow
14 discussion, you know, attempt to because we think that
15 if -- we need to address these issues how we are going
16 to handle some of these things and whatever approach
17 we decide to pursue.

18 So at this point, maybe it good to have
19 further discussion on the matters because the next two
20 are the more on the implementation challenges and
21 strategies for challenges. So, I think it would be
22 good to separate the discussion now.

23 MS. GLENN: All right. So, we'll get
24 comments from the table first.

25 MS. KEITHLINE: Okay. I have a question,

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1 Nilesch, about on Slide 14, the limitations of the
2 margin methods, the "estimates of CDFs are not
3 robust."

4 And is the - I'm trying to make sure that
5 we understand the link from - the link to needing
6 robust CDFs in order to resolve GI-199.

7 It sounded earlier today like that may be
8 because of a desire or a perceived need to go through
9 backfit analyses and to have a quantified value that
10 you can compare to make decisions.

11 Is that the primary reason for the
12 importance of having robust CDFs, or is there a
13 different reason?

14 MR. CHOKSHI: I think there are a couple of
15 reasons. The one that you mentioned.

16 The other thing is I think the - once you
17 put the number out, I think, you know, it take its
18 life. And then we have alluded and then you have to
19 deal with it that that is the plant estimate of core
20 damage frequency.

21 And I think it doesn't have to be, you
22 know, very rigorous, but it needs to be fairly robust
23 in the sense that, you know, if somebody looks at this
24 plant versus this plant, it has some meaning to it.

25 Because you can do CDFs from margin

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1 methods using very approximate methods, okay, and
2 making, you know, very basic assumptions and just go
3 with the hazard frequency or something like that.

4 But I think those numbers are, first of
5 all, I think for the regulatory analysis that just
6 will be -- and also I think that number itself, it
7 really does not characterize actual plant risk. It's
8 a number that's --

9 MS. KEITHLINE: Okay. And then what drives
10 the desire to be able to compare CDFs plant to plant?
11 What's the benefit of being able to make plant-to-
12 plant comparisons?

13 MR. CHOKSHI: Let me answer a little bit
14 differently. People will compare, okay? And they
15 will draw the conclusions.

16 And then in people's perception, the
17 number the risk will be with the numbers you put out.

18 And we are dealing with those questions all the time.

19 And I think we need to pay attention to what number
20 is being put out, you know.

21 I mean, you know, because you may not want
22 to compare, I may not want to compare, but I'll be ask
23 question why this plant is higher than this.

24 And if I - if the answer is because the
25 method they use is not satisfactory. Although, this

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1 value is not the, you know, it's bound. I don't know
2 what exact value is.

3 I think it needs to be -- we need to -
4 even if you use margin method, I think this question
5 needs attention that, you know, it's simply generating
6 a number.

7 I think, you know, it's -- in the end, I
8 think you will have to, you know, there is a penalty.

9 MS. KEITHLINE: Okay. So, it seems on the
10 one hand like there may be ways to work through
11 Generic Issue 199 and characterize margin that
12 wouldn't necessarily require CDF values for all
13 plants.

14 But if you felt that it was helpful or
15 desirable to use some CDFs, then even if you told
16 people that they were not generated in a way or with
17 the intent to be compared, it's going to be hard to
18 prevent people from doing that.

19 MR. CHOKSHI: I mean, that's the one
20 component. Other component is also we need for
21 regulatory analysis is the potential implements.

22 And unless - and that way you need a
23 robust analysis. If your CDF value is not robust
24 enough, then the improvements you already define may
25 not be the right improvements.

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1 MS. KEITHLINE: You can do backfit analyses
2 without CDFs, can't you?

3 MR. CHOKSHI: Marty, I'll let you answer.

4 MS. KEITHLINE: Is there a qualitative or a
5 non-CDF way to make those decisions?

6 MS. GLENN: Marty, would you introduce
7 yourself?

8 MR. STUTZKE: I suppose that would be
9 allowed, but I, you know, our guidance is driving us
10 to be as quantitative as possible.

11 MS. GLENN: Marty, would you introduce
12 yourself, please?

13 MR. STUTZKE: Yes, Marty Stutzke, Office of
14 Research.

15 MS. GLENN: We're getting some feedback
16 from the audio-only folks that they didn't know who
17 was talking. Sorry.

18 MR. MOORE: Don Moore from Southern.

19 Nileshe, one thought we had was that the
20 one using margins, our expectation is and what our
21 belief is that the estimation of the seismic core
22 damage frequency is typically conservative. And that
23 may not be - that's - at least that's my
24 understanding.

25 Secondly, what we were looking at is that

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1 using whatever methods that we have as long as we feel
2 - use it as a screening tool, not to determine as new
3 ground motion hazard, is it a - does it have a
4 significant reduction on the plant design margin? And
5 if we can show that it doesn't, that would be one way
6 of quickly responding to this issue.

7 But if I understand what we're saying
8 here, this is -- what you're suggesting is that we're
9 going to be doing - the response is going to be
10 basically not just responding to this, but it's going
11 to be a basis for the plant to do risk assessments in
12 the future.

13 And, I mean, I - so, it appears to me that
14 we're kind of - the methods that are being suggested
15 are being - I'm saying this may be more appropriate,
16 is a method that would be leading to a seismic PRA in
17 maybe a Level 1 or whatever.

18 But still these more deterministic
19 approaches, we felt, would be valuable as a screening
20 tool to assess any significant - any kind of potential
21 reduction in design margin.

22 MR. CHOKSHI: I think you had several talks
23 on that. Let me - we talked about grouping of plants,
24 okay. And that may be a component for a certain level
25 of screening or some things and needed to hear what

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1 are the talks you have, and then you can go back,
2 okay.

3 But when you have to do the - when you
4 need the risk information, I think that we think that
5 margins is not going to get that to take you to the
6 right level of information.

7 We feel like it is going forward for a
8 particular site or something, you know. And you come
9 to decision that this belongs now in a category which
10 requires -- and our thought is that margin - you have
11 to address these limitations.

12 I won't say that they're not going to do
13 it, but we have some way to overcome some of this, you
14 know, challenges or limitations.

15 MR. MARION: This is Alex Marion.

16 But from the standpoint of current
17 technology and capabilities, you have no choice but to
18 apply a best estimate method CDF using margin analysis
19 today, near-term applications.

20 And if you're saying that that's not
21 adequate, then I would say, okay, what is the
22 solution?

23 MR. CHOKSHI: I think you are going to the
24 things we want to discuss, you know. And that's why
25 when I had in my previous slide, combination of

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1 approaches, we might do things in stages. I don't
2 know.

3 This is - just to throw out ideas when we
4 get to the next, you know. How do we, you know, given
5 the time constraint and things, how do we accomplish
6 and we are seeking feedback because that's -- we
7 recognize that that's a struggle for all of us in
8 terms of resources and time.

9 And so, how do we base the - meet the, you
10 know, overcome those challenges.

11 MR. MOORE: This is Don Moore.

12 Nileshe, I guess one thing that we were
13 looking at as a possibility is using IPEEE data or
14 going back, updating that and using that as an initial
15 screen using the new seismic PSHA, and make some
16 assessment of effect on design margin.

17 But that information could be used later
18 as part of the seismic PRA, but it's - we cannot all
19 get a seismic PRA at the same time.

20 MR. CHOKSHI: I fully - we all recognize
21 that and that's one of the things we want to discuss
22 about, you know.

23 I think what you're suggesting, you know,
24 is an approach and then you can subsequently use into
25 the --

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1 MR. MANOLY: This is Kamal Manoly.

2 Don, can you just talk more in detail on
3 what you trying to - you talk about updating the
4 IPEEE, and then doing margin evaluation, and then
5 seismic PRA. You mentioned three different things,
6 but not what you're prescribing.

7 MR. MOORE: This is not necessarily an
8 industry position, but this is something that we have
9 discussed internally as a possibility.

10 You basically go back to what -- your
11 IPEEE approach. You update it. Either if you did a
12 seismic PRA or you did a seismic margin, you go back
13 and you look at the report.

14 You look at the equipment - like, I want
15 to talk about seismic margin right now. You look at
16 the equipment, safe shutdown equipment list. You
17 verify that that still applies.

18 If some of the equipment has been removed
19 or replaced, then if it's been replaced, then you will
20 go in and do a walk-down and do a full assessment and
21 you would then calculate a new HCLPF.

22 It would give a chance also to some plants
23 that may have done like a reduced scope, they may
24 decide to go in and just reassess our SMA at a higher
25 level so that we can report a higher HCLPF value.

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1 Some of the plants along the Gulf Coast
2 just did their evaluation at their SSE level. And we
3 all - our expectation is that those plants have
4 significant - their HCLPF is much higher than their
5 SSE. So, this would be an opportunity to do that.

6 So, the issue is that we would have an
7 IPEEE SMA that will be updated to our current plant
8 configuration and that we may recalculate, sharpen the
9 pencil and possibly raise the reported HCLPF that we
10 reported back twenty years ago.

11 And we would then evaluate that HCLPF
12 Review Level Earthquake to the ground motion, and that
13 would be one way - and here again that new ground
14 motion in the GMRS, and we would make some judgements
15 there.

16 If we're falling below it, then we - at
17 this point, we would not do anything else because
18 we've already shown that our plant is above the new
19 hazard ground motion.

20 If we have exceedances, then we would have
21 to justify those possibly looking at where the
22 frequency of exceedances are.

23 Then we would go through some sort of
24 evaluation and then we would calculate re-
25 simplistically a point estimate of the seismic core

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1 damage frequency possibly just using ten hertz as a
2 structural frequency to do that at.

3 And then we would compare that, calculate
4 at seismic core damage frequency value understanding
5 that is an approximate, but we feel conservative to
6 some sort of screening level, slight, you know -- ten
7 to the minus five or one times ten to the minus five
8 or whatever.

9 And if we show that it's less than that
10 and then we have -- we do not feel that we have shown
11 that we have plenty of design margin for the existing
12 hazard.

13 Pulling all that information together, for
14 example, we would have soil properties that we would
15 have to use to get the hazard - proper hazard at the
16 ground surface. We would have gone through, looked at
17 our equipment, and at least part of that equipment
18 list can be then incorporated later into a seismic PRA
19 if we at some point go there.

20 So, that's just one step. I mean, that's
21 one way of looking at it. But here again it's just,
22 you know, it would be a way of evaluating the plants
23 initially. And it might be a way of doing some
24 initial screening.

25 And it may be that when we find that we

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1 compare a review level HCLPF, a Review Level
2 Earthquake to the GMRS, that the exceedances are high
3 - you get high exceedances, especially in the low
4 frequency, then the plant will -- may choose well
5 let's just do a seismic PRA.

6 MR. HILAND: Don, this is Pat Hiland.

7 Just to show you I've been paying
8 attention the last couple years, the acronym HCLPF is
9 high confidence, low probability of failure, for
10 everybody in the audience. That's okay.

11 MR. CHOKSHI: Don, I think this is - I
12 think this is the purpose of this meeting. And I
13 think you would like to, you know, have this thing -
14 needs to be written up or put it in feedback, and we
15 can discuss how you going to get the feedback.

16 Because that way you can sit down, think
17 about it and then, you know. And also I think it's
18 very important to understand how we plan to use it.

19 The screening and things, there's a
20 different sense, you know, how you use it makes a big
21 difference what you need for what purpose.

22 So, I think it will be good to have. I
23 think this is good feedback, you know. Because we
24 have been thinking about similar things and that's why
25 - and that was the purpose of this meeting to look at

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1 all available options we can think of.

2 DR. MUNSON: Of course there are plants
3 that did not do an SMA. So, I mean, it wouldn't make
4 sense for them to go and do an SMA as a screening.

5 MR. MOORE: Cliff, I totally agree. Maybe
6 I didn't make myself clear. I said I'm just going to
7 talk about the SMA.

8 We also feel if you did a seismic PRA,
9 then you would go back and you would still look at
10 your plant configuration to make sure that it was -
11 has it changed since you did that work back in the
12 '90s?

13 And you would update your event trees,
14 fault trees, whatever, to make it consistent with your
15 plant configuration.

16 You would take the new hazards that were
17 developed or that would come out next year. And then
18 you would just go through and recalculate, go through
19 the same process and calculate what they did for the
20 IPEEE and provide you a seismic core damage frequency.

21 So, basically it's going back and taking
22 the data that we already have, making sure that it's
23 up to date, and then using it in a way with the new
24 ground motion GMRS or the new hazard curves if you
25 need a seismic PRA, and using that as a way to make an

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1 assessment. Is there potential that our design margin
2 has been reduced, you know?

3 And then once that is done, one can make a
4 decision, you know, about do I need to do more? And
5 it may be that they may decide that this is - once
6 they see the results, they know they feel like it's
7 conservative, then that may lead them to say let's do
8 a full seismic PRA.

9 MS. GLENN: All right. Do we have any
10 other questions or comments from the table?

11 MR. MARION: Yes, this is Alex Marion.

12 I think Don eloquently captured one of the
13 near-term options that we considered in our meeting
14 yesterday. And I agree that it needs to be written
15 down and articulated so that we can focus on it and
16 see if it's adequate.

17 It strikes us as one of the near-term
18 activities that we can undertake - that we should
19 undertake in terms of updating the analyses that were
20 done years ago and making sure that they represent the
21 existing plant configurations. That's a necessary
22 first step.

23 And then as you go through the evaluation,
24 it will take you in the direction you need to better
25 quantify the differences in margin.

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1 MR. CHOKSHI: I think that was good
2 discussion.

3 Just to give you sort of inkling why I
4 think we need to look at it written down, for example,
5 a lot of the plants where we had only SSE, they are
6 not required to look at soil liquefaction and type of
7 things.

8 So, when you go back from this context,
9 you know, we need to think about what you have include
10 in those evaluations and that sort of thing.

11 That's why I think important to see so we
12 understand how you plan to use it and make sure that,
13 you know, we have all the, you know, okay.

14 MR. MOORE: I'm Don Moore.

15 I agree with you. I think some of our
16 ideas would be, you know, some of the plants that were
17 identified as being on that list of 27 are in the Gulf
18 Coast. And I believe that they're there mainly
19 because they only reviewed their - their Review Level
20 Earthquake was their SSE.

21 And I think that our belief is that those
22 plants can go back and reevaluate their - update their
23 IPEEE SMA and raise the HCLPF value, and it would be
24 to their advantage to do that.

25 MR. MARION: This is Alex Marion again.

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1 On Slide 14, you indicate the EPRI success
2 path approach will not get us there. I think for the
3 benefit of those, including me, it would help if you
4 would explain what's the problem or difficulty with
5 the EPRI success path that you don't think can be used
6 in this process.

7 MR. CHOKSHI: It's a success path, you
8 know. I'm sorry. For example, the operator actions
9 and the non-seismic failures are in - it's only used
10 in a screening manner, okay. It's not a part of the
11 analysis.

12 So, if you wanted to do even for those two
13 initiators, understand how operator actions play and
14 roll into the sequences or the non-seismic failures,
15 you know, to have a full understanding of that you
16 have to modify - take that success path and convert
17 into fault space, basically.

18 And if you look at the standard, it talks
19 about you can use success path to get estimates of
20 CDF, you know. And then as I said, not robust enough.

21 But when they talk about getting these
22 other insights, they say basically you can mold those
23 models into the fault space.

24 The standard list about six elements, what
25 risk assessment should address and what margins can

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1 address. And they talk about one and how you get,
2 okay, but it does not get you in terms of
3 understanding the rules of, you know, other things.

4 It focuses on the seismic capacity.

5 MR. MOORE: Don Moore again.

6 Just is there some advantage, then, to
7 looking at doing I guess a sequence level type
8 evaluation SMA similar to what is being required for
9 standard plants?

10 MR. CHOKSHI: That's a good question. I
11 purposely did not list PRA-based margin method for one
12 reason.

13 If you do the PRA fault or event tree for
14 standard plant, okay? It's supposed to be the
15 complete PRA systems model. And now you have a
16 hazard. Already you are required to do the hazard.
17 So, it just doesn't make sense not to do the core
18 damage, not to -- if you have the full system model
19 with fault trees, event trees, now, the only
20 simplicity you might gain is that instead of
21 fragility, you might do the HCLPF type of calculations
22 and that.

23 But it seems to me that if you had a full,
24 you know, that's one of the reasons I thought about
25 putting that on as a PRA-based margin, and I thought

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1 it really didn't make a whole lot of sense because you
2 had a hazard available to you. If you have full PRA
3 sequence model, the only saving would be to instead of
4 fragility, you might choose to do HCLPF.

5 MR. HARDY: Yes, I agree the classic NRC
6 margin approach in today's world - this is Greg Hardy.

7 Sorry. It was generated back when the Livermore and
8 EPRI hazards were different and it avoided that whole
9 issue.

10 So, today's world if we're going to have a
11 hazard everybody agrees to, to stop one step short it
12 probably doesn't make sense.

13 On the other hand, you could take this
14 success path, turn it into a plant logic model, but
15 the advantage is it's a very simplified one which
16 would allow you to take these operator actions, et
17 cetera, into account.

18 I think what we're talking about is a much
19 more simplified approach to try to get to where we
20 need to get. And I think we could do some things to
21 address exactly what you're talking about.

22 I think if there is some unconservatism in
23 the success path - generally speaking, it's
24 conservative. You're leaving out systems.

25 If there is some unconservatisms, we could

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1 talk about it and address it. And I think we can also
2 relatively easily put it into a plant logic format
3 such that you can calculate it.

4 You can do the conversion to a fragility.

5 You can do a conversion to get an SCDF. And,
6 presumably, you could even incorporate some LERF-type
7 applications into that model.

8 So, I mean, I think what we're looking for
9 is a use what we have and try to do a minimum
10 conversion to be able to understand a level that makes
11 sense, whether we got a risk or not, an increase.

12 MR. CHOKSHI: Well, you know, that's one of
13 the reasons why I did not list it as a margin method.

14 MR. HARDY: Yes.

15 MR. CHOKSHI: That it will not get us
16 there, because that's in the fault space. And as you
17 said, it's simplified, you know.

18 I think still there are, you know, as I
19 mentioned that if he, you know, propose your thoughts
20 and, you know, explain how you -- that will be good,
21 you know, how you see this would - what information we
22 need and how I think you generally took it.

23 DR. MUNSON: What we'll all have to decide
24 though is what Don's - what your proposal or what Greg
25 is saying. Is that appropriate for all cases?

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1 If we have sites or plants where the GMRS
2 has, you know, very high exceedances compared to the
3 SSE, you know, would a margins approach or dusting off
4 what we did for the IPEEE be appropriate?

5 MR. MOORE: It - the - I think what would
6 happen is that we have looked at taking this data.
7 And if you have exceedances, you would have to do -
8 you would have to do something to satisfy or provide
9 an assessment when you have significant exceedances.

10 And I think what we want to do is be able
11 to get there and make that assessment. And we need to
12 have tools to do that. And we need to know -
13 fundamentally we need to make sure for soil sites, we
14 know what the soil property - adequate soil properties
15 are to get the site response.

16 Then we also need to know the plant
17 configuration. And then we need to make sure if we
18 need - can we change the HCLPF value, raise it or if
19 we can find that we can do additional analysis.

20 Once we have that, then we can compare to
21 the GMRS. And once that - when that comparison is
22 made, we could make - then make the opinion or
23 judgment about where to go.

24 And that doesn't mean that it may lead -
25 that the best way to answer the issue of margin is to

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1 do a seismic PRA.

2 Or if there's just slight exceedances,
3 there may be other ways of showing that by looking at
4 where the exceedances are to make an assessment and
5 recalculate an approximate seismic core damage
6 frequency.

7 And we would also basically use that as to
8 check against some sort of baseline so that we can say
9 do we need to do something more than what we had? Do
10 we need to do additional analyses? And that could
11 easily lead into a higher level assessment.

12 I'm not sure if I answered your question,
13 Cliff, but -

14 MS. GLENN: For the folks on the bridge,
15 the question was posed by Cliff Munson of NRC, and
16 responded to by Don Moore of Southern Nuclear.

17 DR. MUNSON: I think you'll see when Pat
18 gets to the schedule that our first thought was that
19 people do the hazard first.

20 So, I think, you know, at that point in
21 time then we would need to make decisions about which
22 method would be appropriate depending on what the
23 hazard looks like.

24 MS. GLENN: Very good. Any other questions
25 or comments from the table?

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1 (No response.)

2 MS. GLENN: Okay. We'll open it up to the
3 well.

4 MR. KASSAWARA: Bob Kassawara.

5 Nileshe, I wondered if you could explain
6 why you think that extension to containment and spent
7 fuel pool is not possible.

8 Wouldn't it just be a matter of
9 considering a, quote, success path for each one of
10 those and adding some components to look at?

11 MR. CHOKSHI: I will think about that, but
12 I think success path for containment will be difficult
13 to define in a - because you have to probably
14 understand the vulnerability of containment systems,
15 penetrations and, you know, the other things, the way
16 the containment failed, structural failure.

17 So, I mean, up to now nobody has extended
18 margin type of analysis to look at containment, okay.

19 Spent fuel pool the same. We haven't done that,
20 okay.

21 I mean, you could create a sequence model.

22 We have done spent fuel pool risk analysis -- and I
23 haven't thought about, you know, if you have a model
24 in a fault space, I guess you can convert into the
25 success space, but nobody has done it so far.

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1 I'll leave it at that.

2 MR. KASSAWARA: Bob Kassawara.

3 I agree nobody's done that because, well,
4 there hasn't been a need or whatever. But I think
5 philosophically or methodologically there's no reason
6 why you can't find a success path for any set of
7 systems. It's a matter of how many components you're
8 going to have to look at and how complex it is.

9 But if I want to maintain a spent fuel
10 pool cooling, there's a system to do that or there may
11 be several ways to do that. And if I select one of
12 those, I can determinate a HCLPF for that system.

13 MR. CHOKSHI: It is my personal view that
14 if you are seeking information related to the risk or,
15 you know, then thinking in terms of fault trees and
16 event trees lot more meaningful and gives you that
17 insight.

18 If you use success path, you still that if
19 you have to answer that question, you are to do some
20 other approximations. For me if you're starting with
21 -- fault space type of model.

22 MS. GLENN: Thank you. Any other questions
23 from the well?

24 MR. WHORTON: Bob Whorton with South
25 Carolina Electric and Gas again.

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1 Regardless of how we calculate seismic
2 risk or core damage frequency, I think we need to not
3 lose sight of what we learn from the IPEEE.

4 From an industry perspective, we believe
5 that the walk-downs that were performed in the plants
6 for the seismic margin assessment went a long ways in
7 improving or enhancing seismic safety.

8 Many things were done. Anchorages that
9 were missing or maybe incorrectly installed were fixed
10 or replaced. Seismic interaction issues were taken
11 care of, the two over one-type issues from non-safety
12 over safety.

13 We did things that we call seismic
14 housekeeping. We mounted ladders that were
15 freestanding in relay rooms, to the walls with very
16 rigid brackets.

17 We chained rolling carts to the structural
18 members to keep them from rolling under earthquake
19 conditions.

20 So, you know, as Don Moore was presenting,
21 we believe strongly in the - like a margins type
22 approach that it does enhance seismic safety.

23 So, you know, whereas seismic risk, a
24 value may not really enhance safety as much as a real
25 application. So, I didn't want to lose sight of what

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1 we had done in IPEEE.

2 MR. CHOKSHI: I fully agree with the walk-
3 down is one of the most important and give us lot of
4 insight.

5 MS. GLENN: Next question?

6 MR. RICHARDS: This is John Richards with
7 Duke Energy. I'd just like to echo a little bit.

8 What you're hearing I think from industry
9 side, is the idea that we have these existing
10 assessments done under IPEEE. And that if the goal is
11 to validate the seismic safety in light of new seismic
12 hazards, then we have these other tools that we could
13 update perhaps in a more rigorous fashion than the
14 first time, and achieve that in a more timely fashion.

15 And what I think you're hearing on our
16 side is a little concern about the effort it would
17 take to implement seismic PRAs for a broad number of
18 plants in a very timely fashion.

19 So, we're looking for some opportunities
20 that would allow a more timely and adequate response
21 to demonstrate seismic safety.

22 We understand in your regulatory process,
23 you're in the middle of a risk-informed process. So
24 therefore, you know, there's some need for risk-
25 informed parameters.

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1 So, we're attempting to migrate on a path
2 that accomplishes both goals in as timely a fashion as
3 possible.

4 MS. GLENN: All right. More comments from
5 the well?

6 MR. MOORE: Hi, Don Moore.

7 I kind of want to go back to what Jon was
8 saying and one reason we were talking about the IPEEE.

9 In one of your slides, you -- as a
10 screening tool and the first thing you said you would
11 like to do, and I understand that, is that you would
12 calculate using the new hazard and soil - and
13 characterization of the soil profile and come up with
14 site hazards, which you could then use to calculate a
15 GMRS. And then in the slide, you said compare it to
16 the SSE.

17 One of the things that we feel is that if
18 we have an evaluation that shows that our plant has a
19 HCLPF value much higher than the SSE in what I would
20 like to call as a HCLPF Review Level Earthquake, that
21 is what we would like to use as a comparison. But to
22 be fair in using that, we have to make sure that it
23 still applies.

24 So, we have to go back and look at our
25 safe shutdown list, make sure that it hasn't changed.

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1 If they - like I said, if they've taken out some
2 piece of equipment and put something else in, to make
3 sure that that HCLPF that we reported, we would go
4 down and have to do a walk-down of that new piece of
5 equipment.

6 Then when we go through this whole
7 process, then we will have a verified HCLPF Review
8 Level Earthquake that is current, and then we can do
9 the comparison.

10 DR. MUNSON: No, I definitely think there
11 is some merit to that approach doing a multiple
12 comparison perhaps with SSE and RLE keeping in mind
13 though that, like I said earlier, a lot of the plants
14 did not do margins.

15 So, there are some details that need to be
16 explored - that was Cliff Munson.

17 MS. GLENN: All right. I'd like to offer
18 an opportunity for the other folks in the room to ask
19 questions or pose comments.

20 (No response.)

21 MS. GLENN: Okay. In the absence of
22 questions from the room, let's open up the bridge line
23 and take questions and comments from those folks.

24 MR. MCGUIRE: Yes, this is Robin McGuire
25 from Fugro William Lettis, and let me build on the

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1 comment that Don Moore and Bob Whorton made regarding
2 seismic margins and direct this to Niles.

3 I would characterize or put the
4 perspective on that as much as Jon Ake represented
5 hazard as a screening tool by comparing GMRS and SSE,
6 I think what Don Moore and Bob Whorton are suggesting
7 is that margins are useful as a second screening tool
8 to identify those sites or plants that need a harder
9 look.

10 And do you see anything fundamental that
11 would make that not valid, is my question.

12 MR. CHOKSHI: And simple answer is no,
13 okay.

14 I think that approach is, you know, that's
15 what we want to hear, understand that approach in
16 detail that how will you use as a screening tool? How
17 will you use it when you determine that you have to go
18 to the next step? What methods do you use? So, we
19 could have a complete picture, Robin, you know.

20 I think given the consideration of time
21 and determining in a quick way what needs to be done,
22 I think we have to use all available tools to us. And
23 I think this is - but I think we need to understand
24 the details, you know, how that proposing as a
25 screening tool and what will be the tool for the

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1 plants which goes into the next level.

2 MR. MCGUIRE: Sure. I agree. The devil is
3 always in the details. But I think on that point, I
4 guess we have agreement. Thank you.

5 MS. GLENN: All right. Thank you. Next
6 question from the bridge.

7 MS. DROUIN: This is Mary Drouin.

8 I just want to make an observation that
9 going back to using the IPEEE - now, I'm not making a
10 comment on whether the, you know, it's adequate to use
11 a seismic margin method here or not. I am strictly -
12 want people to recognize that when we reviewed the
13 IPEEEs, and I'm looking at this more from a technical
14 quality, technical acceptability perspective, our
15 review was very cursory.

16 And in fact if you go and look at every
17 report that was sent to each licensee as a result of
18 their IPEEE, every report has a disclaimer in there
19 that the NRC review was only - could only be used to
20 support, you know, Generic Letter 8820. And our
21 review would have no bearing on other uses of whatever
22 method, you know, you chose to use for your IPEEE.

23 I think somehow that needs to be factored
24 in here the issue of technical quality acceptability
25 of these IPEEEs.

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1 MS. KEITHLINE: Real quick just to follow
2 up, this is Kimberly Keithline from NEI, I think
3 that's a good point that Mary made. And in fact that
4 those reviews were done for a specific purpose to
5 respond to Generic Letter 8820, which to me anyway as
6 I study what was done for the IPEEE and look at what
7 we're talking about doing today, in many ways the
8 basic concept looks very similar to me.

9 I'm not a seismologist, but the hazards --
10 we're exploring the effect of the seismic hazard
11 information.

12 And so to a very simple-minded person, it
13 seems like an approach that was used to address that
14 specific purpose, that a similar approach might be
15 appropriate for a question that in many ways looks
16 very similar to the 8820, the IPEEE question back
17 then.

18 So, I think it's worth considering and
19 we'll have to talk about whether and how to give you
20 something that you can more thoroughly consider.

21 MR. MANOLY This is Kamal Manoly.

22 I think our first thought was to - I
23 checked with the lawyers whether we can ask for a
24 supplement section to GL-8820 and to update everything
25 that was done, but they said it's too far back. That

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1 we need to have a new communication.

2 But I think the thought process is still
3 to get a product that's more up to date, reflect the
4 plant conditions. And the methodology, we may argue
5 about the methodology, but the idea is to reflect what
6 the plant condition looks like.

7 MR. CHOKSHI: I think Mary's point is well
8 taken. And I think this is probably I'm repeating,
9 but going back to, you know, we - if you look at the
10 GI process that Marty described, ultimate decision
11 criteria is risk - risk-informed criteria, okay.

12 So, I think in our thinking - and that's
13 why I like to see the details. In the screening
14 process, it should be consistent with the criteria of
15 which decides where you go, okay.

16 So, that - so in terms of from the
17 perspective for IPEEE, which was to identify
18 vulnerabilities, if you plan to use this in a more in
19 a risk context, I like to know the details about what
20 upgrades you are thinking once you're going back and
21 look at it, how will you update the resource so we
22 understand that whatever screening criteria you use is
23 consistent with all the population of plant, okay.

24 Why we came to say this plant can stop
25 here, this plant can go forward, and what it will be

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1 ultimately, you know, re-evaluated on.

2 So, that's the thing that we need to have
3 that consistency of approach to the entire chain,
4 okay. That's why I think it's important to
5 understand, you know, that are you looking from the
6 risk perspective to update your information, and can
7 be done. And so, that's sort of - it's a detailed
8 question, you know.

9 MR. MARION: Yes, this is Alex Marion.

10 I don't disagree with what you're saying,
11 but you have to maintain a balance. In the final
12 analysis, you look at the risk insights. And then you
13 look at the more deterministic aspects that are not
14 modeled. And then make an informed decision of
15 whether it's adequate, sufficient.

16 MS. GLENN: All right. Is there another
17 call on the bridge, another question?

18 (No response.)

19 MS. GLENN: All right. Shall we proceed
20 with Slide 14?

21 MR. MARION: Alex Marion. Real quick, is
22 there an action item coming out of this discussion?

23 I made a note of trying to capture what we
24 talked about in terms of our proposal in the near term
25 and will take that under consideration writing

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1 something down.

2 But I'm thinking -

3 MR. HILAND: As far as the process, I
4 think, that - this is Pat Hiland - that Don Moore
5 described you walk through -

6 MR. MARION: Right.

7 MR. HILAND: -- I like that discussion,
8 but I agree I'd like to see what you suggest, to send
9 us a communique on it or a letter?

10 MR. MARION: Or we could - I'm assuming -
11 this is Alex Marion again.

12 I'm assuming you're going to put a draft
13 Generic Letter out for public comments.

14 MR. HILAND: Yes.

15 MR. MARION: And one of the things we could
16 do is submit that as part of the comment period, or if
17 it's acceptable to you, we could submit it earlier.
18 But I'll leave that to you to give us some feedback.

19 MR. HILAND: Yes, I'll talk with Kimberly,
20 but I think the sooner the better. I mean, if you can
21 - I know it takes some time and some work and some
22 thought, but the whole purpose of our workshop is to
23 solicit ideas. And that's what we're doing.

24 And I think Don's idea, you know, we've
25 got it transcribed, but I know we only gave you a

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1 couple days to look at our slides and a couple minutes
2 to have that discussion.

3 If you'd like to submit to us, you know, I
4 wouldn't expect it tomorrow, but I wouldn't expect it
5 in July either, you know.

6 So, if you can put something down on paper
7 that we could use in our thought process as we're
8 developing our generic communications, I would
9 certainly appreciate it and it would help us in the
10 long run.

11 And I'll go back and this - I'm not a
12 seismologist either. I think we've gathered that
13 through the meeting, but I really like the idea of the
14 IPEEE look back, in other words, for the facilities to
15 go back and look.

16 And even Mary Drouin when she spoke, she,
17 you know, she implied that, you know, our look was a
18 very surface look at the IPEEE submittals.

19 And as my staff explained, there were a
20 number of commitments maybe that were internal
21 commitments to the licensee. Hey, we found this tank,
22 it needs an anchor bolt, we're going to put an anchor
23 bolt in.

24 I don't have any documentation twenty
25 years old that say, yes, we confirmed the anchor bolt

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1 was in.

2 So, one of the first things I would
3 suggest to the staff in writing the communique, is
4 that they ask the licensees to go back and confirm,
5 you know, what they have and that it's in fact the way
6 it exists today.

7 I like, you know, you phrase it maybe they
8 changed something over the past twenty years and what
9 they relied on as a success path is different today.

10 MR. MOORE: This is Don Moore.

11 I totally agree with what - Pat, what
12 you're saying. One of the ideas we had was when we
13 meant by update, in the reports they have a list of
14 open items. And to - and those open items are - need
15 - are tied to the HCLPF value we reported.

16 So, to be able to use the HCLPF Review
17 Level Earthquake, we would have to go and make sure
18 that those commitments have been met and they're being
19 maintained.

20 Some of them had to do with housekeeping,
21 as Bob said, and so - we agree? okay. Thank you.

22 MS. GLENN: All right. Slide 15, please.

23 MR. CHOKSHI: We talked about this a number
24 of times, but again I think there might be many other
25 challenges. But the three - and as we just discussed,

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1 we are developing basis for plant evaluation methods.

2 And I think going back to, I think, you know, for the
3 screening purpose, for the evaluation purpose, we need
4 to get your thoughts and we need to - we'll probably
5 wind up with more discussion on that issue, you know,
6 how we discuss it and once we get feedback from you.

7 Availability of expert resources, I think
8 that's - we know that in US I think after IPEEE, there
9 has been considerable slowdown in doing this type of
10 activity and we don't have that many resources out
11 there.

12 And that's where I think when we talk
13 about in the next slide, we probably need to think
14 about it, how do we mobilize the resources or how we
15 create resources. And what is it that, you know, we
16 can implement approaches at least to minimize some
17 impact on the schedule, as well as - and then the time
18 to complete analysis I think we talked about.

19 And we like something back from you, what
20 you think, you know, certain type of analysis or the
21 time it will take.

22 Of course this is going to be - first the
23 information we need is the most significant factor
24 that we need to have right information and the right
25 quality.

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1 And then I think the time is critical
2 factor that, you know, how soon we can do this thing
3 and move forward with that.

4 And I think Pat will talk about or touch
5 on that, but I think - but in terms of implementation,
6 and I think that's where, Don, when you talked about
7 screenings, you know, and that it's appealing because
8 it gets you certain insight sooner, you know. And
9 that may help our decision-making process moving and
10 expedite moving forward. So, I think -- so, that's
11 why we like to hear those ideas.

12 So, what are the other challenges? We
13 listed the three, you know, which is obvious and
14 standing - and stood out, but anything else we needed
15 to think about?

16 MR. MARION: Yes, this is Alex Marion.

17 There are two things I feel compelled to
18 mention. One was there was an internal activity
19 within the NRC looking at the cumulative effects of
20 NRC regulatory actions.

21 I understand that some - a second paper
22 has gone to the Commission and staff is waiting for a
23 Commission response on that.

24 Additionally, the executive level - I'm
25 sorry - the senior management level task force that

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1 was established to look at the short term and longer
2 term implications, lessons learned, if you will, from
3 Fukushima Daiichi is also in play.

4 And I think as we go forward in terms of
5 schedule, we need to keep in mind priorities, all
6 right?

7 I don't know what the answer is right now,
8 but I just put those two items out there for your
9 consideration because they will have an impact not
10 only on NRC, but industry as well.

11 MR. HILAND: Yes, this is Pat Hiland.

12 Thank you, Alex. We're well aware of both
13 of those activities that are ongoing, but we elected
14 to proceed with our planned efforts to try and move
15 this generic issue along. It may be impacted by both
16 of those.

17 MR. MANOLY: This is Kamal Manoly.

18 Maybe you guys have thought about this
19 before you came to the meeting or in the past, but if
20 - in terms of doing whether you're going to do seismic
21 PRA or seismic margin, do you have estimates of
22 resources that are going to be - I mean, just - I'm
23 sure it's being thought about.

24 MS. KEITHLINE: Well, we had quite a
25 discussion about that yesterday. And one of the

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1 challenges is with any of the options, there are all
2 kinds of variations.

3 And based on different assumptions of what
4 you might simplify or what additional work you might
5 do and how detailed you might get, the ranges end up
6 being pretty extreme.

7 But for - they're going to hit me if I'm
8 wrong, or they'll chime in, but the best I could kind
9 of get was if we were going with a new Reg Guide
10 1.200-type seismic PRA for all the plants, we felt
11 like that would probably be an effort that would take
12 on the order of a decade to complete, but this is
13 radcon math. This is plus or minus some amount of
14 time.

15 And I'm not sure how preparatory work
16 leading up to that before you could really get started
17 cranking them out -- with the fire PRA, there was time
18 needed to develop guidance, figure out how you're
19 going to go do it before you really got it started.

20 So, that review has been something that's
21 not really achievable for large numbers of plants in
22 the near term.

23 When we start to get into discussing an
24 IPEEE look-back type of an approach, it will become
25 dependant on some of the assumptions or

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1 simplifications that we decide can be made.

2 And I'm going to kind of look to Don and
3 the way you've described it here this afternoon, do
4 you think that's the type of thing that maybe plants
5 could do in the next two or so years, or is it longer,
6 or does it really depend?

7 MR. MOORE: Here again I totally appreciate
8 that some of the IPEEE assessments had different
9 levels of quality. And I think our expectation is
10 that those when we update, we should have some sort of
11 standard that we update to.

12 What worries me is the - we have to
13 realize that the IPEEE activity, we went through a lot
14 of engineers, structural, mechanical and electrical,
15 mainly structural civil engineers, went through weeks
16 of training. And some of us are still around. Some
17 are not.

18 And so, we would have to make - we would
19 have to from industry point of view, kind of I think
20 develop some standards or something that we can use as
21 a screening tool to make sure that the quality of the
22 updates are consistent.

23 And I would think that would take some
24 effort. And I would think we're talking years, but I
25 think, you know, but it is something that, you know,

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1 that some of the work can be done fairly quickly.

2 And I personally think that a lot of this
3 work can be - it's not just a onetime thing. Some of
4 this information can be later converted to a more
5 sophisticated analysis.

6 But mainly what I'm pointing out, there is
7 a limited number of resources. And some of the SMAs
8 are -- and seismic PRAs were done by consultants. And
9 some of those are still available, but the, you know,
10 you only can do one job, one evaluation at a time.

11 MR. MARION: Yes, this is Alex Marion.

12 If I may add to that, one of the things we
13 often do at NEI once we lay out a methodology or an
14 approach, which this is going to do, we can get some
15 input from utilities on what resources are necessary
16 to implement that.

17 And we'll probably provide that to you, I
18 would think, when we're in the public comment phase
19 with the Generic Letter because we have to get a
20 methodology down first.

21 And that will just be a snapshot from the
22 sampling of a handful of utilities, and we can provide
23 that to you at that time.

24 MR. WHORTON: This is Bob Whorton. South
25 Carolina Electric and Gas.

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1 Just to supplement what Don was saying, he
2 and I were both involved in IPEEE twenty plus years
3 ago and the effort from start to end was probably
4 three-and-a-half years, as best as I recall, but it
5 took a lot of training and qualification.

6 And the intent back then was that the
7 utilities would try to retain some level of ownership
8 in the program, not just have a contractor come in and
9 do it and disappear. So, that was one of the key
10 aspects is to get these staff trained. And, again,
11 most of that staff no longer exist at most of the
12 plants.

13 So, even to do an update to the IPEEE,
14 you're going to have to go back through all of those
15 same processes of training, updates to the success
16 paths and the actual plant walk-downs if needed and so
17 forth.

18 So, I don't see it as a very short time
19 frame. I'm thinking two to three years minimum.

20 MR. CHOKSHI: This is Nilesh Chokshi.

21 Bob, what you just mentioned, in fact,
22 have you guys - have you started thinking about how to
23 augment this process from reconsidering - I think it
24 was EPRI was conducting training classes when we were
25 doing IPEEE.

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1 Have you thought about implementing some
2 things to -

3 MR. WHORTON: This is Bob Whorton again.

4 At this point in time, we have not. We
5 have just been looking at general options. Don and I
6 have been speaking more to the seismic margin
7 assessment process. And there's another third of the
8 total plants probably have SPRAs.

9 So, you know, they're going to have to
10 develop an equal level of some activities, but we
11 really at this point in time have not thought forward
12 as to who can do the training and so forth.

13 MR. KASSAWARA: This is Bob Kassawara.

14 We have begun to train - we have a
15 training course for seismic PRA that we've given a
16 couple times, and we're still in the process of making
17 it better each time.

18 We did the training for SMA some years ago
19 and, you know, that could be dragged out again, but
20 the effort to do both of those in tandem would be
21 pretty intense.

22 MR. HILAND: So, let me give my initial
23 reaction. First of all, ten years I'll be retired.
24 So, you know, that's a long way out ten years from
25 now.

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1 Yes, I guess my - and I'll walk away and
2 talk to the staff and we'll think about what we've
3 heard. And we were expecting those types of numbers.

4 I guess my thoughts are, you know, a
5 generic communication can lay out; one, just to
6 respond, send us your schedule, you know. We'd like
7 to see your schedule for going back.

8 And I would expect the first step, you
9 know, this has not been a slow news item. People have
10 known about this report for a number of months, if not
11 years, in the working.

12 I would expect the ability to go back and
13 look at the IPEEE and verify the actions that you said
14 you were going to take, the industry said I was going
15 to take would be pretty simple. Simple being not in
16 terms of years to respond.

17 But then, you know, after that if you have
18 to go and update your SMA, it may have to have
19 required training and expertise.

20 Those plants that have seismic PRAs, of
21 course we heard on the west coast there's plants that
22 do this every year. And so, I would expect for that
23 particular plant, that they would not have the
24 challenge of implementing it. And I don't know what
25 the other facilities in the country have.

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1 I'm not thinking in terms of decades, I'm
2 not thinking in terms of five years, but I am thinking
3 maybe in stages.

4 I think Nilesh had mentioned that earlier
5 that maybe the right idea is to propose - and you'll
6 have an opportunity as I said at the very beginning
7 when we publish our first draft, it's out for public
8 comment.

9 And we - the resolution of those public
10 comments go through our Advisory Committee on Reactor
11 Safety. So, we'll have to defend any resolution of a
12 public comment that we get. And you're all familiar
13 with that.

14 That's just my reaction. That's all I can
15 give you is I'm thinking more - I would certainly see
16 stages that if you, you know, if I go back and I look
17 and the hazard has increased substantially, meaning
18 it's meaningful increase at my facility, I may have to
19 instead of I had done a seismic margin analysis twenty
20 years ago, I may want to do a PRA that may take me
21 some time because of the schedules and training, et
22 cetera.

23 That's probably okay, but the - yes, I
24 would expect that others - the vast majority should be
25 able to respond at least to the first or second stage

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1 not in terms of decades, anyway.

2 That's my reaction. Anyone else?

3 MR. MANOLY: This is Kamal Manoly.

4 If you develop the GMRS for the site and
5 you find that it envelops -- enveloped by the SSE, you
6 know, up to 25 hertz, that's fairly limited effort,
7 isn't it?

8 I mean, it shouldn't be more than six
9 months at the most. I'm just thinking, you know.

10 MR. MOORE: Kamal, if I understand, you're
11 saying if the GMRS based on a new hazard is enveloped
12 by the SSE?

13 MR. MANOLY: Yes.

14 MR. MOORE: Well, then that's a - I mean,
15 that would be something that could be done probably
16 next year. As soon as we get - as soon as we are able
17 to provide the right soil properties and get the right
18 hazard curves at the right elevations for that site,
19 then we can - I was thinking, you know, it's very
20 possible we could, you know, initially just take what
21 we have even though, I mean, the SSE is - we don't
22 have to check that. That is our design basis.

23 And if you've fallen below that, that's a
24 - I think that can screen us out from doing anything
25 additional.

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1 If we have a Review Level Earthquake and
2 we use that, I think - and we find that we're pretty
3 much enveloped by that, then, you know, we - I think
4 we still are obligated to go back.

5 Even though we can report that, we still
6 are obligated to go back and make sure that that
7 Review Level Earthquake evaluation is still valid.

8 And so, that will take some time, but we
9 can still do the comparison.

10 MR. CHOKSHI: In fact, we just backtalk
11 about submittal of information in stages. Cliff
12 started talking about prioritization of plants and --
13 because I think in order to - we'll have to come in
14 some order, because I don't think, as Pat said, it's
15 going to be satisfactory to anybody is going to take
16 ten years.

17 There will be sequencing of information.
18 There will be sequencing of certain, you know, plants
19 based on what we get from the hazard, okay.

20 And so I think the - some things are I
21 think we know we can do in time. There's no
22 discussion about which method, who should do it or not
23 like hazard, okay.

24 I think we haven't heard that - here that
25 some people don't need to do hazard. I think we

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1 should do it at least that every site will do the
2 hazard. And that's one of the first critical piece of
3 information.

4 So, I think we may use that. And I think
5 that two things, one is to the screening by GMRS.
6 Other thing is to put the plants - in which plants
7 need to be in the first stage coming up with the
8 information because perception of, you know, hazard.

9 And we need to think about criteria. And
10 we need suggestions. We've been talking about that
11 how do we do this, okay?

12 So, we can at least have some - because
13 there will be questions to us, okay. There is certain
14 - the questions from outside and things, what are you
15 doing with this, you know? This hazard has gone up,
16 okay.

17 So, we need to have some scheme, I think.
18 And the next level of information is, I think, again
19 we need to think through what confirmation of walk-
20 down, okay. Or as you go and have a more better
21 perception of what are the scheme you want to use
22 overall. For example, the margin insights are
23 critical to make next decision, and that can come
24 earlier than we need to be there.

25 So, I think put everything in terms of

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1 stages. It seems to, you know, that you just can't
2 wait until at the end of the ten year to go and look
3 at and then we'll know, okay.

4 Pat, tell me if I'm saying something not,
5 you know, but it just -- it just doesn't, I think,
6 work, okay.

7 Now, that's the -- in terms of things how
8 we orchestrate and schedule the information, but I
9 think it's also - I would not like to throw up our
10 hands and saying we have limitations of resources and
11 there's not available, you know, expertise and stuff
12 and not try to deal with it in some fashion.

13 A lot of that initiative has to come from
14 you. And you probably have lot better sense of what
15 can be done, what can be accomplished.

16 But, you know, we are just sort of
17 thinking about that work, you know, like team
18 approach, okay?

19 If you need to develop, for example,
20 fragility for a certain type of design, and I think as
21 you all know that lot of you can use generic type of
22 information, and then you have to do certain plant
23 specific, that might be a common way to establish
24 those that everybody doesn't have to do that and
25 minimize time, but that's your decision.

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1 But I think it will - I think it's
2 important that we also think in terms of how to
3 interject some efficiencies which help us schedule.

4 And I think - I would say that probably
5 ideas come from - we can't, you know, we can't impose
6 those kind of things, because we know that's not
7 appropriate or not doable anyway.

8 So, I think that was the discussion, you
9 know. I think it's collective thinking, you know. If
10 you want to do the business as you - it will take
11 time. That's true, but I think what are the other
12 ways.

13 And we have to think about, you know, and
14 again using your feedback about how do we prioritize
15 certain things, you know.

16 MR. HARDY: This is Greg Hardy. Just a few
17 thoughts on this.

18 This is a key consideration. We knew it
19 would come down at the end, and we'd talk about it.
20 But this project schedule considerations, there's a
21 lot that goes into that.

22 The common goal is we want to come up with
23 a quality product, and one that could be used in the
24 future. And of course optimizing schedule and
25 optimizing those two things don't always coalesce as

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1 easy as you think.

2 So, there are industry research projects
3 going on. EPRI has quite a few, IAE has some and the
4 NRC has some in these very areas that ideally if they
5 were available now, we would use.

6 There's treatments of high frequency that
7 we talked about earlier. There's gaps from our PRA
8 pilot that we would like to institute so that future
9 SPRA SMA applications wouldn't have the kind of
10 hurdles that we did.

11 There's new ways to do seismic risk
12 quantification. There's just a number of things that
13 are active, ongoing projects right now that we'd like
14 to use as part of this.

15 NRC is doing work, or plans to do it on
16 Level 3 CAV research, what's the best damage-
17 indicating parameter, Annie Kammerer's got the
18 correlation project that I'm part of.

19 All these things are tools that we'd like
20 to use, and everybody would like to use. So, there's
21 fitting those into the schedule.

22 Biff talked about the letter last year
23 that was a timeline that NEI sent out. I think one of
24 our actions/takeaway is to take that and try to update
25 it with what we now know, which are new issues,

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1 topics, research on the table and how that might
2 integrate into this decision.

3 So, IAE is doing some things. They're
4 going to be doing a new SPRA guide that some of us may
5 participate in that might have an application here or
6 use.

7 The hazard we talked about I promised we'd
8 come back to, the NGA east study is still - if we're
9 not talking about a short term and we are talking
10 about a long term, there may be a way to integrate
11 that into the system if it's - or we talked about an
12 updated, expedited version of that where the main
13 thrust of some of that would be useful in this
14 application, because I think it would affect some
15 plants. So, there are some things there to think
16 about in this timeline as we kind of go through it.

17 The standards, we talked about. There are
18 potential updates to it. I don't think they're
19 dramatic. But if we could coalesce there, it would be
20 nice to have a standard everybody agreed to that we
21 would be using this for.

22 The pilots, EPRI has just started our next
23 pilot. Don Moore is going to be busy for the next
24 couple years. We're doing some things we didn't do
25 before.

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1 We're taking a margins plant and trying to
2 convert it into an SPRA. And those kinds of things,
3 those lessons learned, won't be known - this will be a
4 two-and-a-half-year effort.

5 So, you're talking about trying to
6 implement this for a lot of plants while we're still
7 trying to do the piloting of these things.

8 As I said, we'd like to get the NRC
9 directly involved in that so that we can get your
10 insights as we go in those decisions and we don't have
11 a surprise at the end of the process.

12 Training, we talked about a little bit.
13 EPRI has a program. We put it on. We thought we were
14 only going to do one this year, but now we're doing
15 two.

16 It was over-subscribed. The NRC people
17 have attended that training and it's a universal thing
18 that we all need to know a little bit more about it in
19 order to apply it.

20 So, yes, it's ongoing, but one of our
21 discussion points was - and one of the feedback we got
22 on a one-week course, you really need to expand that,
23 you know.

24 You come out of that one-week course and
25 you're not a guru. Surprise, surprise. Maybe you end

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1 up doing this in several weeks like the PRA course
2 that EPRI has where I don't know how many weeks it is.

3 But if you really want people to be
4 trained to be able to do this in any detail, it's a
5 lot bigger training effort. Usually it happens on the
6 job.

7 The guys from Dominion participated for
8 several years on the Surry PRA plant. And at the end
9 of that, they were pretty darn good, but it's not
10 going to happen overnight. So, we're going to have
11 that resource problem no matter what you did.

12 Even if today you shoved all the money at
13 it, you know, nine women and a month doesn't make a
14 baby. You've got to go through the process.

15 And the last kind of thinking is, and our
16 thinking is, IPEEE really took - I don't know. '91
17 came out. And then another one came out in '94. And
18 I think it was ended up being a five-year not even
19 counting all the pre-work before the Generic Letter
20 came out. And that didn't include all the RA back and
21 forth.

22 It was a program of at least five plus
23 years. And then as you pointed out, it really wasn't
24 uniform. And some of the things done you'd like to
25 improve on.

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1 So, you can come up with a short-term
2 squeezed schedule, but you're going to get what you
3 get out of it. You're going to have to be squeezing
4 somewhere on that quality of what you want to get out
5 of this in the long term.

6 So, fire PRAs I have not been involved
7 with. But in some - in yesterday's discussion and
8 some of the people -- probably speak to, they voiced
9 that we don't want to repeat some of the problems we
10 had on that one. And that everybody kind of did them
11 at once, and it turned out to be kind of a little bit
12 chaotic. Let's put it that way.

13 So, in a decade you may be retired, Pat,
14 but I think in the long run we need, as we've said, to
15 kind of step through this, get some important
16 elements. If you guys are open to staging this in
17 priorities, I think that's the solution even if you
18 maximized all these other things.

19 And over time if some of this research
20 comes to fruition on the hazard, on the fragilities,
21 on the quantification, it may just play into a little
22 bit more pragmatic longer-term kind of a process.

23 MR. MOORE: This is Don Moore.

24 I think to kind of back up what Greg says,
25 that's one reason we were discussing using the IPEEE

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1 SMAs and the SPRAs. Even though they're twenty years
2 old, at least there's something to start from.

3 And it's obvious that a lot of work needs
4 to be done, but it is some data that exists and that
5 can, we feel, be reviewed and updated in a reasonable
6 period of time.

7 MS. GLENN: We have a commenter.

8 MR. COE: Yes, thank you. This is Doug Coe
9 with the Division of Risk Analysis in the Office of
10 Research.

11 I think I heard Greg say that you were
12 going to send us a new letter on PRA standards. So,
13 maybe I can delay my response a little longer until I
14 get that letter.

15 (Laughter.)

16 MR. COE: We can talk about that later.

17 One thing I'd like to contribute, I don't
18 know if this is a valuable contribution or not, but in
19 hearing the discussion about going back to the IPEEE
20 and looking at that and re-looking at that, perhaps
21 updating it and thinking about how that can help us
22 move forward here, I wanted to just relate that when I
23 came into this job about two years ago, I started to
24 hear about the good work that Marty Stutzke and Jon
25 Ake were doing with this Safety Risk Assessment. And

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1 I joined Pat Hiland in expressing a great deal of -
2 well, a great deal of support for that. And that it
3 was a good - it was a very good product. I don't want
4 to lose sight of that.

5 When, you know, the IPEEE analysis came
6 in, you know, there were some seismic margins analyses
7 plants in there.

8 The work that Marty and Jon has done has
9 actually advanced essentially the state-of-the-art, I
10 think, in taking those - that kind of data that
11 existed about that time frame. And that was the data
12 that they were using was publicly available, and still
13 today is publicly available. And converting that data
14 or those insights into something that was comparable
15 to our risk standards.

16 Although it wasn't a screening analysis,
17 it wasn't the purpose of that analysis to be a
18 screening analysis, one could look at it and kind of
19 form that perspective.

20 And as the industry thinks about using the
21 IPEEE, particularly the SMA plants, as a possible
22 first step, if you will, for this kind of a process,
23 if you would consider updating the changes that were
24 made to the plant, because that was one of the things
25 that we knew that we didn't have complete knowledge

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1 of, include the latest information on the GMRS and
2 seismic hazard, consider advancing even what Jon and
3 Marty have done to include perhaps containment and
4 spent fuel pool considerations, if you were to do
5 that, well, you could be advancing what they - the
6 good work that they've already done.

7 So, I didn't want to lose that thought -
8 or I wanted to contribute that thought because, again,
9 just like the IPEEEs were a good effort at the time,
10 they did have a certain variability, as we had pointed
11 out.

12 But the work that Jon and Marty have done
13 has somewhat normalized and made more consistent a
14 method for converting some of that information into a
15 risk metric. And that might be useful in this effort.

16 That's all I wanted to contribute.
17 Thanks.

18 MR. CHOKSHI: Let me -- just a point of
19 clarification, I think. I don't think we have ever
20 said that you don't use the information from IPEEE.

21 It makes sense to use the information
22 which you would - you don't need to duplicate the same
23 information, okay. That's - I think the crux lies
24 into how you could update, how you - what you going to
25 use it for, how can we deal with the subsequent

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1 evaluation, okay.

2 I don't believe - I just want to make sure
3 that I - I don't see it doing same work twice. So,
4 whatever you can use, definitely you should use.

5 MR. MOORE: This is Don Moore.

6 I understand that our goal is to try - is
7 to explain some options where we - how we would use
8 this data and so that you, the NRC, can look at it and
9 see how it will be used.

10 MS. GLENN: All right. Shall we open up
11 the phone bridge for public comment?

12 MR. HILAND: Questions from the public.

13 MS. GLENN: Questions. Are there any
14 questions from the bridge?

15 (No response.)

16 MS. GLENN: Okay. We'll take that as a no.

17 MR. HILAND: Let's go to Slide 17. They
18 told me I had the schedule and timeline, because I
19 will be around a long time, but not ten years.

20 Anyway, we plan to try - my goal is to get
21 the Generic Letter or generic communications out by
22 the end of the year.

23 I have six months left - well, seven
24 months, and I have a lot of work to do to get that
25 out, but that is a goal that I've set. And it's

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1 actually a little bit later than what I had hoped. I
2 think I said last October I was working on the spring
3 of this year. Things have changed.

4 The "provide seismic hazard results" we're
5 throwing out 180 days post-Generic Letter. So, a year
6 from today is the thought that we had before this
7 meeting.

8 Of course we would look at the screening
9 evaluation process. I would encourage you to put to
10 paper some of the thoughts that we heard today. I
11 think that would be important for us.

12 And in fact you're right, Alex, when we
13 come out with the draft, you'll have another
14 opportunity to comment on it.

15 And as we said, I have to go through some
16 hoops through the ACRS, the Committee to review
17 generic requirements and explain how we resolve those
18 comments, as well as through the Commission. At least
19 through the technical assistance on that.

20 Selection of the plant evaluation
21 methodology, again, we heard a lot of good thoughts
22 today. Some of which I heard amongst ourselves. So,
23 we're not surprised.

24 I think I advised Kimberly before the
25 meeting, that we were going to come out throwing

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1 seismic PRA, everybody do it in six months on the
2 table and see what kind of reaction we got. And I
3 think we got the reaction we expected, except for the
4 - from California. They were okay with that. So,
5 thank you.

6 Anyway, perform plant evaluations, we have
7 talked about that, the staggered schedules. We all
8 have in our minds what that means. I think my ideas
9 are maybe different than others, and hopefully we'll
10 work that out between now and certainly subsequent to
11 the draft generic communication and the public comment
12 period.

13 I would like your ideas on what you think
14 would be appropriate staggering of plants. I mean, I
15 could talk off the top of my head and give you my
16 thoughts, you know.

17 I think that if I'm a plant whose change
18 in seismic risk is in our target range, which is the
19 continued target range, and I did a seismic PRA twenty
20 years ago, I'd like to go back and revisit that if it
21 was my plant. And I'd like to go back and revisit
22 that as a high priority.

23 If I have -- way down in the grass and
24 believe that I can go through and update my IPEEE and
25 go back and look and see that my GMRS is below my SSE

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1 - I'm using acronyms that I promised I shouldn't do,
2 but the Ground Motion Response Spectra and the Safe
3 Shutdown Earthquake - my staff tells me that they
4 would listen to a screening level there, but still go
5 back and confirm the IPEEE and I don't think that
6 should take very long. As well as I don't think if
7 I'm in that category, that I should take two years or
8 three years, but that's just my thoughts out of the
9 box.

10 Now, if I'm a plant that I'm in that
11 category that the NRC is interested in, the continue
12 region, and I did a seismic PRA or a seismic margin
13 analysis twenty years ago and the screening doesn't
14 help me, then I think, well, I've got to update my
15 seismic margin and I'm fifth on the list to get
16 training, well, maybe I need some time, I think we
17 would be receptive to that kind of information.

18 I'm just talking off the top of my head.
19 I'd like to hear - not today if you're not ready, but
20 if you are, fine, but I'd like to hear from industry
21 as to what your thoughts are on that.

22 MS. KEITHLINE: I have one question, Pat.
23 This is Kimberly Keithline.

24 On this slide with the 180 days, I think
25 if we're talking six months from the time that the new

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1 source model is available to being able to do the
2 comparison of is your new GMRS below or bounded by,
3 whatever the right description is, because they're not
4 exactly apples to apples, your SSE, to make that
5 comparison, I think we talked about that might be
6 reasonable in about six months.

7 But once we get into talking about other
8 possibilities like if we compared the GMRS to an
9 updated, verified RLE, that I got the impression that
10 might take longer to do.

11 And so, I just want to make sure that we
12 have a common understanding of what you might have in
13 mind for that first six months to achieve there in
14 terms of if it's a screening that does the first kind
15 of look at GMRS compared to SSE, that might be
16 reasonable.

17 MR. MANOLY: This is Kamal Manoly.

18 You are correct. That's - we were
19 thinking GMRS and the SSE and if it's bounded by the
20 SSE, I mean --

21 MS. KEITHLINE: And then did you have in
22 mind that at the time that at that point six months
23 into it, that the plants would submit the results of
24 that comparison along with, at that time, a
25 recommendation for how to -

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1 MR. MANOLY: Yes.

2 MS. KEITHLINE: What, if anything, to do
3 next. You might not need to do anything if your GMRS
4 is bounded by your SSE.

5 So, is that the point at which we would
6 then be deciding how to -

7 MR. MANOLY: The methodology that you're
8 going to follow to - because the - we have a bunch of
9 plants that are not going to be bounded.

10 So, we were looking for what the approach
11 that they're going to be selecting in terms of options
12 given in the generic communication.

13 MS. KEITHLINE: Okay. And in terms of
14 prioritizing or staggering, is there any - are you
15 thinking about this first thing within six months that
16 everyone would do, or that you would somehow do a
17 subset?

18 DR. MUNSON: Yes, I think we were thinking
19 that everyone would do the hazard in six months.

20 MR. MOORE: This is Don Moore.

21 So, one of the challenges, I mean, I'm not
22 saying that's not feasible. I'm just, you know, from
23 the industry point of view, we have to make sure that
24 when we do get the model, you know, we can get
25 relatively quickly if Robin - I'm sure we can.

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1 But in getting site apps is we - I think
2 the industry needs to start working on that to make
3 sure that we provide soil properties that are, you
4 know, somehow or another have been validated or - even
5 if we're not doing borings, but we have an assessment.

6 Because a lot of that data, it doesn't
7 relate to shear wave velocity or things like that.
8 Those FSARs don't normally have that kind of - some of
9 that information.

10 So, that's something we need to be doing
11 pretty soon such that when we do get the hazards, we
12 go through the site app so we can actually -

13 MR. MANOLY: This is Kamal Manoly.

14 You have a window between now and end of
15 the year to, you know, scrub that information, right?

16 MR. MOORE: That's why I mentioned it.
17 Thank you.

18 MR. LI: This is Yong Li.

19 Since you mentioned the soil
20 investigation, and also we have a bullet actually in
21 the previous slides, I think Slide 9, mention that you
22 can actually use original site investigation.

23 So, you are talking actually beyond
24 original site investigation; is that right, if I
25 understand correctly?

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1 MR. MOORE: No, no. I'm just saying that
2 we need to have the right people pull that information
3 out of the - so, I mean, it's not - I don't think that
4 if you go to some of the FSARs that you can readily
5 pull out the information that would be appropriate to
6 use in a site response.

7 I mean, it's there and we're not
8 suggesting that we do any borings or whatever. I just
9 think that we feel that we need to go through those
10 FSARs and make sure that we define where hard rock is
11 and what we've now defined as hard rock and what the
12 soil properties are from the hard rock up to the
13 surface.

14 Also, we would probably have to look at
15 where the SSE is defined. Certain licensees have
16 their SSE defined at different locations. So, we just
17 need to kind of have that kind of information so that
18 when we provide you something, it's consistent with
19 our design, the SSE and makes sense.

20 MR. LI: But since we are talking about the
21 hazard screen here, so to compare the GMRS and the
22 previous SSE, define on the same level.

23 So, my question to you is that if you
24 don't have the soil shear velocity profile, plus the
25 soil degradation curves, how much we can really

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1 characterize a site using the original, so-called
2 original site investigation which, to my knowledge, is
3 quite different from the nowadays level, the scrutiny
4 because they - as I understand it, some sites just use
5 MMI, then put that on the - using the relation between
6 MMI and PGA and put on the hard rock then say multiply
7 by two becomes the surface SSE.

8 MR. MOORE: The purpose is to use existing
9 information, but use it in an intelligent way. And
10 that means that we would have people looking at it
11 that would provide a good estimation of what those
12 properties are.

13 We would then have to account for the
14 uncertainties when we do the site response.

15 MR. LI: Of course I should take a step
16 back for the hard rock site that may be not a problem.

17 But for the deeper soil site, those going to be how
18 do you -

19 MR. MOORE: I agree that there's challenges
20 there, but the challenges are that we assess that data
21 in a way that we, you know, we can have a basis to say
22 this is - this is the shear wave velocity variation,
23 this is the shear wave velocity profile that it has
24 and we can use approximate degradation curves that we
25 can stand behind based on the information that we

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1 have.

2 MR. HILAND: I would be remiss if I didn't
3 - Mr. Li is the newest member of my division thanks to
4 Nilesch.

5 He moved over two weeks ago and I've given
6 him the assignment of GI-199 as his first effort.

7 MS. GLENN: We'll open up for questions and
8 comments from the folks in the room.

9 MR. KRUEGER: Greg Krueger, Exelon.

10 As you could well imagine, we were talking
11 about resources and timing and we have ten of
12 everything. So, you know, doing something in six
13 months means doing ten things in six months. So, I
14 wouldn't necessarily, you know, agree with all the
15 numbers.

16 What occurs to me is that when we did the
17 initial screening, the initial screening was using new
18 hazard information, but using old plant information.

19 We're essentially taking that new
20 information and putting it in a model of the plant
21 that existed 15 to 20 years ago.

22 The first step I think should be along
23 what Mr. Moore is thinking, is; one, verify that we
24 did make some changes; two, what does the plant look
25 like today relative to that new hazard, okay, because

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1 we're making a lot of assumptions and a lot of work
2 based on information where we're only changing one
3 variable.

4 I know, you know, from doing internal
5 events analyses that over the course of 15 years, our
6 CDFs from internal events just because of the other
7 aspects, not seismic, have gone down a factor of two
8 to three.

9 I mean, you know, better reliability,
10 better unavailability, changes to the plant,
11 modifications to the plant, those things need to be
12 considered first, you know, so that we are comparing
13 apples and apples.

14 We start from the correct baseline, which
15 is the plant that's built and operated today, and then
16 move on from there as we do our analysis.

17 Otherwise, we're mixing all this new
18 information with some old information, and it would,
19 you know, in the end I think be unclear what actually
20 was the driver to make the change, you know.

21 What really changed the risk to the
22 public? Was it really, you know, some new aspect of
23 the hazard, or were there changes to the plant?
24 Thanks.

25 MR. CHOKSHI: I think that's true. I think

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1 that's what we're talking about that and is that
2 approach done and we discuss it's too - hazard is the
3 first thing, and then you also look at the - update
4 the plant information too, you know.

5 MR. MANOLY: This is Kamal Manoly. I guess
6 we're talking about two different schools of thought
7 here.

8 The first one is comparing what your
9 design basis earthquake to whatever the most up-to-
10 date understanding of the hazard at the site
11 regardless of what the plant condition is.

12 I mean, we're assuming that the plant
13 operating because it's safe, you know. And - but if
14 the hazard has changed drastically, then that will
15 lead us to further look at other things.

16 But if the hazard is, you know, is below
17 the SSE, then the - let's look at the purpose of the
18 GI.

19 MR. CHOKSHI: I think if the GMRS is at all
20 the frequencies below than the SSE, it basically says
21 your risk, if anything, has not gone up, you know,
22 unless you have done something - if you remove a
23 system. Then that's a different situation.

24 But as you mean that there is no drastic
25 change like that, your plant risk -- it says that it

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1 is what it is at the best.

2 MR. MANOLY: Right.

3 MR. CHOKSHI: Or it has gone down, okay. I
4 think that's the basis. In our decision making - I
5 think we need to -- the criteria we are using to
6 screen and go to the next evaluation because it's at
7 the risk-informed insight, okay.

8 MR. MOORE: This is Don Moore.

9 I mean, I totally agree with you, Kamal.
10 I mean, our plants are maintained and we have a
11 license commitment to make sure that their design
12 stays at the SSE level, I mean, at least that, and we
13 think they're higher than that.

14 So, we can make an immediate comparison to
15 that, and that we don't need to do verification
16 because that's part of our licensing basis.

17 But if we want to show either through
18 something like a seismic PRA that was done back
19 through IPEEE, or an SMA where we have a Review Level
20 Earthquake, then we just - since that was done so many
21 years ago, we have to do something to verify to you
22 that that's an adequate hazard or spectra to compare
23 to.

24 MS. GLENN: Thank you. Other questions
25 from the folks in the room?

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1 MR. STONE: Jeff Stone again from
2 Constellation.

3 I was just questioning when we - you
4 mentioned the selection of plant evaluation
5 methodology here, and we've discussed a lot of that
6 already, but I'd expect the Generic Letter is going to
7 give us some idea what our options are going to be and
8 what the criteria is for each one.

9 We don't want to be - it's nice to have
10 some certainty when we're applying to something like a
11 Generic Letter, on what's going to be expected for
12 each criteria.

13 MR. HILAND: Yes, I believe that was the
14 thought process we had is to provide options for
15 facilities.

16 MR. STONE: I would expect it possible to
17 have some criteria on how you fall in the screening
18 evaluation to determine - I don't want to be uncertain
19 on if I provide a methodology, that it is going to
20 meet your expectations and have to, you know.

21 MR. HILAND: Okay. Thanks.

22 MS. GLENN: Any questions or comment from
23 anyone in the room?

24 MR. LETTIS: This is Bill Lettis with Fugro
25 William Lettis and Associates. I just wanted to

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1 comment on the 180-day schedule that it might sound
2 like we acquiesce that it's doable at 180 days.

3 I think that's an extraordinary challenge
4 to perform both the rock hazard, and then site
5 response analysis at all of these sites within 180
6 days. Especially given the variable quality of
7 subsurface information that exists at each site.

8 Some sites have very good information that
9 could even be supplemented with existing, more recent
10 coal application information. So, there's some very
11 high quality information at some sites, to very little
12 or no good information at some sites.

13 And so in the spirit of consistency of
14 getting a good GMRS that has a consistent level of
15 confidence, I think we'll be challenged.

16 And, you know, there's a lot of steps
17 maybe that could be taken in the interim between now
18 and the end of this year where these - the industry in
19 sort of a proactive way begins to look at their site
20 information.

21 Those that have limited information may
22 need to do something and -- if they want to bring it
23 up to a consistent level.

24 But even given that we have information at
25 every site, getting ninety site response analyses done

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1 in several months will challenge the resources, I
2 mean, the people capable of doing that work.

3 So, I would suggest some type of a
4 staggered schedule there also.

5 DR. MUNSON: Perhaps I could comment. This
6 is Cliff Munson.

7 You probably are aware that some work was
8 done in an EPRI report called G-1.1 where we looked at
9 the performance-based approach. And I know site
10 response was done for a number of sites.

11 I'm not sure of the pedigree of that site
12 response, but I know that at least probably thirty
13 plant sites had some site response done for that
14 report.

15 MS. GLENN: Other questions in the room, or
16 comments?

17 (No response.)

18 MS. GLENN: All right. Let's open the
19 bridge line and take questions and comments from all
20 the participants on the bridge.

21 MR. BHARGAVA: This is Divakar Bhargava
22 from Dominion, and I'd like to - perhaps Nilesh can
23 answer this.

24 On Slide 7, there is a - the title is
25 "Information Needs for Proposed Generic Letter." And

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1 the last three bullets, I'd like to understand what
2 kind of detailed information would NRC need on those -
3 on fragility information, contributors to seismic risk
4 and identification. Could you amplify those three
5 bullets, please?

6 MR. CHOKSHI: I'll start, and the other
7 people may join. I think let's talk about the third
8 and fourth first; contributors to seismic risk and
9 identification of potential plant-specific
10 improvements.

11 Marty explained this morning about what
12 are the GI process and how when you go past the
13 regulatory analysis and then when you have to look at
14 some plant-specific, what information you use, okay.

15 And that you need to use things like core
16 damage frequencies. And you need to know what are
17 your contributors and what are the potential
18 improvements, okay, so you can do the additional
19 analysis to -- value impact type of analysis.

20 The fragility information you can look at
21 and one of the thought behind that was that if you
22 have sufficient information in terms of multiplying
23 the fragility and the key components, so we can do a
24 more meaningful review and evaluate. We can look at
25 some of the sensitivity, and that's also the basic -

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1 this goes in part to the concept of having a method
2 which can be used as information changes or we can do
3 sensitivity analysis.

4 So, it will be the fragility information
5 at the plant level, and as well as some of the key
6 contributors and key components.

7 MR. BHARGAVA: Just to follow up on that,
8 are these three pieces of information, would they be
9 based on the updated site-specific hazard curves that
10 would be developed perhaps middle of next year, or are
11 you looking for this information with the current
12 estimates of fragilities that plants may have?

13 If I understand it correctly, you probably
14 mean this information once we have the new site-
15 specific hazard curves.

16 MR. CHOKSHI: Right. The updated
17 information. What you will use in your ultimate
18 analysis, right.

19 MR. BHARGAVA: Okay. Okay. Thank you.

20 MR. MANOLY: I'd just like to add at the
21 lunch break we were talking among ourselves. And it
22 was a good idea, really, that came up that with the
23 generic letter should be some guidance documents that
24 spells out lot of the concepts here, what type of
25 specific parameters or what kind of approaches will be

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1 acceptable.

2 And I encourage that when you send us your
3 comments, is to give us some feedback in that area so
4 that we - I'm not looking for something like we did
5 for USI A-46. It took several years to develop.
6 That's not what we're looking for. That took forever.

7 But something at least that's usable and
8 that can be developed maybe in, I don't know, five
9 pages or whatever it takes, but not, you know.

10 We have to have some guidance document
11 that spells out what we're looking for in terms of
12 some of the parameters we're asking for.

13 MS. KEITHLINE: This is Kimberly Keithline.

14 It almost seems like now going back and
15 looking at Slide 7, that some of the specific things
16 listed on this slide might be appropriate if you go
17 down a certain path with a certain option. Those
18 might be important if you're subsequently doing new
19 seismic PRAs for everyone.

20 But depending on what option we pursue or
21 how plants screen out if some number of plants - if
22 you end up going with the way that if they show that
23 the new GMRS is bounded by the SSE and nothing more is
24 needed, then it seems like some of these things might
25 not apply to all the plants.

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1 Now that we've had all this additional
2 discussion, it's not clear that just a request for all
3 this information from everybody will end up being the
4 way you necessarily go.

5 MR. MANOLY: I think you're - I mean, it
6 depends on what approach you're going to follow or
7 what direction you're going to take. But in either
8 direction, you have to have some idea what is
9 acceptable parameters you're going to use.

10 MR. CHOKSHI: Yes, the slides are
11 structured as you're going all the way into the
12 process.

13 MR. MANOLY: Right. From A to Z.

14 MR. CHOKSHI: Can I ask a question? And
15 maybe I'm preempting here.

16 What I would like to know - we talked
17 about number of things. And I think as Kamal said and
18 Pat said, as much feedback you can provide to us at
19 this time I think is very valuable, you know, because
20 we discussed a number of thoughts.

21 And what you're doing in your -- is mature
22 enough and we should look at it, I like to get some
23 idea of the time frame. When we get that, that will
24 help us moving forward.

25 MR. MARION: Less than ten years. This is

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1 Alex Marion.

2 (Laughter.)

3 MR. MARION: One of the things we'll need
4 to do is get together and kind of digest what we heard
5 today, and then try to figure out what the schedule
6 is. And I would think within a week we can give you a
7 date of when we could provide you something to support
8 the writeup that Don was talking about.

9 MS. KEITHLINE: Yes, I think, though, that
10 we'd also want to consider when it would be most
11 useful to NRC, you know, and we can just see how we
12 can prioritize our own work depending on if it's, you
13 know, please let us know if there's something in your
14 plan of activities between now and issuing a draft
15 letter in August where it's a really important point
16 that, man, if you have some additional information, it
17 can be factored into a certain step.

18 I mean, these guys - it's actually very
19 hard to get them simply because they're going from -
20 they're like in multiple meetings and traveling around
21 the world and all this stuff.

22 But if they recognize that there's a key
23 point at which it would sure be helpful to you to have
24 this information, if there's something about two weeks
25 from now that is a lot different than the third week

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1 of July, that would help us prioritize our activities
2 to give you what you need while they're still doing
3 their real jobs.

4 MR. HILAND: This is Pat Hiland. I
5 apologize.

6 Without consulting my colleagues, I'll
7 restate what I said. I'd like to get something
8 started as - no later than the end of the first week
9 of June. I think that's June the 8th or something
10 like that.

11 We could talk offline and maybe even we
12 want to come in and have another meeting with just
13 representatives, not the - so you can come in and
14 explain what you're going to present or what your
15 suggestions are that we can input.

16 MS. GLENN: Another question from the
17 bridge, please?

18 MR. MCGUIRE: Yes, this is Robin McGuire
19 with Fugro William Lettis.

20 Let me just second the comment that Bill
21 Lettis made on that 180-day schedule. And the problem
22 I think I would support is that getting the site-
23 specific data from utilities where the ownership of
24 the utility has changed hands maybe a couple of times.

25 And I don't think any industry group would be

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1 comfortable going ahead making assumptions without
2 approval from the ownership of that plant.

3 So, you know, I could see it taking three
4 months just to get data and everything assembled for
5 each plant in order to start a site response analysis.

6 So, I would suggest nine months or a year
7 for that time schedule. I'll stop there. Thank you.

8 MS. GLENN: All right. Thank you. Is
9 there another comment or question from the bridge?

10 (No response.)

11 MS. GLENN: Are there any other comments or
12 questions in the room?

13 MR. MARION: Yes, this is Alex Marion.

14 Let me just thank the NRC. I found this a
15 very informative and I think very productive
16 discussion. And we're looking forward to working with
17 the staff to make sure that the right information is
18 provided to successfully disposition and resolve this
19 issue.

20 MR. HILAND: Thank you, Alex. And this
21 concludes the meeting. But as I said at the
22 beginning, some of my staff are willing to stick
23 around and answer questions or entertain a dialog on
24 something that you may not have understood during the
25 meeting. Thank you.

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1 (Whereupon, the above-entitled matter went
2 off the record at 2:55 p.m.)

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