

# **Official Transcript of Proceedings**

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Fukushima Subcommittee

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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
(ACRS)

+ + + + +

FUKUSHIMA SUBCOMMITTEE

+ + + + +

REVIEW OF TASK FORCE REPORT

RECOMMENDATION 2.3 DOCUMENTS

+ + + + +

TUESDAY

MAY 22, 2012

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ROCKVILLE, MARYLAND

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

1 SUBCOMMITTEE MEMBERS PRESENT:

2 STEPHEN P. SCHULTZ, Chair

3 J. SAM ARMIJO

4 DENNIS C. BLEY

5 HAROLD B. RAY

6 JOY REMPE

7 MICHAEL T. RYAN

8 WILLIAM J. SHACK

9 JOHN D. SIEBER

10 GORDON R. SKILLMAN

11 JOHN W. STETKAR

12 NRC STAFF PRESENT:

13 DEREK WIDMAYER, Designated Federal Official

14 NILESH CHOKSHI

15 CHRISTOPHER COOK

16 ANNIE KAMMERER

17 JIM ISOM

18 ALSO PRESENT:

19 JIM RILEY

20 RICHARD STARCK

21 KIMBERLY KEITHLINE

22

23

24

25

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

8:30 a.m.

CHAIR SCHULTZ: [presiding] The meeting will now come to order.

This is a meeting of the Advisory Committee on Reactor Safeguards, Fukushima Subcommittee. I am Stephen Schultz, Chairman of the Subcommittee.

ACRS members in attendance include Sam Armijo, Dennis Bley, Harold Ray, Jack Sieber, John Stetkar -- Mike Corradini will join us later -- Joy Rempe, Dick Skillman, Bill Shack -- Sanjoy Banerjee will joins us later -- and Mike Ryan.

The purpose of this meeting is to discuss with the NRC staff the draft guidance documents being prepared to fulfill Recommendation 2.3 of the Fukushima Near-Term Task Force Report to Conduct Walkdowns for Seismic and Flooding Vulnerabilities.

This entire meeting is open to the public. Rules for the conduct of and participation in the meeting have been published in The Federal Register as part of the notice for this meeting.

The Subcommittee will gather information, analyze relevant issues and facts, and formulate proposed positions and actions as appropriate. The

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1 Subcommittee does not plan on proposing a letter  
2 report on this matter for consideration of the full  
3 Committee at the outset of this meeting, but this  
4 could change, depending on the results of the  
5 Subcommittee's deliberations following the  
6 presentations today.

7 Derek Widmayer is the Designated Federal  
8 Official for this meeting.

9 A transcript of the meeting is being kept  
10 and will be available on the web.

11 We have not received any requests from  
12 members of the public to provide comments. However,  
13 I understand that there may be individuals on the  
14 bridge line who are listening in on today's  
15 proceedings.

16 It is requested that speakers in the room  
17 and on the phone first identify themselves and speak  
18 with sufficient clarity and volume so that they can be  
19 readily heard. Thank you.

20 In the meeting today we have two topics to  
21 discuss, and the agenda shows that after each topic we  
22 will have discussion with the Subcommittee.

23 We will now proceed with the meeting, and  
24 I call upon Niles Chokshi from the Office of New  
25 Reactors to open the proceedings.

1 Nilesesh?

2 MR. CHOKSHI: Thank you, Dr. Schultz, and  
3 thank the ACRS for giving us an opportunity to come  
4 and talk to you about these important and one of the  
5 first activities related to the Fukushima  
6 implementation of the 50.54(f) letter for  
7 Recommendations 2.1 and 2.3.

8 I think as you know, we are on a very past  
9 pace and we expect to endorse the guidance at the end  
10 of the month. We have right now the final version of  
11 the flood walkdown guidance. We are working on the  
12 seismic one. I think we expect to have it within a  
13 few days. So, we expect to issue this guidance with  
14 the NRC later with the appropriate endorsement by the  
15 end of May.

16 I think, also, just to introduce the  
17 speakers this morning, Dr. Chris Cook, at my right, he  
18 will be talking about sort of all of the walkdown  
19 process, the process we used and the flooding, and Dr.  
20 Kammerer will cover the seismic walkdown portion.

21 We also have industry representatives  
22 here, Kimberly Keithline and Jim Riley. So, they are  
23 the leading Task Force leaders from the industry side.  
24 And we have project managers Ed Miller and Chris  
25 Gratton.

1 I think what you will find, that all our  
2 objectives and general approach we are using for the  
3 boat area is common. Our objective is what type of  
4 schedules. But when you go over the details of each  
5 of the walkdowns, you will find significant  
6 differences because of the nature of the protections  
7 provided for each of the phenomena. And so, while the  
8 overall objectives are the same, the details do  
9 differ, and I think you will see that when you see the  
10 two presentations.

11 So, I think at this point in time we will  
12 just walk you through the presentation and then wait  
13 for your feedback and questions. With that, I am  
14 going to turn it over to Chris, unless there are any  
15 questions.

16 MR. COOK: All right. Very good.

17 Again, my name is Chris Cook. I am a  
18 Branch Chief in the Office of New Reactors, and I am  
19 also the lead for the flooding walkdown team.

20 If you can go ahead and adjust the second  
21 slide or third slide?

22 What I am going to be doing is going  
23 through and giving an overview of the general guidance  
24 that is in the 50.54(f) letter as well as some of the  
25 key considerations that were there that are part of

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1 the walkdowns for both the seismic and the flooding  
2 components.

3 To begin, I thought I would start with an  
4 abbreviated background. I know ACRS has been briefed  
5 before on the overall agency response to Fukushima and  
6 the different recommendations that are there. So, I  
7 thought I would start with SECY-12-0025. And there,  
8 in Enclosure 7, it contains the draft of the 50.54(f)  
9 letter. There was an SRM on the SECY that was issued  
10 on March the 9th, 2012.

11 So, some issuance details on the 50.54(f)  
12 letters that are there: first of all, the letters  
13 were sent out on March the 12th and they were  
14 addressed to all of the operating reactor licensees.  
15 The COL and CP construction permit-holders obviously  
16 do not need to go through and perform the walkdown.  
17 So, we are talking about the operating power reactor  
18 licensees today.

19 The purpose of today's meeting is really  
20 to talk about the walkdowns, which if you look in  
21 those letters, they are Enclosure 3 and Enclosure 4 of  
22 each of the 50.54(f) letters. So, I just want to make  
23 sure that everyone understood the scope of what we are  
24 talking about. It is just those two enclosures of  
25 this 50.54(f) letter.

1 Okay. Next slide, please.

2 To understand the walkdowns, sort of the  
3 general philosophy about what they are, what they are  
4 not, I thought it would be good for us to look at some  
5 of the general considerations from the 50.54(f) letter  
6 as well as the Near-Term Task Force Report, because  
7 these key considerations really set some of the  
8 overarching aspects that were there and sort of what  
9 we are going to be doing and what we are going to be  
10 accomplishing. These were put together both by the  
11 Near-Term Task Force as well as, then, as we were  
12 developing the letters, the Steering Committee that is  
13 there that is made up of all the Office Directors as  
14 well as a number of the Regional Administrators.

15 First of all, these walkdowns -- and this  
16 is from the Near-Term Task Force Report -- are to  
17 gather information in the interim period until longer-  
18 term are completed to update the design basis for  
19 external events. And what this is really saying is  
20 that these walkdowns are to be conducted before the  
21 hazard reevaluations are done. So, that is sort of a  
22 key important point, that they are not being done  
23 after the hazard reevaluations; they are to be done  
24 before the reevaluations to give us assurance during  
25 that interim period while the reevaluations are sort

1 of taking place.

2 As a reminder, we have Recommendation 2.1  
3 that is going to be looking at the reevaluation of the  
4 design basis hazards both for seismic and for  
5 flooding, and then taking additional steps, depending  
6 on what those results. So, this is sort of to fill  
7 that interim period while those hazard reevaluations  
8 are going on.

9 MEMBER BLEY: I expect there is a link you  
10 have, though, for that period. You must be looking  
11 for things that will affect, in particular, could  
12 affect that reevaluation. And you are going to talk  
13 about that in some detail, I hope?

14 MR. COOK: Exactly.

15 MEMBER BLEY: Okay.

16 MR. COOK: Exactly. Both Dr. Kammerer and  
17 I are going to be talking about sort of the nexus,  
18 because that was in there. When these were put  
19 together -- and that is one of the things I wanted to  
20 emphasize -- it wasn't that we just went in with a  
21 mindset that there was Recommendation 2.1, the hazard  
22 reevaluations and risk assessments and the walkdowns.  
23 They are integrated, and information from one does  
24 inform the other.

25 MEMBER BLEY: Good.

1 MR. COOK: And so, there is a connection  
2 and there is a nexus, and that will be used as we go  
3 through there.

4 The other sort of key point that I want to  
5 make sure that we get in there, too, is the second  
6 bullet. This is that degraded, nonconforming or  
7 unanalyzed conditions are going to be addressed  
8 through the licensee's already-existing Correction  
9 Action Plan.

10 Part of this is we go through and we do  
11 these walkdowns, when we do this, we are going to be  
12 developing a new process for dealing with any  
13 deficiencies that are going to be there. These are  
14 going to be put into the licensee's Corrective Action  
15 Plan, and we are going to be going forward in that  
16 way.

17 MEMBER SKILLMAN: Chris?

18 MR. COOK: Yes?

19 MEMBER SKILLMAN: Before you proceed --

20 MR. COOK: Sure.

21 MEMBER SKILLMAN: How should we think  
22 about that? Here is the example: you find that there  
23 are fire doors or openings or roll-up doors that are  
24 actually not able to withstand what could be a revised  
25 water level for the plant. Would that simply go in

1 the CAP or would you take some action out of the  
2 agency to make that a record action item for that  
3 owner?

4 MR. COOK: Before I answer that, let me  
5 just clarify your question to make sure I understood  
6 it correctly. First of all, the walkdowns are being  
7 done before the reevaluated hazards are going to be  
8 taking place.

9 MEMBER SKILLMAN: Right.

10 MR. COOK: So, the walkdowns are going to  
11 be done to the current licensing basis flood  
12 elevations that are there. So, they are going to be  
13 done and looking at those.

14 As they go through and they look and  
15 compare their flood protection to their existing  
16 licensing basis levels, if they found that they could  
17 not meet that, that would, then, be a deficiency. It  
18 would be put into the CAP and it would be resolved  
19 through those processes.

20 I also have some slides on a TI that is  
21 going to be in place, and the inspectors are also  
22 going to be going out and walking down to make sure  
23 the methodology is followed.

24 Yes?

25 MEMBER SIEBER: Yes, putting it into the

1 CAP, however, means it goes on the repair list and  
2 gets repaired right away.

3 MEMBER SKILLMAN: I certainly understand  
4 that. If it went into CAP, it would be a fix  
5 probably.

6 MEMBER SIEBER: Right.

7 MEMBER SKILLMAN: But I was thinking of  
8 this a little more broadly. I know that plants are  
9 assessing new hydrological data and how that impacts  
10 their present licensing basis, and owners are actually  
11 making changes at their plants to address that new  
12 information. So, what I was imaging is that the NRC  
13 staff may be taking additional action for those  
14 utilities that have found a revised water level that  
15 is different than the current licensing basis.

16 MEMBER RAY: Dick, it occurs to me we  
17 don't want to mix up changes to the design basis with  
18 addressing vulnerabilities, which is what I think you  
19 are talking about, to events beyond the design basis.

20 MR. COOK: Or a new design basis that may  
21 be set and looked at.

22 MEMBER RAY: Yes. I mean, I think you are  
23 talking about looking at vulnerabilities to an event  
24 that is in excess of the current design basis.

25 MEMBER SKILLMAN: I am. I am.

1 MEMBER RAY: Okay.

2 MEMBER SKILLMAN: Yes.

3 MEMBER STETKAR: Let me try something just  
4 because Dennis raised it, but I have kind of wanted to  
5 understand how these walkdowns you said kind of feed  
6 into the later effort.

7 If, indeed -- and we are not going to talk  
8 about changes to the design basis within this context  
9 -- but if, indeed, the change to the design basis in  
10 the future evaluates a higher flood level, would that  
11 require additional walkdowns to reassess the  
12 vulnerabilities of SSCs to that higher flood level?

13 MR. COOK: We are going to be going  
14 through in the 2.1, Recommendation 2.1 process that is  
15 going to be taking place, we are going to be going  
16 through and we will, then, be looking at it. And we  
17 have the options to do different agency actions at  
18 those points and to go forward. Whether or not they  
19 be a walkdown, I am not sure. But the purpose of  
20 these particular ones is to look at the current --

21 MEMBER STETKAR: Let me ask you, from the  
22 staff's perspective, would additional walkdowns be  
23 required? "Required" is too strong a term.  
24 "Encouraged" is probably a better term.

25 (Laughter.)

1 MR. COOK: I think it is the "required"  
2 part that I was --

3 MEMBER STETKAR: "Required" is not the  
4 right -- it is too strong.

5 MR. COOK: But we have all options still  
6 available to us at that point.

7 MEMBER STETKAR: What I am trying to get  
8 to is the notion of the 2.3 walkdowns the only  
9 walkdown that will ever be needed to resolve either  
10 the flooding or the seismic issues for both the  
11 current design basis and for any potential future  
12 reevaluation of the design basis?

13 MR. CHOKSHI: Let me, I think, answer that  
14 question a couple of ways.

15 In the 2. process, that is determining for  
16 the plants which needs to do an evaluation of the  
17 seismic. Because of the methods we are using, it is  
18 clear that you are going to need a second walkdown.

19 But the flooding and developing the  
20 guidance, my thinking is that you will need some  
21 supplementary walkdowns because you want to collect,  
22 as Chris will go through his presentation, (a)  
23 information, particularly in the flooding walkdown,  
24 which will be useful. And that will determine any  
25 particular body or something, if I need to go and look



1 at it again, or do I need to develop a process?

2 In seismic, I think it is clear-cut. In  
3 flooding, I think we need to work through that.

4 MEMBER STETKAR: Thanks, Nilesch. That  
5 helps me, anyway, because it helps me to more easily  
6 kind of separate the type of questions I might have  
7 regarding this particular set of walkdowns. Thanks.

8 MR. CHOKSHI: I think, also, the questions  
9 you asked -- well, one of the things, very few plants  
10 may have that situation. We are not going to that  
11 situation. We hope that when they go through that  
12 walkdown process they are looking at, also, whatever  
13 current programs they have. So, we are using the  
14 latest information.

15 MEMBER SKILLMAN: Thank you.

16 MEMBER SIEBER: I think that, just as a  
17 way to add what the process really does, when you have  
18 a design change, that is issued, puts in new  
19 requirements, and given to a design engineer, and  
20 there is a process for this.

21 Usually, the first thing he does is get  
22 out all -- or she does -- is get out all the drawings  
23 and try to understand what the design change is. The  
24 second thing is to go and walk it down to see if the  
25 current drawings match what is in the plant. And

1 then, the design process starts that will identify,  
2 for example, in flooding, where openings are, where  
3 doors are, and so forth. That becomes input to the  
4 design change process.

5 You will end up with a bunch of walkdowns  
6 through this whole process before you conform to a new  
7 design basis. And so, I think that what we are doing  
8 here is making sure that the plants comply with the  
9 current design basis. The design change process takes  
10 you to that next level. And there are walkdowns that  
11 are inherent in the design change process.

12 MEMBER BLEY: On your second bullet, you  
13 speak of degraded, nonconforming conditions, which is  
14 clear and how those would go into the CAP. Unanalyzed  
15 conditions seems to be putting a different kind of  
16 thing into the CAP than normally goes in the CAP,  
17 which is analysis, I suppose. But can you say  
18 anything about that?

19 MR. CHOKSHI: Yes. The examples of  
20 unanalyzed conditions, where you walk down and you  
21 find some sort of interactions type of issue, like  
22 Seismic 2 or 1, because of the changes in the plant  
23 which were not in the initial design. But now, when  
24 you walk down and you find that potentially it is  
25 safety equipment, but because it changed it was not

1 analyzed --

2 MEMBER BLEY: But there was actual  
3 physical conditions --

4 MR. CHOKSHI: Physical conditions, right,  
5 yes.

6 MEMBER BLEY: -- you need to protect or be  
7 analyzed?

8 MR. CHOKSHI: Right. Yes.

9 MEMBER BLEY: Okay. Thank you.

10 MR. COOK: So, with that, the third  
11 bullet, then, was actually going in -- the walkdown  
12 guidance that has been developed is going to be  
13 developed, first of all, by the licensees. The  
14 licensees have grouped together through NEI for  
15 flooding and I believe it is NEI and EPRI for the  
16 seismic.

17 They are developing a guidance document  
18 that is there. For the flooding document, the final  
19 version was yesterday. Hopefully, you all have that.  
20 For the seismic version, it is still continuing,  
21 though I believe Annie sent in a draft version --

22 MS. KAMMERER: Right.

23 MR. COOK: -- of most of the sections  
24 yesterday.

25 MS. KAMMERER: And we expect it tomorrow.

1 MR. COOK: Okay. So, those are being  
2 developed by the licensees. And then, the process has  
3 always been that we would, then, NRC staff would then  
4 be going through and endorsing this document. The  
5 reason for this is to have a common guidance document  
6 that would be out there for people to use, so that the  
7 expectations will be set ahead of time about what we  
8 expect to see that is coming back. And this is  
9 somewhat of a lessons learned from previous things  
10 that have been done, to know ahead of time what that  
11 guidance is, covering both the scope of the walkdowns  
12 as well as the report back to us.

13 MEMBER SHACK: I take it you didn't have  
14 this for the IPEEE?

15 MR. COOK: One of the things for flooding,  
16 for the high winds, flooding, and other, that was one  
17 of the things that was mentioned. You will see on my  
18 slides what they recommended from the lessons learned  
19 was that that should be done. And so, that was one of  
20 the things that we are taking forward and learning for  
21 the flooding area, in particular. Seismic is a little  
22 different. But definitely for the flooding area, yes.

23 CHAIR SCHULTZ: Nilesch, is the schedule  
24 associated with the endorsement what you referred to  
25 earlier?

1 MR. CHOKSHI: Right.

2 CHAIR SCHULTZ: That by the end of this  
3 month, you would have endorsed the documentation and  
4 processes?

5 MR. CHOKSHI: Yes. I think --

6 MR. COOK: Actually, the next slide, if  
7 you can go to the next slide?

8 MR. CHOKSHI: Yes.

9 CHAIR SCHULTZ: Thank you.

10 MR. COOK: I didn't mean to cut you off.  
11 Getting at exactly that question, I was just thinking  
12 maybe that Nilesch would appreciate having it in front  
13 of you. That was all.

14 (Laughter.)

15 Okay. Well, I will walk you through it  
16 then.

17 CHAIR SCHULTZ: Thank you.

18 MR. COOK: The 50.54(f) letter sets a  
19 pretty aggressive timeline, as Dr. Chokshi was talking  
20 about. First of all, we have held numerous public  
21 meetings with the industry groups that have been  
22 developing this guidance that had been there. I went  
23 on the website yesterday. They have been out there  
24 and published.

25 And I counted no less than 15 public

1 meetings. Some of these have been multi-day meetings  
2 that have been held just since the letters were issued  
3 in March. Fifteen is probably a significant  
4 undercount, but I didn't want to promise more than we  
5 had done. So, at least 15 that have been there.  
6 Again, some of these, many of these have been multi-  
7 day meetings that have been there. And this is,  
8 again, following the Commission's SRM to us to make  
9 sure to engage and have these public meetings and the  
10 communication take place in that type of a forum.

11 Industry, the NEI, like I said, is going  
12 to be submitting separate documents for the seismic  
13 and flooding. This is just to emphasize that there  
14 are going to be two different documents, one for  
15 flooding, one for seismic. It isn't all going to be  
16 one document that is together. It is going to be two  
17 different documents.

18 The 50.54(f) letter, then, laid out an  
19 anticipated date that the NRC would endorse the  
20 walkdown guidance. And that anticipated date, it just  
21 said by May 2012. So, I put May 31 as that date on  
22 there. But, again, this is the anticipated date, and  
23 you will see where that ties into the submittal date  
24 in a second.

25 Then, going along in chronological order,

1 on June 10th for flooding and July the 10th for  
2 seismic, each licensee has to confirm the guidance  
3 that they are going to be using to perform their  
4 walkdowns. So, even though this guidance is out  
5 there, the licensees could come back and say that they  
6 are using another one, although everyone has been  
7 encouraging them to use this guidance document that  
8 has been developed by industry and endorsed by the NRC  
9 in order to perform these walkdowns. But they are  
10 going to be coming back in for flooding here very  
11 soon, in a couple of weeks, to tell us which guidance  
12 they are going to be using.

13 Finally, the last step, and I put November  
14 27th out there, but, really, it is 180 days after the  
15 NRC endorsement. So, once the NRC endorses this  
16 guidance, the way this is worked out is the licensees  
17 then submit the walkdown reports to the NRC. So, that  
18 is how that due date is set.

19 So, if the endorsement for summaries  
20 stretches out longer, the walkdowns will be put in  
21 longer, but that is sort of how it is tied into, is  
22 that 180 days from endorsement. May 31 plus 180 is  
23 November 27th.

24 MEMBER SIEBER: And that also includes the  
25 seismic walkdowns?

1 MR. COOK: It is 180 days from the  
2 endorsement of the seismic walkdown guidance and 180  
3 days from the walkdown for the flooding.

4 MEMBER SIEBER: Now, having done a seismic  
5 walkdown many years ago, those are very complicated.

6 MR. COOK: Yes.

7 MEMBER SIEBER: It depends on the degree  
8 of detail that you are expecting the walkdown to  
9 produce. For example, hangers and supports, there's  
10 thousands of them. Unless you use a template, each  
11 one of them could be unique --

12 MR. COOK: Yes.

13 MEMBER SIEBER: -- which requires some re-  
14 analysis. Do you expect people to take longer than  
15 180 days and, if so, what are you going to do?

16 MS. KAMMERER: No. I mean, we  
17 specifically are working through the guidance with  
18 industry. The guidance is specifically targeted to  
19 meet the objectives of this particular program in the  
20 timeline of this particular program. So, we have put  
21 a lot of effort into making sure that it meets the  
22 goals and is still achievable.

23 MEMBER SIEBER: Okay.

24 MS. KAMMERER: And so, we will talk about  
25 it. We expect that the full process is completed and



1 a report comes in within 180 days. We will have a  
2 situation where some of the equipment is not  
3 accessible in that time period, in which case we will  
4 get a list of that equipment and schedule for when  
5 that will be completed, typically, with outages, and  
6 then a final report at the end.

7 But, hopefully, when you see exactly how  
8 we have set up the projects and the guidance, it will  
9 make sense. Because, you're right, there is different  
10 kinds of walkdowns, and some of them would normally  
11 take far longer than the time period at hand.

12 MEMBER SIEBER: You are not expecting re-  
13 analysis of individual hangers?

14 MS. KAMMERER: No.

15 MEMBER SIEBER: But you are expecting  
16 things like testing bolts to make sure that the  
17 embedments stay where they are supposed to stay?

18 MS. KAMMERER: Well, we will get to that.  
19 We are not testing the torque on the bolts. We are  
20 looking at the cable trays to make sure that they  
21 haven't been overloaded, and only at that point would  
22 it go into the CAP, rather than doing it a priori.

23 You will see that what we have done is we  
24 have separated out the project into what are called  
25 equipment walkdowns and area walkbys.

1 MEMBER SIEBER: Okay.

2 MS. KAMMERER: So, we are looking  
3 specifically at equipment, and then we are also  
4 looking at the area for unanalyzed conditions of  
5 potential 2-over-1 seismic flood and fire initiators,  
6 things like that. And so, I think as we go through  
7 our guidance, you will see some specific details.

8 MR. CHOKSHI: I think, Dr. Sieber, you  
9 characterized -- we are making sure the seismic  
10 walkdown in this timeframe.

11 MS. KAMMERER: Yes, exactly.

12 MR. CHOKSHI: And that was the --

13 MS. KAMMERER: The biggest challenge.

14 MR. CHOKSHI: -- the dialog with industry.

15 MEMBER SIEBER: Even checking the cable  
16 trays for overload, it could be difficult for plants  
17 that, when they were built, did not use pull tickets.

18 MR. CHOKSHI: Yes.

19 MS. KAMMERER: Yes.

20 MEMBER SIEBER: If you have pull tickets,  
21 then you can use your computers to find out exactly  
22 what is in each tray, whether it is overloaded or not,  
23 and you can do that in a couple of weeks. On the  
24 other hand, with no pull tickets, that is a tough job.

25 MR. CHOKSHI: Yes.

1 MS. KAMMERER: Yes.

2 MEMBER SIEBER: And there are a few plants  
3 out there like that.

4 MS. KAMMERER: Yes.

5 MEMBER REMPE: If a licensee does not go  
6 with the industry guidance, do they get an extension  
7 because the NRC has to go back and review this again?

8 MR. CHOKSHI: Let me explain, I think, and  
9 industry representatives are here. But the way the  
10 industry has set up task forces, there is a lot of  
11 enrollment of the representatives from the licensees.  
12 So, I think the interactions have taken place, and I  
13 think what I understand of the coordination the  
14 industry task force has done, I will be surprised if  
15 I see -- you know, maybe some isolated cases and some  
16 minor changes -- anybody taking exception with the  
17 walkdown guidance. In case they do take, I don't  
18 think that is automatically relief from the schedule.

19 MEMBER SIEBER: Thank you.

20 MR. COOK: Next slide.

21 This is sort of the last slide that I have  
22 here on the general overview that covers seismic and  
23 flooding, as I talk about some of the related  
24 activities that the NRC is doing.

25 I wanted to mention the Temporary

1 Instruction that is being developed. NRR, the  
2 Division of Inspection and Regional Support, is  
3 developing Temporary Instructions, TIs, for both the  
4 flooding walkdowns and the seismic walkdowns. You can  
5 see the number there, 2515/187 for flooding and 188  
6 for the seismic.

7 The flooding TI is currently out for  
8 regional comments. It is expected right now to issue  
9 that in June. That is going to be there.

10 The schedule for the seismic TI is several  
11 weeks behind. However, NRR expects to issue that in  
12 late June/early July.

13 The objective is for the NRC inspectors to  
14 independently verify that the licensees are conducting  
15 their walkdowns in accordance with the guidance  
16 methodology that has been specified.

17 The TI is also being initiated in  
18 accordance with the licensee walkdown schedule and  
19 closed when the inspection is complete.

20 Any questions on the TI?

21 MR. WIDMAYER: I am sorry, Chris, does  
22 that have to be completed before the 180-day report is  
23 submitted?

24 MR. COOK: I will look to -- there are  
25 some folks here from NRR, if they wanted to answer

1 about when the TI would be complete?

2 MR. WIDMAYER: Get to a microphone and  
3 please identify yourself, please. Microphone, please,  
4 the microphone, and introduce yourself.

5 MR. ISOM: Jim Isom. Can you hear me?  
6 Jim Isom from the Special Program Branch.

7 Yes, there is no 180-day requirement right  
8 now. The thought is to perform the walkdown together  
9 with the licensee when they are doing the walkdown.  
10 So, we are trying to issue the first TI-187 by May  
11 31st or soon thereafter, and the second portion is the  
12 independent walkdown. So, the independent walkdown  
13 may take longer than 180 days, depending on the  
14 inspectors' schedule.

15 MR. COOK: All right, very good.

16 With that, ed, if you would advance, I am  
17 going to go in and specifically be talking about the  
18 flooding walkdowns and the way that those are set up,  
19 and then walk you through a little bit of the NEI's  
20 guidances there in the guidance document.

21 First of all, to develop the new guidance  
22 that is here for the flooding walkdowns, we felt it  
23 was very important to take lessons from the past and  
24 to learn what has gone on before. Dr. Shack was  
25 talking earlier about the IPEEEs. We have looked at

1 those reports. And, in particular, NUREG-1742 lays  
2 out a couple of key, I think, nuggets or bread crumbs  
3 for us to sort of follow as we are developing this  
4 guidance and things to learn from that implementation.

5 One of the things that was there, first of  
6 all, high wind, flood, and other is what HFO stands  
7 for. And so, the high winds, the flood, and the  
8 others were all sort of grouped together into one sort  
9 or report. So, there wasn't one particular party,  
10 IPEEE, that was just dedicated to flooding.

11 The HFO submittals, the walkdown  
12 submittals, one of the things that was new in the  
13 report, it did not provide detailed descriptions of  
14 the walkdown procedures and the results. Trying to  
15 pull some of those now in 2012 and look at those  
16 details was a challenging thing to do. We tasked the  
17 library, went out, tried to pull as many of those as  
18 we could find, read through and look at them to see  
19 what was there. And I would concur with this  
20 statement that detailed descriptions are really not  
21 there.

22 This is a quote from that document: "A  
23 few the licensees proposed flood-related  
24 countermeasures may be optimistic." And so, that is  
25 one of the things that we wanted to do here, is to go

1 through our walkdowns and make sure that we are  
2 verifying these procedures, because a number of these  
3 things are procedures, and the countermeasures that  
4 were there. And so, you will sort of see that theme  
5 as we go through.

6 Also, the report stated that the IPEEE  
7 submittals did not discuss the confirmatory testing to  
8 verify the effectiveness of these flood-related  
9 countermeasures. So, we are just saying this; there  
10 was never any way to go through and verify that that  
11 was actually taking place.

12 Another document that we looked at, in  
13 1999 there was a reactor in France, Le Blayais. There  
14 was an event there in 1999 where they an issue with  
15 storm surge compounded by wind waves that ended up  
16 producing some flooding that was there.

17 We looked at the lessons learned report.  
18 This was an international document. WANO picked it  
19 up, and then the INPO one was the one that was cited  
20 because it was easier for access.

21 Specific things that they mentioned there  
22 as lessons learned were that cable openings and  
23 trenches were a common vulnerability requiring review  
24 and, also the flood's effect on support systems in  
25 surrounding areas were not adequate or were

1 inappropriate for the weather conditions.

2 And so, this was something that was picked  
3 up, is you really have to, with flooding, you have to  
4 consider the site conditions that were there with it  
5 and, also, make sure that when you have people  
6 requiring manual actions to go out, you are  
7 considering the weather that takes place with it. And  
8 so, that was one of the things that came out of here,  
9 and you will see that as a theme that has been picked  
10 up.

11 CHAIR SCHULTZ: Christopher?

12 MR. COOK: Yes.

13 CHAIR SCHULTZ: If we could go back?

14 MR. COOK: Sure.

15 CHAIR SCHULTZ: The confirmatory testing  
16 in the first grouping there --

17 MR. COOK: Yes.

18 CHAIR SCHULTZ: -- does that also mean  
19 confirmatory analysis as well as testing? Or are you  
20 focusing particularly on the absence of testing?

21 MR. COOK: Right now, we don't have  
22 anything in there about going off, because of the  
23 schedule, you know, to actually conduct a test. We  
24 are saying, are you verifying what you have? Are you  
25 verifying this in place, and do you have some



1 verification that is there that it is adequate? That  
2 is really what we are getting at with this. That is  
3 how that was implemented.

4 CHAIR SCHULTZ: Verification of some type?

5 MR. COOK: Yes.

6 CHAIR SCHULTZ: Thank you.

7 MR. COOK: Okay. Next slide, please.

8 Continuing on with sort of our lessons  
9 learned from the past, Temporary Instruction 2515/183,  
10 so you notice the 187 is the current flooding; 183  
11 that was there, this was issued almost exactly, well,  
12 it was issued more than a year ago, but it was  
13 immediately after the Fukushima event.

14 And really getting in for the flooding,  
15 the TI evaluated each licensee's capability to  
16 mitigate external flooding required by the station  
17 design. And so, there were a lot of questions  
18 initially about, well, what is the difference between  
19 what you are doing now versus what was done a year  
20 ago? And so, we have tried to make -- you know, there  
21 are definitely differences. There are a number of  
22 things that are new in this that we will be going  
23 through and talking about that we are getting into.  
24 You will see that.

25 Really, I just wanted to emphasize that

1 one of the things that came out of that summary was --  
2 and I thought this was a pretty important statement --  
3 the potential trend of failure to maintain equipment  
4 and strategies to mitigate some design-basis events.  
5 This is one of the findings. There was an overall  
6 summary of observations that NRC put out, and this was  
7 one of the statements that was in there.

8 MEMBER SKILLMAN: Chris, does that  
9 conclusion come from your having reviewed the CAP  
10 systems of the various licensees?

11 MR. COOK: No, this comes from the Summary  
12 of Observations document that was put out by NRC, and  
13 this is a quote that was there.

14 To me, that really gets at looking at the  
15 procedures, looking at the procedures that are there  
16 to go through and maintain the equipment and  
17 strategies. And so, again, it was taking that piece  
18 of information and saying that is what we need to  
19 emphasize, and then making sure that that got put into  
20 the walkdown guidance, so that we would have the  
21 review of procedures.

22 You will see where we are getting into a  
23 whole section called "Reasonable Simulation". That  
24 reasonable simulation gets exactly at looking at  
25 verifying procedures and actions that are there,

1 because they are so important when you look at  
2 protecting against flood.

3 MEMBER SKILLMAN: I understand that.

4 MR. COOK: Oh, okay. Sorry.

5 MEMBER SKILLMAN: For where you found  
6 those failures or since there were failures, did you  
7 determine whether the licensees had put that item in  
8 their CAP system?

9 MR. CHOKSHI: I think we don't know what  
10 happened. This was the inspection conducted by NRC  
11 inspectors right after Fukushima.

12 But in this program, when they find this  
13 situation, it will go into the CAP program.

14 MEMBER SKILLMAN: I guess I would like to  
15 explore that a little more. Because one of the herald  
16 comments that you have here on your slide 4 is that  
17 you are going to depend on CAP.

18 MR. CHOKSHI: Right.

19 MEMBER SKILLMAN: And I will salute you  
20 for wanting to do that. That is Appendix B to 10 CFR  
21 50. But there are wide variations in applicants' --

22 MR. CHOKSHI: Yes.

23 MEMBER SKILLMAN: -- healthy use of CAP.  
24 Some are very, very effective. Some licensees are  
25 very effective; some are not as effective.

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1           So, if CAP is going to be the carrier to  
2           make sure things get done, then where I am going with  
3           my questions is, how do you know that is going to  
4           happen? Because this is a very key issue from  
5           Fukushima and for our industry in this country. How  
6           do you know CAP is going to carry it for you?

7           MEMBER BLEY: I would like to back that up  
8           with just one thing, though. A couple of the events,  
9           operational events that happened in the last two or  
10          three years, were heavily linked to problems that were  
11          existing in the plant, either because identified  
12          problems were not entered into the CAP or that things  
13          were allowed to sit there for a long time without  
14          being resolved. Exactly the same kind of point I  
15          think that Dick is making.

16          MR. CHOKSHI: Yes. I think I would like  
17          Jim to answer the question. But before, I think one  
18          of the important things, the TI we talked about  
19          earlier, and doing the simultaneous walkdown together  
20          with when the licencees are conducting walkdown, part  
21          of this should be to follow up how the thing is  
22          getting to the CAP and what actions the licensees are  
23          taking.

24          MEMBER BLEY: As part of the inspection?

25          MR. CHOKSHI: As a part of the inspection.

1 MEMBER BLEY: And part of the TI?

2 MR. CHOKSHI: Right. Yes.

3 MR. ISOM: This is Jim Isom again.

4 The results from TI-183, if they were  
5 found, deficiency and nonconformance, is they were  
6 placed in the licensee's CAP program. In some cases,  
7 we went back and verified that the equipment was  
8 restored to working condition.

9 CHAIR SCHULTZ: One thing they get into  
10 here -- go ahead.

11 MEMBER RAY: Let me just add, I think we  
12 are continuing to mix up deficiencies, meaning  
13 something that doesn't conform with the design basis,  
14 with improvements or enhancements to address  
15 vulnerabilities and lots of other things. You don't  
16 put the latter in your Corrective Action Program.

17 MR. COOK: Right.

18 MEMBER RAY: And we have got to keep these  
19 straight or we are going to just get balled-up.

20 MR. CHOKSHI: Good point.

21 MEMBER SKILLMAN: Well, wait a minute.

22 Let me respond to that. I am not talking about a 25-  
23 cent fix-it item here. I am looking at slide 4, where  
24 this gentleman has said, you find this stuff; you put  
25 it in CAP. My belief is it is probably very

1 significant, and I am not sure CAP has the muscle to  
2 get it fixed. And that is my point, Harold.

3 MEMBER RAY: As long as it is related to  
4 the design basis, fine. It could be very significant,  
5 but related to an enhancement or a vulnerability that  
6 you are trying to address such as through IPEEE, in  
7 which case it wouldn't go, not in my case anyway --

8 MEMBER SKILLMAN: Not in mine, either.

9 MEMBER RAY: -- in a CAP program.

10 MEMBER SKILLMAN: No. You're right.

11 MEMBER RAY: And so, it is an enhancement.  
12 It is something that you do. But corrective action,  
13 as you, yourself, said, is related to Appendix B and  
14 compliance with the design basis.

15 MEMBER SKILLMAN: Yes.

16 MS. KAMMERER: I can't speak to what is in  
17 the -- I am not really sure what is in the flooding  
18 guidance, but in the seismic guidance we, as part of  
19 the documentation that comes to us, all the issues  
20 that are identified, the table of issues that are  
21 identified specifically provide information on how  
22 they were resolved, whether it is putting them into  
23 the CAP or verifying that they are consistent with the  
24 licensing basis. And so, we will have that  
25 information as to current status at that point of all

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1 of the degraded, nonconforming, or unanalyzed  
2 conditions stand.

3 It is our intention, as you heard, we are  
4 still in the process of developing of a TI on -- well,  
5 not "we"; my colleagues are developing the TI on  
6 seismic. And it is our intention to request them to  
7 follow up all of those items specifically, so that  
8 they do get the full attention of the inspectors to  
9 assure that things don't sit too long, to assure that  
10 they have a proper inspection review.

11 MR. CHOKSHI: Let me try to answer the  
12 question a little bit. You know, one thing is we are  
13 going to have a TI which is walking through it, but we  
14 also are going to get this information for our review.  
15 So, we will conduct the review after we get the  
16 walkdown reports.

17 Depending on what we find, for example,  
18 there may be something which may not be an issue with  
19 the current licensing basis, but it is an  
20 announcement. We think it is very critical or  
21 important. Then, we have to use our processes to make  
22 sure that, if you decide as a part of that  
23 information, review of the information, that we need  
24 to follow up on that, then we will have to use the  
25 other processes we have to implement those things.

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1           So, I think there is an impact. We are in  
2           the process of developing review plans and review  
3           guidance. All this sort of goes hand-in-hand, and it  
4           is very quick in terms of we are trying to put all of  
5           this scheme together.

6           MR. COOK: And what Annie said for the  
7           seismic is true for the flooding; the deficiencies are  
8           going to be reported back to us. We are going to  
9           know.

10           And also remember, this is done under a  
11           50.54(f) letter with a request for information. So,  
12           we will be getting that information back. And then,  
13           the NRC will be able to decide what it needs to do  
14           about it at that point in time. But we will have the  
15           report. The report will be there on the docket for  
16           public review.

17           CHAIR SCHULTZ: So, Christopher, in  
18           sticking with the licensing-basis aspect of this, not  
19           enhancements, when you say the information will come  
20           back from the licensees, that it has been entered into  
21           the Corrective Action Program, you also are expecting  
22           that you are going to see what was found, what is to  
23           be done, and on what time schedule that action will be  
24           completed from the licensees? In other words, you are  
25           looking for details associated with the entries into



1 the Corrective Action Program and you will review  
2 those?

3 MS. KAMMERER: As they are known at the  
4 time.

5 MR. COOK: Yes, and I believe that is  
6 spelled out in the report, yes, exactly. So, the  
7 details of what we want are spelled out in the report.  
8 Also, there is an appendix in the walkdown guidance  
9 that amplifies that. And I think I have some slides  
10 that talk about the walkdown report at the end of this  
11 that get into that. So, maybe we can see if that  
12 answers --

13 CHAIR SCHULTZ: And then, that will be  
14 reviewed here --

15 MR. COOK: Yes.

16 CHAIR SCHULTZ: -- as well as through the  
17 TI process?

18 MR. COOK: Oh, yes. Yes.

19 CHAIR SCHULTZ: Thank you.

20 MR. COOK: There are two different things.  
21 There is going to be the TI and the inspector report,  
22 but, then, there is also going to be the report at the  
23 end of the 50.54(f) letter that is there that is  
24 coming back to us. And that is the report that you  
25 will see laid out that I talk about later, is the

1 report from that 50.54(f) request for information.

2 CHAIR SCHULTZ: Thank you.

3 MR. COOK: Sure.

4 The last thing that I wanted to mention as  
5 far as a lesson from the past, too, was also some  
6 insights from Ft. Calhoun. There was some flooding in  
7 the June-to-August timeframe that went on. One of the  
8 things that happened there is they had site inundation  
9 for a very long period of time. It was approximately  
10 84 days.

11 Myself and a few other members of the  
12 walkdown team went out to Ft. Calhoun. We actually  
13 met with the Senior Resident, spent a couple of days  
14 walking down, trying to get information about that,  
15 because we wanted to make sure we learned from that  
16 particular event any lessons that were there that were  
17 appropriate.

18 And one of the things that is there, in  
19 addition to some of the points that you will see later  
20 on, was the duration of the event, the 84 days that  
21 were there, and what you need to do when you are  
22 talking about inundation for that long a period of  
23 time.

24 So, you will see where that is picked up  
25 and talked about, where we talk about flood duration,

1       how that is captured, finding out what the licensees  
2       have currently in their current licensing basis for  
3       the duration, so that we know that information that is  
4       there. And so that we can, then, look at that  
5       information and decide if we need to take any  
6       additional actions.

7                   MR. CHOKSHI: Please, before you go to the  
8       next slide --

9                   MR. COOK: Sure.

10                  MR. CHOKSHI: -- one important point I  
11       forgot to mention. The way we have been working on  
12       these issues, 2.1 and 2.3, flooding and seismic, we  
13       have a set of internal interoffice teams. So, we have  
14       people, for example, we have like a 2.3 flooding  
15       walkdown team, 2.3 seismic walkdown team. And that  
16       includes the inspection experts, people who have flood  
17       hazard expertise about the flooding, the people who  
18       are very familiar with flood protection, you know,  
19       people who are there, per Guide 1.102. And so, it is  
20       a team effort.

21                  From the questions, you are asking these  
22       broad perspectives, you know. For example, questions  
23       of, what is currently licensing bases, and our expert  
24       people are the most -- you know, so we have those  
25       people and our own people have the hazard expertise in

1 the new reactor and the inspection.

2 So, I just wanted to acknowledge that what  
3 you see is the product of a team. Okay? There is a  
4 flooding team and the seismic team. And then, the  
5 flooding team is headed by Chris and Peter Chaput from  
6 NRO and the seismic team by Dr. Kammerer and R. Cliff  
7 Munson. So, we have about 8-10 people from the  
8 different offices. I just wanted to give you -- so,  
9 this is sort of a group effort. Okay?

10 CHAIR SCHULTZ: And that group effort is  
11 continuing through the process?

12 MR. CHOKSHI: Throughout the process.

13 CHAIR SCHULTZ: Thank you.

14 MR. COOK: Correct. Exactly. And so,  
15 definitely you see me up here, but there is a whole  
16 team of people from NRR/NRO, Research, Region 4,  
17 Region 1. So, I mean, it is a large group of people  
18 that have been there, have been involved in our  
19 meetings, have been involved in reviewing the guidance  
20 that is there, and then adding their own comments and  
21 contributions to this. So, it has been quite an  
22 effort.

23 MEMBER SIEBER: Dr. Cook?

24 MR. COOK: Yes?

25 MEMBER SIEBER: I would like to ask a

1 general question about Ft. Calhoun.

2 MR. COOK: Sure.

3 MEMBER SIEBER: Did that event call into  
4 question the design basis for the adequacy of  
5 maintaining what design basis was there? It seemed to  
6 me that the flood was pretty high for the design of  
7 that plant. Is that the case?

8 MR. COOK: The current licensing-basis  
9 flood level was higher than the levels that were  
10 reached there.

11 MEMBER SIEBER: Okay. So, these were  
12 deficiencies in maintaining --

13 MR. COOK: There were a number of actions.  
14 Yes, there are a number of actions that have been  
15 ongoing at the site and at Ft. Calhoun and are  
16 continuing to ongo. There is a restart effort. The  
17 plant is not up. And so, there is a whole restart  
18 effort.

19 MEMBER SIEBER: Right. Okay. I can  
20 research that outside this Committee, but I am curious  
21 as to see how a situation like that, whichever way it  
22 was, would fit into your program here.

23 MR. CHOKSHI: Yes, we are trying to  
24 coordinate with the regions and NRR. On the cases  
25 like this where there are ongoing actions taking

1 place, we are coordinating with the regional people --

2 MEMBER SIEBER: Okay.

3 MR. CHOKSHI: -- and the NRR to make sure  
4 that it is consistent; we are using the information  
5 across the offices.

6 MEMBER SIEBER: Right.

7 MR. COOK: Exactly. So, yes, and we have  
8 been working quite a bit with Region 4 on this.

9 MR. CHOKSHI: There are a couple of places  
10 where there is a unique situation, you know.

11 MEMBER SIEBER: Yes, and I would think  
12 that the seismic area would be more difficult to do  
13 from the inspector's point of view than the flooding.

14 MS. KAMMERER: It is going to be  
15 challenging. One of the things that we would actually  
16 like to do is, as you will see, training is going to  
17 be required for the walkdown engineers. And so, one  
18 of the things that we are pursuing is videotaping the  
19 training and do a facilitated retraining here in-house  
20 for the inspectors, so that they see the same  
21 information and get the same training as those who are  
22 conducting the walkdowns.

23 MEMBER SIEBER: That is something I would  
24 like to look into at some future date, because I think  
25 that is a key.

1 MS. KAMMERER: Yes, we agree.

2 MEMBER SIEBER: There was a bunch of  
3 seismic walkdowns that took place in 1979.

4 MS. KAMMERER: Right.

5 MEMBER SIEBER: And the outcome was  
6 dependent on the skill of the inspector.

7 MS. KAMMERER: Right.

8 MEMBER SIEBER: And so, I think that that  
9 is a very important aspect of this whole process.

10 MR. CHOKSHI: Yes.

11 MS. KAMMERER: Yes, agreed.

12 MR. COOK: Okay. Next slide, please, Ed.

13 So, this brings us to the present day and  
14 the NEI guidance document. We had our last meeting,  
15 public meeting, on this document last week. NEI then  
16 took the weekend and Monday to do the final  
17 formatting, and it was submitted yesterday.

18 The outline of the document you see before  
19 you: introduction, purpose, definition, scope, and so  
20 on.

21 Bring your attention to the appendix.  
22 There are some examples for inspection considerations  
23 are there. We had had some earlier discussion about,  
24 is there going to be a checklist? There is, in fact,  
25 a walkdown record sheet that is there that is going to

1 be used onsite that goes through, that lays out these  
2 different things.

3 And you are going to see a lot of my  
4 discussion is going to be on the definitions, so  
5 explaining some of the terms that are there. And  
6 then, these are all items that are, then, captured and  
7 put into the walkdown record sheet that is there.

8 There is discussion of training, the  
9 training content, what it is going to cover there, in  
10 Appendix C. And then, Appendix D talks about the  
11 walkdown report to NRC. This is the 50.54 response,  
12 and amplifying what was in the 50.54(f) letter, which  
13 was a list of different things. It takes each one of  
14 those different items that is there and then amplifies  
15 underneath it the components that are really there,  
16 based on, well, one, the fact that we have additional  
17 space to amplify on it and, second of all, input from  
18 the entire team about what was intended behind those  
19 words that are on the 50.54(f) letter.

20 Next slide.

21 Some overarching considerations with this.  
22 I think we have already touched on this. But the  
23 purpose of this is that the licensees are going to be  
24 verifying that the following -- you will see the list  
25 here -- are going to perform their design functions,



1 again, as credited in their CLB, which is the current  
2 licensing basis.

3 So, one of the unique things, I think,  
4 about this is that not only are we talking about the  
5 permanent structure systems or components -- I may be  
6 calling those SSCs later on -- but we are also talking  
7 about the temporary and portable flood protection  
8 equipment that is there. Because, oftentimes, a lot  
9 of the flood protection equipment is temporary, and it  
10 needs to be installed before the event, which means  
11 that you have to have notification ahead of time that  
12 the event is coming. You have to be looking, then, at  
13 the aggregate actions of the staff, or the plant  
14 personnel -- excuse me -- the plant personnel that are  
15 there to put all that equipment together. You have to  
16 make sure that your supplies are together. So, that  
17 all comes into the temporary flood mitigation  
18 equipment.

19 The other things, then, are the procedures  
20 that are necessary to install and to operate the flood  
21 mitigation equipment that is there because some of the  
22 flood mitigation equipment is passive, like a door;  
23 other ones are active, like a pump. The active ones  
24 are going to require consumables or power. How is  
25 that going to happen, looking at those details.

1           So, with the flooding, you get into all  
2           these different tendrils. And so, that is put in  
3           there. So, I just wanted to mention that. You will  
4           see where I get on that a little bit more later.

5           MEMBER SIEBER: Do you require  
6           surveillance tests on active temporary flood  
7           protection equipment?

8           MR. COOK: We are going to be seeing,  
9           first of all, if there is active surveillance going  
10          in. And if there are not, then there are additional  
11          things that we can do.

12          MEMBER SIEBER: If you are going to run  
13          it, you don't know whether it is going to run or not.

14          MR. COOK: Function or not, correct. And  
15          that is part of it, is seeing if it is in the  
16          surveillance program.

17          MEMBER SIEBER: Yes.

18          MR. COOK: That is one of the things that  
19          is there, yes or no on the checklist. And then, if  
20          not, why not? Does it need to go into CAP? Those are  
21          all questions that are part of the form, just to get  
22          at that.

23          MEMBER SIEBER: Good.

24          CHAIR SCHULTZ: And these are the types of  
25          areas that you referred to earlier where previous

1 evaluations may have been optimistic in their reviews?

2 MR. COOK: Exactly.

3 CHAIR SCHULTZ: Temporary portable flood  
4 equipment?

5 MR. COOK: Temporary equipment, how high  
6 up were the sandbags stacked, other things there.  
7 Were procedures reviewed or was it just the equipment  
8 that was reviewed in the previous walkdowns that was  
9 there? This does both.

10 CHAIR SCHULTZ: And whether warning times  
11 would be adequate --

12 MR. COOK: Adequate.

13 CHAIR SCHULTZ: -- and sufficient to allow  
14 the actions to be taken in time?

15 MR. COOK: I think we are new to really  
16 talking about the duration of the event as well as the  
17 aggregate effects on the plant personnel that are  
18 there to do this, especially at multi-unit sites and  
19 in advance warning. So, all of those myriad of  
20 factors sort of come into this.

21 You were saying that seismic is  
22 complicated. I would also argue that the flooding is  
23 complicated -- (laughter) -- and sort of an aspect  
24 that is in there that has all these different tendrils  
25 that come in that you have to do.

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1 MEMBER SIEBER: Well, there is a lot to  
2 sneak past.

3 (Laughter.)

4 MS. KAMMERER: Yes, yes.

5 MEMBER SIEBER: You would not consider  
6 sandbags as any kind of a long-term fix for anything,  
7 right?

8 MR. COOK: Correct.

9 MEMBER SIEBER: For example, you would  
10 want permanent dikes if you found out that the  
11 probable maximum flood was higher than the original  
12 design basis?

13 MR. COOK: Well, except our guidance right  
14 now has temporary protection is allowed.

15 MEMBER SIEBER: How do you deal with a dam  
16 rupture? I mean, you don't have the time.

17 (Laughter.)

18 MR. COOK: Well, it depends on where it  
19 is, yes.

20 MEMBER SIEBER: The ones that I have  
21 looked at --

22 MR. COOK: Yes.

23 MEMBER SIEBER: -- in rivers --

24 MR. COOK: Sure.

25 MEMBER SIEBER: -- they come pretty fast.

1 MR. COOK: And that is taken into account,  
2 and that is one of the things that we are going to be  
3 doing in the hazard reevaluation, is looking at that.

4 MEMBER SIEBER: Okay.

5 MR. COOK: So, the upstream dam failures,  
6 using sort of a teaser for Recommendation 2.1, but as  
7 we get into that, we are going to be looking at  
8 reevaluating the hazard using the present-day  
9 methodologies and guidance that we do to the ESPs and  
10 COL.

11 So, looking at the upstream dam failure,  
12 if it were to occur, how much time do you have,  
13 depending on the distance and the time of travel that  
14 would be factored into it.

15 MEMBER SIEBER: That's right.

16 MR. COOK: And then, seeing, yes, do you  
17 have warning or, no, you have not, what you would  
18 have.

19 MEMBER SIEBER: Well, you are probably  
20 going to have warning. The question is, do you have  
21 enough time to do the --

22 MR. COOK: Exactly. What could you do?  
23 What could you hope to accomplish in that amount of  
24 time?

25 MEMBER SIEBER: Right.

1 MR. CHOKSHI: And one of the things is to  
2 look into this walkdown is the question of the timing.  
3 What are the flood-causing mechanisms that you can  
4 implement your procedures?

5 MEMBER SIEBER: Right. And you may not  
6 flood the plant, but if you have buried fuel tanks or  
7 something like that, you may have a problem.

8 MR. CHOKSHI: Right.

9 MR. COOK: Or if it gets up to site grade,  
10 but you don't actually flood into a building because  
11 you have flood protection, but you need to access it,  
12 do you have time to get the scaffolding and other  
13 things in place, so you can walk into?

14 MEMBER SIEBER: Right.

15 MR. COOK: That was down in Ft. Calhoun.

16 MEMBER SIEBER: And do you have access for  
17 long-term transfer of personnel?

18 MR. COOK: Exactly. Exactly. And how is  
19 that accomplished and what do you do with that?

20 MEMBER SIEBER: Right. Okay.

21 MEMBER SKILLMAN: You have spoken of  
22 procedures several times. Let me expand that.

23 MR. COOK: Sure.

24 MEMBER SKILLMAN: Talk just a little bit.

25 MR. COOK: Yes.

1                   MEMBER SKILLMAN: If you were to go into  
2 the emergency procedures --

3                   MR. COOK: Correct.

4                   MEMBER SKILLMAN: -- and review the EALs  
5 and find that the EALs trigger an unusual event or an  
6 alert --

7                   MR. COOK: Right, right.

8                   MEMBER SKILLMAN: -- or a site at a  
9 certain water level, to what extent will your effort  
10 reach out and touch the offsite responders? For  
11 instance, some plants don't have their own fire  
12 departments; they depend on offsite for it.

13                   So, here you have eight inches of water;  
14 you can't get across the bridge. You have got a fire,  
15 and that fire truck, it is on the other side of a dip  
16 in the road. It can't come across because the dip is  
17 16-feet deep. You have got no response.

18                   To what extent have you perhaps looked out  
19 beyond the site itself to where the tentacles of the  
20 EALs or the emergency response requires offsite, so  
21 that the plant is safe?

22                   MR. COOK: If that is being credited and  
23 they have those EALs, and we are going to see action  
24 levels that are there where they need to do certain  
25 things, or in the walkdown guidance, the NEI guidance

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1       that is there that we are going to be even going out  
2       and confirming is that they have notification  
3       methodology that is in place. Do they have a  
4       Memorandum of Understanding or agreement in place?  
5       Have they checked those call numbers? What is the  
6       periodicity that they are going to be doing those  
7       things? So, those tentacles are all being checked in  
8       this to see if they are proper, if they are in place.  
9       Do they have the names? Do they know how to get to  
10      them? So, that is covered in the walkdown guidance,  
11      is to reach out into that.

12               MR. CHOKSHI: But, to make sure, it is  
13      looked at from response -- that is a part of their  
14      fire protection procedures.

15               MR. COOK: Yes.

16               MR. CHOKSHI: It is not as an emergency  
17      response side of the question.

18               MR. COOK: But if they are crediting that  
19      they have a certain amount of time before this would  
20      happen, if a dam were to fail, that they would be  
21      notified or that they are going to be having water  
22      levels that are there, that they are going to be  
23      responding to notification, how does that notification  
24      take place? Do they have an MOU or MOA in place to  
25      actually make sure that happens? Do they have names



1 and numbers actually there and a process to follow if  
2 that were to happen?

3 MEMBER SKILLMAN: Thank you.

4 MR. COOK: Yes. Okay.

5 MEMBER SIEBER: It is a good question.

6 MR. COOK: Yes, it is; I agree. And it  
7 was one that is key to what we are doing.

8 Okay. So, this is what they are going to  
9 be looking at. The licensees are also going to be  
10 verifying. One of the things that was important to  
11 what we are doing, looking that the changes in the  
12 plant did not adversely affect flow.

13 As you all know, there were, following  
14 9/11, there were numerous security barrier  
15 installations that were, then, put into place. Since  
16 the plants were licensed, there have been topography  
17 changes, everything from warehouses to ISFSIs, to the  
18 you name it, has been put in.

19 How does that affect their site drainage?  
20 One of the things, if you look back at our history and  
21 some of the things that happened, is that site  
22 drainage needs -- you know, there are certain plans  
23 that have been put in place for that. When you have  
24 locally-intense precipitation falling on the site,  
25 changes to the topography can affect that. And have

1 they looked at that? Have they gone through? Have  
2 they done that re-analysis. So, that is one of the  
3 things that they are going to be verifying.

4 The other thing is the execution of  
5 procedures that will not be impeded by the adverse  
6 weather conditions. That was actually something that  
7 the ACRS recommended back to us, I think back in one  
8 of the letters that you had, was to make sure that we  
9 consider the adverse weather conditions that were  
10 there, so we can do that. So, we heard that and we  
11 have put that into place and have that in several  
12 spots throughout the guidance.

13 Okay. So, in order to understand the  
14 walkdown guidance, I thought it would be good to spend  
15 some time talking about the definition of terms that  
16 we have in there. So, you explain sort of how we have  
17 organized things, what we have put together.

18 For this guidance and the NEI's guidance,  
19 a deficiency exists when a flood-protection feature is  
20 unable to perform its intended flood protection  
21 function when subject to a design-basis flooding  
22 aspect. That is the definition that we have used.

23 So, again, this is repeating what we have  
24 already talked about, the observations that may  
25 result. Anything that may result in a potential

1 deficiency is then going to be put in and evaluated in  
2 accordance with the station processes and into the CAP  
3 program.

4 So, the walkdowns are going to go out.  
5 There is going to be a judgment that is going to be  
6 made that there is a potential. And any observation  
7 that says, okay, there is a potential for this to be  
8 a deficiency is going to be put into the CAP, and then  
9 it is going to be evaluated using the existing station  
10 processes. That is sort of the mechanistic process  
11 that is going to be taking place.

12 Once it gets evaluated, in the CAP -- this  
13 is what Annie was alluding to. So, observations that  
14 are determined by the CAP to actually be deficiencies  
15 that are there are reported back to the NRC in the  
16 walkdown report that is there.

17 Okay. Next slide.

18 Flood-protection features. This is sort  
19 of the term that gets at both the incorporated  
20 exterior and temporary structures, systems and  
21 components. So, all the different classes that are  
22 there, as well as the applicable procedures that are  
23 credited to protect against or mitigate the effects of  
24 the current licensing-basis external flood.

25 The terms "incorporated," "exterior," and

1 "temporary," this all follows from Reg Guide 1.102.  
2 This is the NRC's Reg Guide on flood-protection  
3 measures, and it uses and defines these terms. So, we  
4 have kept with this. In sort of more modern parlance,  
5 you have more things like active protection measures  
6 or passive.

7 We are following the Reg Guide. So, we  
8 are following the Reg Guide. We are keeping up with  
9 that, but, then, you will see things like an exterior  
10 active or an exterior passive, the whole idea being  
11 that active systems are there that are active; they  
12 are actually moving. You know, you have pumps, you  
13 have valves, you have level switches, or passive ones,  
14 dikes, berms, sumps, drains, and things that are  
15 passive; they don't have an active function.

16 So, normally, in hydrology we talk about  
17 active features and passive. Reg Guide 1.102 talks  
18 about the incorporated exterior, temporary. So, we  
19 have sort of those classifications, and you will see  
20 all that put out together in the NEI guidance that is  
21 there, that it puts together, keeping with the Reg  
22 Guide.

23 MEMBER SKILLMAN: What is the last update  
24 of that Reg Guide?

25 MR. COOK: 1977? I would have to get back

1 to you.

2 MEMBER SHACK: '76.

3 MR. COOK: '76?

4 (Laughter.)

5 Okay. Thank you.

6 MEMBER SKILLMAN: Has anything happened  
7 since 1976 that might make you want to change the Reg  
8 Guide?

9 MR. COOK: Yes. Actually, that is ongoing  
10 right now in Research. In Research right now, one of  
11 the people that is on our flood walkdown team -- do a  
12 plug for Research -- Jake Philip, Dr. Jake Philip, who  
13 is there is actually in charge of working on an update  
14 to the Regulatory Guide. As part of this, he actually  
15 went out with us to Ft. Calhoun that was there. So,  
16 he was part of our walkdown. We were looking at Ft.  
17 Calhoun to get those insights.

18 That document is right now undergoing  
19 review and updating. And hopefully, anything that we  
20 learn from this will, then, get incorporated into the  
21 final version of that when that gets released by the  
22 Office of Research.

23 MEMBER SKILLMAN: Okay. Thank you.

24 MR. COOK: Yes.

25 Okay. Next slide.

1           Okay. Regional assimilation. I had  
2 mentioned this earlier. This is where we are talking  
3 about walkthrough of a procedure or an activity to  
4 verify that the procedure or activity can actually be  
5 executed as written. This is something that was found  
6 out that is needed to do. We have been using the term  
7 "reasonable assimilation" to get at that.

8           And so, this is where we are going through  
9 and verifying that the plant staff resources are  
10 actually available, including the aggregate effects.  
11 So, if you have a multi-unit site, you have to look at  
12 the aggregate effects. If you have the amount of  
13 time, the other actions, you are making sure you don't  
14 double-count personnel. You have 200 people there,  
15 but all 195 are out doing something else, and you only  
16 have five people to do the sandbags. And you are  
17 crediting these sandbag operations, which is a very  
18 manual-labor-intensive issue. How are you doing that?  
19 How are you counting all those things? So, that is  
20 what this gets at.

21           Just looking at the credited time-  
22 dependence. So, making sure that these activities can  
23 be completed and the sequence that they have.

24           Equipment and tools, properly staged.  
25 Getting back into what we were talking about earlier

1 with the site conditions that are there. So,  
2 execution of the activity will not be impeded by the  
3 event.

4 If you think about most of these sites,  
5 they are not paved all the way around. A lot of  
6 equipment that is out there, it starts to rain. You  
7 get muddy, soft soils and then you need to be able to  
8 transport this heavy equipment into place and get it  
9 there. Are you going to have issues with that? Are  
10 you going to have trouble? How are you making sure  
11 that you can actually do what you are saying that you  
12 are going to do and get it there with the conditions  
13 that exist?

14 It is also going to be looking at how the  
15 weather conditions, the adverse weather conditions,  
16 can impede the activities. Again, from a letter from  
17 ACRS, but also in Blayais this was an important thing.  
18 They had a procedure where they actually had, you  
19 know, in France, to go out there to turn a particular  
20 valve. With the winds that were there, it was almost  
21 impossible for them to do.

22 So, did the manual operator actions that  
23 are credited for take into account the weather  
24 conditions that could be expected to simultaneously  
25 occur? That is what this is getting at and that

1 verification. And then, also, making sure that the  
2 training is provided for the activity.

3 MEMBER SIEBER: Do you require that you  
4 have facilities to house and feed extra numbers of  
5 people that you would need to respond to a long-term  
6 incident? For example, I know of one plant that could  
7 keep an additional 60 people there and feed them from  
8 onsite resources without any contact to the offsite.  
9 I think that is important.

10 MR. COOK: Okay. We are looking at the  
11 staff that are there. And so, we have that mentioned  
12 in there. So, that is a good comment.

13 MEMBER SKILLMAN: Let me build on that.  
14 I know the site -- excuse me.

15 MR. COOK: Jim Riley is from NEI. He is  
16 the lead for the guidance.

17 MR. RILEY: Thanks, Chris.

18 I would suggest that that consideration is  
19 a valid one, but it is an emergency planning issue.  
20 I think it is kind of outside the scope of this  
21 flooding-protection thing. I don't want us to get too  
22 far into that. That is their realm.

23 MEMBER SIEBER: Yes, in the instances with  
24 which I am familiar, it was part of the emergency  
25 plan.



1 MR. RILEY: I didn't hear you. I'm sorry.

2 MEMBER SIEBER: I said, in the instances  
3 with which I am familiar, it was incorporated, all the  
4 procedures and facilities, as part of the emergency  
5 plan.

6 MR. RILEY: Yes, I agree. We talked in  
7 our last meeting, Chris, that there are some of the  
8 things that we are developing as part of this guidance  
9 and as part of the information we are collecting that  
10 really we need to be communicating to those who are  
11 responsible for the emergency plan because it is good  
12 input to that. You know, issues on reasonable  
13 simulation and how many does it take to do this, how  
14 much time does it take to get it done, that kind of  
15 thing, and we will be making sure we have got some  
16 coordination with those people.

17 MR. CHOKSHI: Yes, you know, particularly  
18 the Recommendation 9.3 --

19 MR. COOK: Exactly.

20 MR. CHOKSHI: -- which in this is  
21 responding, I think this is very good feedback to that  
22 question of staffing.

23 MR. COOK: And as Jim was saying, that  
24 actually did come up in our meetings, that there is an  
25 obvious nexus and overlap between those two, looking

1 at that and feeding in. And so, some of our questions  
2 will dovetail in.

3 MEMBER SIEBER: I think a lot of plants  
4 have those kinds of facilities, particularly in the  
5 emergency planning area, because a full-blown  
6 emergency plan event, even a simulation, is a long-  
7 term deal. It is not an eight-hour deal.

8 MR. COOK: Right.

9 MEMBER SIEBER: And I think it is  
10 important to withstand some of these natural  
11 phenomenon that might occur also because of  
12 inaccessibility, difficulty in getting around, and so  
13 forth.

14 MR. COOK: Exactly.

15 CHAIR SCHULTZ: Christopher, for clarity  
16 here in terms of the lingo, the language, walkthrough  
17 can be taken as that? In other words, where we are  
18 talking about the simulation, we are not talking about  
19 a tabletop review? We are talking about something  
20 that would be a walkthrough of the expectations  
21 associated with the facility and the personnel?

22 MR. COOK: It is going through and it is  
23 looking to see what would be there. There are  
24 questions that are asked. Has this ever been done  
25 before? Has this been there, yes or no? If it hasn't

1       been done, then that would be captured and put in  
2       there. If it has been done, can you take credit for  
3       what has been done? How did it go? So, that is part  
4       of it.

5               But there is definitely a paper part of  
6       this to look at it, to see what has been done and what  
7       can be credited, and to look at the numbers that are  
8       there. It isn't actually saying that we are going to  
9       go out and simulate the full thing that would take  
10      place there, just because of its disruption and, also,  
11      the amount of time. In order to get this walkdown  
12      report to us in November, it really wasn't practical  
13      to say, okay, you are going to simulate all these just  
14      for this.

15             CHAIR SCHULTZ: Right. Understood.

16             MR. COOK: So, I wanted to make sure it  
17      was clear that there is going to be a significant  
18      paper review of this, but that paper review isn't  
19      going to be looking at those logistics and also  
20      telling us whether or not it has been done, simulated  
21      or not.

22             CHAIR SCHULTZ: Good. Thank you.

23             MEMBER STETKAR: Chris, I didn't see any  
24      mention of this, and it is probably because of the  
25      agency's fragmented approach to external events. And

1 that was a calculated statement.

2 (Laughter.)

3 There is a NUREG that was written called  
4 NUREG-1852, demonstrating the feasibility and  
5 reliability of operator manual actions in response to  
6 fire that has a lot of useful guidance in terms of, I  
7 think, performing this type of evaluation. It looks  
8 at timelines. It looks at the availability of  
9 procedures. It looks at kind of a walkthrough of the  
10 process using realistic estimates of how much time is  
11 available, how much time is required with margins.

12 And it would strike me that that type of  
13 evaluation and going through that process, documenting  
14 that type of process, would be quite useful for this,  
15 since they are analogous, obviously.

16 MR. COOK: Yes. No, they are. No, that  
17 is good.

18 MEMBER STETKAR: So, I would encourage  
19 you, if you haven't, to take a look at that because  
20 there is a lot of useful information in there. And,  
21 in fact, the industry is familiar with it because they  
22 are using it in the fire area these days.

23 MR. COOK: Well, and we have employed it  
24 in other things with the fire. I mean, that  
25 particular one we haven't.

1 MEMBER STETKAR: Yes.

2 MR. COOK: But particularly with the seals  
3 and looking at the seals that we have been doing --

4 MEMBER STETKAR: Yes, yes.

5 MR. COOK: -- a lot of that, and the way  
6 that we are attacking that --

7 MEMBER STETKAR: So, there is a lot of  
8 overlap. But in this area, in particular, because I  
9 think you are hearing a little bit of consternation  
10 about what is the level of detail of this reasonable  
11 simulation exercise --

12 MR. COOK: Yes.

13 MEMBER STETKAR: -- there might be some  
14 useful stuff in there.

15 MR. COOK: Okay.

16 MEMBER SKILLMAN: Chris, I would like to  
17 focus on the two, the next-to-the-last and the one  
18 before the bullets there.

19 MR. COOK: Okay.

20 MEMBER SKILLMAN: To what extent has the  
21 temperature of the event played into your thinking?  
22 I would submit to you that dealing with flooding  
23 conditions in June, July, and August would present one  
24 set of conditions --

25 MR. COOK: Yes.

1                   MEMBER SKILLMAN:  -- that are very, very  
2                   different than dealing with flooding conditions in  
3                   December, January, and February, at least at 40  
4                   degrees north.

5                   MR. COOK:  Sure.

6                   MEMBER SKILLMAN:  In one case, you are  
7                   dealing with water that you can likely wade in safely;  
8                   in another condition, you are dealing with  
9                   hypothermia.  You are dealing with water that is  
10                  probably 34 to 32 degrees Fahrenheit.  You may have  
11                  frazil ice and you may have ice, in which case you  
12                  really can't spend much time paddling around in that  
13                  water.

14                  MR. COOK:  Correct.

15                  MEMBER SKILLMAN:  So, to what extent in  
16                  reasonable simulation have you considered temperature  
17                  of the event?

18                  MR. COOK:  I think you are getting at the  
19                  challenge to document all the different components  
20                  that go into the flooding and the wide range of  
21                  expertise, the wide range of considerations that are  
22                  in there.  We stated -- I keep on saying "we" -- NEI's  
23                  guidance states that you are supposed to consider the  
24                  difference adverse weather conditions that are there  
25                  and to look at that and to consider that when you look

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1 at the reasonableness of the measures that take place.

2 And I would fully assume that weather  
3 conditions, both cold and hot -- because with the hot  
4 well, I mean, if you are talking about a place and if  
5 you are trying to implement sandbags when it is 110  
6 degrees outside with high humidity, it is also a  
7 definite challenge.

8 MEMBER SKILLMAN: For sure.

9 MR. COOK: So, both the hot and the cold  
10 are really a definite challenge to the personnel and  
11 how you accomplish that needs to be part of this. And  
12 so, I think that was written in at a high level, and  
13 we will need to be going through and verifying. But  
14 the weather conditions definitely take a toll.

15 MR. CHOKSHI: Yes, I think that is very  
16 useful input.

17 MR. COOK: It is.

18 MR. CHOKSHI: And we will need to go back  
19 and make sure that that is clear. When we talk about  
20 adverse weather conditions, we are talking about nine  
21 different elements.

22 MEMBER SKILLMAN: Okay. Thank you.

23 MR. COOK: And that is in there. I mean,  
24 we talk about all those different components that are  
25 in there right now, in the guidance. We also talk

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1 about things like hail, lightning, those other  
2 components that are there during the heart of the  
3 storm.

4 You know, some of these things, you are  
5 going to deal with it differently. Ft. Calhoun was  
6 unique because it was 84 days. And so, sometimes  
7 before I think in a lot of thinking, it was like, oh,  
8 you are going to have a quick event and then it is  
9 going to be gone. In other ones, that is the where  
10 the duration comes in that is so important. If you  
11 are having an extended one, you have to deal with it  
12 differently perhaps than one that would come in, you  
13 know, something like a hurricane that would come in in  
14 a matter of days.

15 MEMBER SKILLMAN: Thank you.

16 MR. COOK: Yes. Okay.

17 Next slide, please.

18 Visual inspection. I put this up here to  
19 tee-off the other ones that are there. So, visual  
20 inspection is sort of what you expect it would be. It  
21 is a visual inspection of the physical condition of an  
22 SSC.

23 I put this up here because there are three  
24 categories that are possible when we are talking about  
25 equipment or items that are actually there. And I



1 have the next bullet, which says, "In limited  
2 situations where a flood feature cannot be visually-  
3 inspected, it, then, has to be categorized into either  
4 restricted-access or inaccessible areas." And you  
5 will see the next two slides get in there. But I put  
6 this up here because it is one of the three categories  
7 that something is going to be put into. And there is  
8 a clear preference, once you read the other ones, for  
9 putting things in visual because that is what we  
10 wanted to do.

11 Next slide.

12 So, restricted access. Restricted-access  
13 areas are areas that are not normally accessible for  
14 direct visual comparison. Items that are classified  
15 in this need to be put in and told in the response to  
16 us in the 50.54(f) letter. We will know which ones  
17 are put into restricted access.

18 They also have to, then, give us a  
19 justification for delaying this, along with a schedule  
20 for when it is going to be accomplished. So, this is  
21 something that you would get to, but you just can't  
22 right now. So, this is ones where you are going to  
23 have hazard to personnel. It is a high-radiation area  
24 that is there, or toxic gas may be present. You don't  
25 want to do that right then. You have got to wait.

1 You have got to schedule it.

2 The same thing with risk to plant  
3 operations, if you have trip-sensitive equipment in a  
4 box, you want to wait until the appropriate time to  
5 get in there before you look at it to inspect it. The  
6 same thing with difficulty of access, you know,  
7 erecting scaffolding, doing everything with the  
8 schedule that we put in place, they may have to delay  
9 that for another time in order to make sure that that  
10 gets put in place. But they have to report back to us  
11 what those are and the schedule for when that is going  
12 to take place.

13 MEMBER SIEBER: I presume security issues  
14 are not one of the restricted-access prohibitions,  
15 right? Because you can always escort people.

16 MR. COOK: Yes. No, I mean, because  
17 really we put a pretty high bar on these two --

18 MEMBER SIEBER: Okay.

19 MR. COOK: -- on restricted access and  
20 when you look at inaccessible areas.

21 MEMBER SIEBER: Right.

22 MR. COOK: So, that wasn't. It wasn't  
23 really restricted is a delay. There shouldn't be a  
24 delay just to get a security guard in there.

25 MEMBER SIEBER: Okay.

1 MR. COOK: That is going to have to show  
2 up in the response letter.

3 MEMBER SIEBER: I think excess radiation  
4 would be perhaps the only one that could legitimately  
5 keep people out for long periods of time.

6 MR. COOK: Yes, but this category is  
7 really one that may actually get into inaccessible  
8 areas where, really, this would be high rad for a  
9 temporary period of time where things are buttoned-up.  
10 And then, once it opens up and you are doing an  
11 outage, then you can get in there and do it.

12 MEMBER SIEBER: Right.

13 MR. COOK: That is sort of more the  
14 thought between restricted --

15 MEMBER SIEBER: That's fine.

16 MR. COOK: And then, the other category --  
17 next slide, please, Ed -- is inaccessible. So, the  
18 inaccessible areas are ones where you can't reasonably  
19 be inspected. That is there because of the  
20 significant personnel hazard. This is the very high  
21 radiation hazards that would be there. And there is  
22 no reasonable means of getting in.

23 But we don't just stop there. First of  
24 all, they have to, then, tell us in this letter why is  
25 it inaccessible that is in there and list it in the

1 50.54(f) response letter.

2 And the other thing is they have to give  
3 us a justification as to why they think that this  
4 flood feature is available and it is going to be  
5 performing its intended function. They have to  
6 justify that for us.

7 That is going in; it is looking at other  
8 plant records. We were talking about going in with  
9 the fire. Do they have other similar ones that were  
10 installed that they can do? Do they rely on as-built  
11 drawings? Or did they actually go in and pull tags to  
12 say that, okay, we have this put in; we have the  
13 records for the installation that were, then, put in  
14 place? So, they have to give us that justification  
15 that is there as to why they think it is going to  
16 perform, and not just perform, but it has to perform  
17 for the full duration of the flood condition.

18 They also have in the guidance talk about,  
19 you know, if they can't make that justification, then  
20 they have to assume and look at the potential loss of  
21 function. And then, they have to evaluate what the  
22 loss of function would be. So, that is the other  
23 alternative. Okay. It is inaccessible.

24 All right. So, those are the three  
25 different areas: visual, restricted access,

1 inaccessible.

2 Okay. Next slide.

3 So, now we are getting into a variety of  
4 site conditions. This is important. Again, one of  
5 the lessons that we learned from Japan in Fukushima,  
6 there we had an earthquake. We, then, had the  
7 reactors trip. And then, about 40 minutes later, we  
8 had the tsunami event that came through, and the  
9 reactors were tripped at that time. They weren't in  
10 full-power mode.

11 So, the other things that we have put into  
12 this is we are talking about look at the variety of  
13 site conditions considered in your current licensing  
14 basis, looking at the different modes of operation  
15 that are there. Because this is one of the key things  
16 that we learned, was that, unfortunately, things can  
17 still happen, even when you are not in full-power  
18 mode. And so, look at that. Tell us how you are  
19 protecting against flood outside of just your full-  
20 power mode.

21 I mention adverse weather conditions  
22 because, again, it gets into this broad class where we  
23 are talking about the variety of conditions that are  
24 there. And so, the walkdowns will verify that all the  
25 flood-protection features and procedures are

1 available, functional, and implementable under the  
2 variety of site conditions as assumed in the current  
3 licensing basis.

4 MEMBER RAY: Well, the current licensing  
5 basis doesn't, for most plants, anyway, that I know,  
6 include all modes for every event.

7 MR. COOK: Some have temporary procedures  
8 that they will put in place, and they will get  
9 reported back to us. If they have those, they will  
10 tell us. If they don't, then they tell us what they  
11 do and they don't have.

12 MEMBER RAY: I am talking about the  
13 current licensing basis. It is a fact, is it not,  
14 that they don't include all modes for all events?  
15 Okay?

16 So, let's say you don't have a procedure  
17 that deals with a particular event in a shutdown mode  
18 of some kind. Is this meant to cause you to prepare  
19 such a procedure?

20 MR. COOK: No, it is meant to report back  
21 to us for our information --

22 MEMBER RAY: Okay. That's fine.

23 MR. COOK: -- about what modes they are  
24 currently protected for and which ones they have  
25 procedures for.

1 MEMBER RAY: That just wasn't clear in  
2 what you said. That is my point.

3 MR. COOK: No. No, exactly. So, this  
4 is --

5 MEMBER RAY: The implication is that  
6 either the design addresses all events in all modes or  
7 there are procedures that do so. And that is not  
8 true. So, if we are just looking for information,  
9 then that should be clear.

10 MR. COOK: Yes, and that is it. That is  
11 for this 50.54(f) letter, that is a request for  
12 information to get that information --

13 MEMBER RAY: Right.

14 MR. COOK: -- so we can find out and we  
15 can know exactly what modes they have and have that,  
16 because that is something that need to know.

17 MEMBER RAY: That's fine. It was just the  
18 way you said it made it sound like, well --

19 MR. COOK: I apologize.

20 MEMBER RAY: -- you would have procedures  
21 if you were in a different mode, and that is part of  
22 the case --

23 MR. CHOKSHI: I think that point is very  
24 well-taken because that was a lot of discussion. You  
25 know, what do we mean by this? Because exactly what

1       you said --

2                   MEMBER RAY:   Right.

3                   MR. CHOKSHI:   -- not all plants have or  
4       may not need even --

5                   MR. COOK:   Correct.   Correct.

6                   MEMBER RAY:   Well, let's not go into  
7       licensing history here.   But the point is that it  
8       would be a rare case where you had a licensing basis  
9       for all events in all modes.   That would just be  
10      remarkable.

11                  MR. COOK:   Thank you, Dr. Ray.   No, the  
12      point here was just to consider what you have in your  
13      current licensing basis and to tell us what --

14                  MEMBER RAY:   Good enough.   That is fine.

15                  MEMBER SKILLMAN:   Let me pick on your  
16      second bullet there for a second.   Let me keep  
17      expanding this topic and going after weather  
18      conditions.

19                  MR. COOK:   Sure.

20                  MEMBER SKILLMAN:   I know of a handful of  
21      plants that have experienced threshold flooding with  
22      icing.

23                  MR. COOK:   Uh-hum.

24                  MEMBER SKILLMAN:   So, if you can think of  
25      your flood as six inches of ice or four inches of ice

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1 on the road, you now have a different kind of flood.  
2 It is a solid-water flood, and it is extremely  
3 dangerous. It brings the whole region to a halt.

4 MR. COOK: Right.

5 MEMBER SKILLMAN: To what extent has icing  
6 been considered as part of this adverse weather  
7 conditions?

8 MR. COOK: In our reviews, especially  
9 mostly from my experience, in the new reactor reviews  
10 it is considered. And so, getting into 2.1 for the  
11 reevaluated design basis, it will consider ice and ice  
12 effects, frazil ice, icing that is there, making sure  
13 that you can get the safety-related water.

14 This is looking at, as you would have in  
15 those procedures, have you accounted for those  
16 conditions that, then, would take place to make sure  
17 that you can actually implement them and do them? So,  
18 in the 2.3, it is more looking at trying to see what  
19 conditions you have considered, that you are  
20 considering now, and to report back to us what you  
21 have considered.

22 MEMBER SKILLMAN: And this will be in CAP?

23 MR. COOK: If there is a deficiency, if  
24 there is a deficiency that is found. But the report  
25 will be in there regardless of what they consider.

1 MEMBER SKILLMAN: Okay. Thank you.

2 MR. COOK: Okay. Next slide.

3 Flood duration. I think we have already  
4 covered this quite a bit. But, again, it gets at the  
5 length of time in which the flood conditions exist  
6 and, again, telling us what was assumed in your  
7 current licensing basis. So, the walkdowns and the  
8 effects should also consider the entire flood duration  
9 that is there, site and building access, travel around  
10 the site, equipment operating times, supplies and  
11 consumables.

12 Okay. Next slide.

13 So, now we are getting into cliff-edge  
14 effects.

15 Any questions?

16 (No response.)

17 All right. So, cliff-edge effects, this  
18 was defined by the Near-Term Task Force Report which  
19 noted that the safety consequences -- and I underline  
20 the word "safety" consequences -- of a flooding event  
21 may increase sharply with a small increase in the  
22 flooding level. This was a definition that was there  
23 in the Near-Term Task Force Report, and I quoted the  
24 page numbers that were there.

25 When we wrote the 50.54(f) letter, we used

1 the same terms that were there in the letters, where  
2 we are getting at the cliff-edge effects. As we have  
3 gone through this process, as we have talked about  
4 what we are looking at and what we expect to do, our  
5 thoughts have matured, and we are now getting into  
6 differentiating and looking at the effects versus more  
7 of the physical measurements.

8 So, the next slide.

9 So, staff are now differentiating between  
10 cliff-edge effects, which we are hoping and we want  
11 and we will deal with in Recommendation 2.1 that are  
12 getting into the consequences, and a new term that we  
13 are calling the available physical margin. The  
14 available physical margin for each flood-protection  
15 feature is the difference between the licensing-basis  
16 flood height that is there and the flood height at  
17 which water could, then, impact an SSC that is  
18 important to safety, the safety feature that is there.

19 So, you might hear me call it APM. It  
20 stands for available physical margin. We coined a new  
21 term.

22 So, the available physical margin is  
23 determined by measurement. This is a measurement that  
24 is there that is appropriate for a walkdown and it has  
25 a resultant value of length. And this is different

1       than cliff-edge effects, which is determined by  
2       analysis, as it starts looking at, okay, what is taken  
3       out; what is there; what is your effect? Do you have  
4       other redundant systems that are there? And then,  
5       trying to look at the safety consequences that take  
6       place.

7                     Okay. Next slide.

8                     MEMBER RAY: But wait.

9                     MEMBER ARMIJO: So, that would be like --  
10       oh, go ahead. I'm sorry.

11                    MEMBER RAY: No, that's all right.

12                    Well, you made a distinction there, and I  
13       was trying to figure out what the distinction was.  
14       You said the knife-edge was determined based on  
15       analysis; whereas, this is based, APM is based on --  
16       and then, it sort of trailed off, and I couldn't  
17       figure out what you were saying.

18                    MEMBER ARMIJO: I think I got it and I  
19       think like it. If you have an inlet to an emergency  
20       diesel generator and it meets a design-basis flood  
21       with one foot of margin, it would be nice to know that  
22       it is only one foot of margin. When you do your  
23       hazards reevaluation, you find that that margin is  
24       consumed by a new hazard. Then, at least you have  
25       pointed out where a weakness is in that initial

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1 walkdown.

2 MEMBER RAY: But isn't that margin just a  
3 margin to a knife-edge effect? That is what I was  
4 trying to understand. How is it different?

5 MR. COOK: Well, it is margin to flooding  
6 of one particular safety function.

7 MEMBER RAY: Yes. Understood.

8 MR. COOK: Would you, then, have a  
9 redundant one?

10 MEMBER RAY: Yes.

11 MR. COOK: Would you have a redundant one,  
12 then, at a different location that you could then use  
13 and bring into play that would be in a different  
14 location that is higher up?

15 MEMBER BLEY: So, it is not a cliff-edge  
16 for overall damage?

17 MR. COOK: Correct.

18 MEMBER BLEY: It is a cliff-edge for local  
19 damage.

20 MR. COOK: Which is the different effects  
21 that you are going to get into to look at all the  
22 effects on the plant.

23 MEMBER RAY: Well, then, APM is related to  
24 the function, not the particular piece of equipment?  
25 Is that what you --

1 MR. CHOKSHI: Well, the APM is, for  
2 example, if you have two diesel trains, okay --

3 MEMBER RAY: Yes.

4 MR. CHOKSHI: -- two AC power --

5 MEMBER RAY: Right.

6 MR. CHOKSHI: -- but one has a margin, a  
7 very small margin, but the other one, for some reason,  
8 has a much greater margin, then, we would not call  
9 that an APM. But if you lose the water for the  
10 function of the diesel, then it would be considered  
11 for these purposes an APM, and it could be reported as  
12 such, or we record it as such.

13 I think as, Dennis, you mentioned, the 2.1  
14 integrated assessment will look at the total effect.  
15 You know, how can I respond to a flood event?

16 MEMBER STETKAR: So, Nileshe, if I can use  
17 words that I am more familiar with, you are now  
18 incorporating the term "cliff-edge effect" as the  
19 consequence of a flooding event that exceeds that  
20 margin?

21 MR. CHOKSHI: And if you look at the Near-  
22 term Task Force language, exactly, that is what they  
23 implied as the consequences.

24 MEMBER STETKAR: Thank you.

25 MEMBER SKILLMAN: Let me ask this: in

1 some plants, probably the most vulnerable SSC is in  
2 the basement. It could be a diesel. You had a plant  
3 that is on the Great Lakes. Would the flooding height  
4 be a calculated flooding height based on in-leakage  
5 rate, an area, to threaten that component? In other  
6 words, would the flooding height be a calculated  
7 value?

8 MR. COOK: The flooding height, in the  
9 basement of a building, typically, with these  
10 buildings you would have multiple ways that water  
11 could get in.

12 MEMBER SKILLMAN: Uh-hum.

13 MR. COOK: So, this is getting at, well,  
14 how would the water get in? So, you could have cable  
15 boxes or you could have cable --

16 MEMBER SKILLMAN: French doors?

17 MR. COOK: Exactly.

18 MEMBER SKILLMAN: Roll-up doors, all kinds  
19 of things.

20 MR. COOK: Each one of those will, then,  
21 be looked at. And each one of those will, then, be  
22 looked at, how they are protected. So, maybe you have  
23 a seal, and that seal is rated to 20 feet static head,  
24 you know, that would be there.

25 And then, you look at its elevation and

1 you look to see where the licensing-basis elevation is  
2 going to come up to.

3 MEMBER SKILLMAN: Okay.

4 MR. COOK: That difference would give you  
5 your margin. So, if that seal is rated for 25 feet,  
6 if the licensing basis is up to 20 feet, you would  
7 then have five feet of margin that would be on there.  
8 Of course, if it is negative, that would be, then, a  
9 deficiency.

10 But this is getting at what is that  
11 additional value. And then, you look at those things.  
12 You have the doors. You would have all these  
13 different components that could come in that, then,  
14 have the potential of flooding. You are checking each  
15 one of those to make sure, to see how much margin you  
16 actually have on these. And this is what is getting  
17 in --

18 MR. CHOKSHI: You also have some examples,  
19 right?

20 MR. COOK: Yes, I have some examples that  
21 are coming up, some pictures that might help with  
22 this.

23 MEMBER SKILLMAN: Okay. Thank you. Thank  
24 you.

25 MEMBER BLEY: I think your available



1 physical margin would be exceedingly clear to everyone  
2 if it didn't have mixed in this discussion about  
3 cliff-edge effects, which are ill-defined. And if the  
4 definition you gave us is somehow become the staff  
5 definition, you guys ought to go back and think about  
6 that as a whole staff. I mean, it is a concept that  
7 is, at this point, it confuses the issue more than  
8 helps it.

9 MEMBER RAY: I still don't understand it,  
10 but I am not going to --

11 MR. COOK: The second bullet?

12 MEMBER RAY: No.

13 MEMBER SKILLMAN: In time, it is going to  
14 take on the same definition, or the impact is safety-  
15 related.

16 MEMBER BLEY: Well, 1 and 3 both make this  
17 comparison. When you get to this comparison with an  
18 ill-defined concept like cliff-edge effect, it  
19 confuses the hell out of all of us.

20 MR. COOK: Dr. Bley, I guess the main  
21 thing would be bullet two, which is what we are  
22 getting at.

23 MEMBER BLEY: But that seems pretty clear.

24 MR. COOK: That is the one.

25 MEMBER BLEY: If you are not befuddled by

1 bullet two.

2 (Laughter.)

3 I really am suggesting that not just you,  
4 but the whole staff rethink this thing and define it  
5 very clearly.

6 MR. CHOKSHI: You are absolutely right.  
7 I mean, the discussions we have had with industry on  
8 this issue have been quite lengthy.

9 MR. COOK: Yes.

10 MR. CHOKSHI: And again, because of this,  
11 you know, what do you mean by this?

12 MEMBER BLEY: Rather than instilling this  
13 into the architecture because it has evolved that way,  
14 if it can be rethought and come up with something very  
15 clear and concise that everybody could understand, we  
16 would all be well-served.

17 MR. COOK: Agreed. Agreed. And that is  
18 sort of our plan between now and November. What we  
19 are getting into is we are going to be starting to  
20 develop the guidance for what we call the integrated  
21 assessment for flooding.

22 MEMBER BLEY: Okay.

23 MR. COOK: And that is where we are going  
24 to be getting in, using this --

25 MEMBER BLEY: But this term crosses every

1 boundary. So, it not just in the area you are working  
2 on.

3 MR. COOK: Sure, sure, exactly.

4 CHAIR SCHULTZ: Christopher, let's go  
5 through your example and see how that plays forward.

6 MR. COOK: Okay. Very good. Thank you.  
7 Especially aware of the time.

8 Next slide, please.

9 So, the APM values are going to be  
10 collected during both the visual inspection as well as  
11 the reasonable simulation, because you have a number  
12 of things that are going to be simulated. Sandbags,  
13 for example, would be one of them. And you would be  
14 looking at the margin that is there with those.

15 So, all of the APMs with a small margin  
16 that could result in a loss of safety function are  
17 planned to be entered into the CAP. And the  
18 information on the APM is going to retained onsite and  
19 available for inspection and for audit.

20 MEMBER ARMIJO: Well, Chris, I kind of  
21 don't understand why, if they are meeting their design  
22 basis, even though they have small margin, why would  
23 it go into CAP? Isn't that something you would hold  
24 aside for the future, once you get a new hazard  
25 evaluation and you find out that that margin really

1 isn't enough?

2 MR. COOK: I think that there was an  
3 interest on the part of industry in this to put this  
4 in here and to look at this, because we are talking  
5 about something that does have small margin, that does  
6 lead to potential loss of safety function.

7 But you, also, then, need to look at the  
8 severity of the hazard that goes with it. You need to  
9 put that hazard in context as you look at it.

10 And so, those three things. So, I think  
11 the proposal that was here with NEI was to do this,  
12 was to put it in. Ones that would have small margin  
13 that would result in a loss of safety function would  
14 be put into the CAP and then evaluated further.

15 MR. CHOKSHI: It is a checking mechanism.  
16 So, we are using that as a vehicle --

17 MEMBER ARMIJO: But it doesn't indicate  
18 there is a deficiency.

19 MR. CHOKSHI: No. No. Right. No, you  
20 are right.

21 MR. WIDMAYER: I think part of what you  
22 are thinking is that it enters into the methodology  
23 for CAP. It doesn't necessarily result in a  
24 corrective action, but it will be evaluated.

25 MEMBER ARMIJO: Okay.

1 MR. CHOKSHI: Yes.

2 MR. COOK: Thank you, Derek.

3 Yes, exactly.

4 I included some slides that were there.  
5 Hopefully, they help to explain.

6 So, this is an example of a flood barrier  
7 door that you see on the right. It weighs about 200  
8 pounds. It can be lifted up and it will be, then,  
9 placed to guard against these doors. So, this  
10 temporary floodgate guards the entrance to a Safety  
11 Category 1 structure that would be there.

12 They need to maintain access, personnel  
13 access, into and outside of this door. So, that is  
14 why this floodgate does not cover the entire door. It  
15 only covers part of it.

16 And so, this is just one particular  
17 example of the way that certain flood protection  
18 measures are actually implemented at the site, where  
19 this would be, then, picked up and slid in on the  
20 righthand side. I mean, you can see where I put in  
21 the red line, where the top of the floodgate comes up  
22 into --

23 MEMBER BLEY: You have got to run this  
24 past me again.

25 (Laughter.)

1                   MEMBER STETKAR: Let me try something  
2 first. Those doors open out. If the water is out  
3 there, how are they going to open up the door with all  
4 of that water?

5                   MR. COOK: The door would already be open.  
6 The door would already be open and there would be  
7 water on the other side of that barrier that is there.

8                   MEMBER STETKAR: Ah, okay.

9                   MEMBER BLEY: So, you have to open the  
10 doors?

11                  MR. COOK: Yes.

12                  MEMBER STETKAR: You have to open the  
13 doors first?

14                  MR. COOK: The doors have to be open  
15 first. That barrier gets put in place. There is a  
16 rubber seal that actually goes around it with a nipple  
17 attachment that is there that hooks up to an air  
18 compressor that inflates that rubber bladder. This is  
19 just to give you an idea of what a flood door looks  
20 like that is actually there in a plant that they are  
21 looking at and walking down, give you an idea of the  
22 range of expertise that is needed, too.

23                  MEMBER BLEY: So, this isn't just a tight  
24 fit? If you lose air, then you lose your seals?

25                  MR. COOK: You could. I mean, this is how

1 it is protected. And so, this is the entrance to a  
2 Category 1 safety structure that is there, and this is  
3 put in place.

4 And the whole concept with APM is that you  
5 are going to have a current licensing-basis flood  
6 value that comes up to a certain height along that  
7 door that is going to be less than the height of that  
8 door. So, that basis could be one foot; it also could  
9 be, because of their current licensing basis and the  
10 way that we do things now, that the current licensing-  
11 basis flood height could be exactly at the top of this  
12 door, or floodgate. I keep on calling it a door, but  
13 it is a floodgate. So, I want to make sure my  
14 terminology is correct. On top of the gate.

15 So, on top of the gate, it could be right  
16 up there. In that case, the APM would then be zero.  
17 But that would, then, be allowed under the current  
18 licensing basis because it is exactly meets their  
19 licensing basis.

20 MEMBER BLEY: I know that this will make  
21 my colleague, Mr. Ray, stand up. But I am not  
22 advocating. I am remembering after the Virginia  
23 earthquake and the Commission meeting on this people  
24 were explaining it. It is something that I think  
25 everybody knew, but nobody talked about much, which

1 was the way the design-basis earthquake is set up, and  
2 the sort of statistics that are behind it, mean that  
3 there is about an 86 percent chance that you won't  
4 exceed it if you have an earthquake and a 14 percent  
5 chance that you will. We are building a door or we  
6 have already built a door up to the maximum probable  
7 flood.

8 What is the probability, if you have a  
9 flood that exceeds the maximum probable flood?

10 MR. COOK: Right now, the probable maximum  
11 flood is deterministic.

12 MEMBER BLEY: What is the probability that  
13 if you have a flood it exceeds the maximum flood  
14 probability?

15 (Laughter.)

16 MR. COOK: I don't know. I mean, they are  
17 storms never to be exceeded. That is the way that  
18 we --

19 MEMBER RAY: No, no, no, no. No, not  
20 never; don't say "never".

21 MR. COOK: Well, hardly ever.

22 MEMBER RAY: Deterministic licensing  
23 basis, you don't say "never".

24 MR. COOK: Yes, but that is the concept.

25 MEMBER RAY: No, it isn't.



1 MR. COOK: Well, okay.

2 MEMBER RAY: It isn't. Maximum credible,  
3 all kinds of words you can use, but you never say  
4 "never".

5 (Laughter.)

6 MR. COOK: Yes.

7 MR. CHOKSHI: It was more a historical  
8 perspective with some additional margin.

9 MEMBER RAY: Well, yes, but most of the  
10 plants were built in history, and that is what we are  
11 talking about.

12 MEMBER BLEY: And the new plants are being  
13 built now where there is the probability of exceeding  
14 the --

15 MEMBER RAY: That is not what we are  
16 talking about here, but, nevertheless --

17 MEMBER BLEY: That is what I am talking  
18 about.

19 MEMBER RAY: Okay. That's fine.

20 MEMBER SHACK: Presumably, we will address  
21 that in 2.1.

22 MS. KAMMERER: Exactly.

23 MR. COOK: One would think so.

24 MR. CHOKSHI: But I think we are coming to  
25 the Committee and going to talk about the whole

1 probabilistic hazard analysis very soon.

2 CHAIR SCHULTZ: There is another  
3 opportunity then.

4 MR. COOK: Just another example that I  
5 thought I would put in here. This is just an example  
6 of cable penetrations. Again, these are other things  
7 that we have found out through historical perspective  
8 need to be looked at, both in the U.S. as well as  
9 abroad.

10 So, this is an example of where you have  
11 cables that are running. This is outside of a reactor  
12 building that is here.

13 And you have the different cable raceways  
14 that then go along. You can see those conduits. Some  
15 of those would, then, lead downhill to an intake  
16 structure, where they enter below ground.

17 If the water level for some reason would  
18 come up above the top of those holes there, then these  
19 cable conduits sort of act like pipes. And so, the  
20 water can actually flow down through.

21 And so, it is important to check, then,  
22 the penetrations and, also, the ratings that is there,  
23 the static head on these, to make sure that they meet  
24 what they were designed to.

25 So, okay. Training and qualifications.

1 The personnel selected to perform the walkdowns and  
2 inspection activities must be experienced and  
3 knowledgeable. I think, as you can see from our  
4 discussion today, there is a broad range of knowledge  
5 and expertise that is necessary to do this and to  
6 conduct these.

7 It was a distinct challenge for us to  
8 figure out how to word these so that we had confidence  
9 that the people doing this would be experienced and  
10 knowledgeable in what they are doing and what they  
11 need to perform.

12 As you can see, there are people that need  
13 to be knowledgeable with the current licensing basis.  
14 They need to be knowledgeable of the flood-protection  
15 features. They need to be knowledgeable of  
16 operations. They also need to know the procedures  
17 that would be in there. And so, you can think of  
18 everything from levees to sandbagged walls, the  
19 procedures to put in those sandbagged walls, the  
20 seals, and everything else.

21 So, what we have required is, where  
22 specific knowledge is necessary to inspect a flood-  
23 protection feature or procedure, one member of the  
24 team must have the ability to determine if the  
25 condition of the feature or procedure needs to be

1 entered into the CAP. So, that is the determination  
2 that we need to be able to do to get that in there.  
3 So, any walkdown observation that cannot be  
4 immediately judged as acceptable must be put into the  
5 CAP, then, for disposition.

6 Next slide.

7 So, then, the training qualifications, the  
8 training requirements for each section of the walkdown  
9 guidance form are provided in NEI's document. I list  
10 the section numbers there.

11 Training modules are being developed by  
12 INPO right now, so that people can have the training  
13 to be knowledgeable when they go out there and do  
14 this.

15 The responsibility, it is the  
16 responsibility of each licensee to document how the  
17 assigned individuals then meet all the experience and  
18 knowledge requirements that are there, requiring that  
19 there be signatures on the walkdown record sheet to  
20 document the individuals that are performing the  
21 inspections, and the inspection sheets are going to be  
22 retained onsite and available for audit. The walkdown  
23 record sheets are also going to be packaged together  
24 with a cover memo that is there that is going to  
25 undergo management review.

1           And ultimately, at the end, the walkdown  
2           effort is really going to be governed by, also, the  
3           utilities process that is there for responding to NRC  
4           requests under oath or affirmation. So, there is a  
5           pretty high bar associated with all this through  
6           there. And so, we have documented that and make sure  
7           that they have that.

8           As promised, the walkdown report, Appendix  
9           D of the guidance repeats and expands on each item  
10          that we had, then, in the 50.54(f) letter. The  
11          reported items include a description of the walkdown  
12          guidance, including any exceptions they took, team  
13          organization and training. It talks about the current  
14          licensing basis, the flood action levels that we were  
15          talking about, the credited warning time. It talks  
16          about the protection mitigation features, the variety  
17          of conditions. Any deficiencies, as determined by the  
18          CAP, will be put in here. And then, any actions taken  
19          or planned to address the deficiencies or to enhance  
20          protection.

21          As I mentioned earlier, the walkdown  
22          reports are due within 180 days following our  
23          endorsement of this guidance that we now have before  
24          us. So, as you can see, the clock is very soon to be  
25          starting on this.

1           Finally, I thought I would just conclude  
2           with informing 2.1. The walkdowns are, of course, to  
3           gather information in the interim period until  
4           Recommendation 2.1 is completed.

5           We are going to be learning a lot of very  
6           important things, I think, from this. We are asking  
7           them to verify the flood-protection features, both the  
8           SSCs as well as the procedures, a variety of site  
9           conditions that in their current licensing basis, and  
10          also the duration of the flood in their current  
11          licensing basis. So, we are going to be learning a  
12          number of things.

13          And so, then, if needed, during the  
14          Recommendation 2.1 integrated assessment, the term may  
15          or may not stay as it is, but this is where we are  
16          getting into the cliff-edge effects that we had talked  
17          about and the Near-Term Task Force talked about,  
18          looking at the safety risks that are going to be in  
19          there.

20          And finally, with the integrated  
21          assessment, if it is performed, we will use the APM as  
22          well as other information about the SSCs for subject  
23          to flooding and the potential mitigation, the ability  
24          to mitigate those systems.

25          Okay? So, with that, that is the end of

1 my slides on the flooding.

2 CHAIR SCHULTZ: Christopher, are you  
3 available in the next segment --

4 CHAIR SCHULTZ: We will be all here.

5 CHAIR SCHULTZ: -- where Annie is going to  
6 be discussing seismic?

7 MR. COOK: Oh, yes, I plan to stay up here  
8 after break.

9 CHAIR SCHULTZ: Wonderful. Thank you.

10 MR. CHOKSHI: We will all be here.

11 CHAIR SCHULTZ: As is the normal practice,  
12 the Committee has done a good job integrating comments  
13 and questions in the discussions that we have had this  
14 morning. The next session is, as I mentioned, Annie's  
15 discussion related to seismic, and Chris is going to  
16 be here for that.

17 Are there any comments or discussion that  
18 we would like to bring forward before we have a break?

19 MEMBER ARMIJO: I would like to say that  
20 I think the APM idea is something I had been looking  
21 for before. Because I had the feeling that we were  
22 going to wind up having two sets of walkdowns, one for  
23 the current licensing basis. Then, with a new hazard  
24 evaluation that defines new hazards, then doing it all  
25 over again.

1           In the course of doing the walkdown and  
2           using the APM idea, you can point out on a separate  
3           column these are things that we should worry about  
4           just in case the hazards, the new hazards turn out to  
5           be greater than what we used before. So, I think that  
6           is an excellent approach.

7           MR. COOK: Well, thank you very much for  
8           that, because that was somewhat intentional in that --

9           MEMBER ARMIJO: Yes.

10          MR. COOK: -- and going along and  
11          collecting that now. So, I appreciate that feedback.

12          MEMBER STETKAR: I think there still may  
13          be, just to follow that a bit quickly because we need  
14          a break, there may be a need for some reevaluation,  
15          something that Dick brought up quite a while ago. And  
16          that is, for example, although the APM measures a  
17          difference in elevation --

18          MR. COOK: Right.

19          MEMBER STETKAR: -- there are different  
20          ways of achieving that elevation.

21          MR. CHOKSHI: Right.

22          MEMBER STETKAR: And I am thinking about  
23          things like reevaluating dam failures or perhaps storm  
24          surges that had not been evaluated sufficiently  
25          before --



1 MR. COOK: True.

2 MR. CHOKSHI: Right.

3 MEMBER STETKAR: -- where you do have a  
4 dynamic loading effect that may not be evaluated  
5 simply by filling up a bucket under precipitation-  
6 type --

7 MR. COOK: You are correct. The  
8 hydrodynamic forces are one.

9 MEMBER STETKAR: Right, right.

10 MR. COOK: That is the one that we look  
11 at, is the hydrodynamic.

12 MEMBER STETKAR: And the APM gives you a  
13 margin for a static --

14 MR. COOK: Correct. Correct. That is it.

15 MEMBER STETKAR: -- but that is it.

16 MR. COOK: Good point.

17 MEMBER SIEBER: That is a good point.

18 MEMBER REMPE: The guidance -- oh, I am  
19 sorry, your hand was up.

20 The guidance documents that were reissued  
21 yesterday, I don't think we got a copy of them. Did  
22 you get a copy of them?

23 MR. WIDMAYER: I did, yes.

24 MEMBER REMPE: Okay. So, you will forward  
25 them to us?

1 MR. WIDMAYER: Yes.

2 MR. COOK: To Derek's credit, they did  
3 come in late. So, Dr. Rempe, we make sure that we get  
4 that to you.

5 MEMBER REMPE: That's fine. I just wanted  
6 to make sure --

7 MR. COOK: They were late.

8 MR. WIDMAYER: I made sure the Chairman  
9 had a copy, though; no one else.

10 (Laughter.)

11 MEMBER SKILLMAN: First of all, thank you.

12 MR. COOK: Oh, yes.

13 MEMBER SKILLMAN: Your dependence on CAP  
14 needs to be followed up by assuring that the  
15 licensee's CAP system is one that is worth trusting.  
16 Some licensees are really good at root-cause and fix,  
17 and others are not so good. So, if you are going to  
18 depend on CAP as heavily as you have communicated,  
19 please make sure the CAP system you are depending is  
20 really a good one.

21 The second thing, I urge you to really  
22 take a look at EALs. It is easy to say in flood you  
23 go into emergency procedures and that is a whole  
24 different deal than operating procedures. I will tell  
25 you from firsthand experience, when you reach out into

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1 the emergency procedures, all of a sudden, you are in  
2 a whole new world. And those emergency procedures,  
3 particularly for those that you are depending upon to  
4 support you, they have got to work. I mean they have  
5 got to function the way you anticipate that they will  
6 to achieve the functional outcome that you are  
7 anticipating.

8 And thirdly, temperature effects. I think  
9 flood in the summer -- and you are right on the money;  
10 imagine sandbagging at Palo Verde on the 4th of July.

11 (Laughter.)

12 I understand. But this temperature thing,  
13 particularly for plants in the north, where it can be  
14 icy and get cold, and often flooding accompanies the  
15 ice; ice causes the flooding actually.

16 Thank you.

17 CHAIR SCHULTZ: Any other comments?

18 (No response.)

19 With that, we will adjourn for a break and  
20 restart --

21 MEMBER ARMIJO: Recess.

22 CHAIR SCHULTZ: -- for a recess, restart  
23 at 10:35.

24 (Whereupon, the foregoing matter went off  
25 the record at 10:17 a.m. and went back on the record

1 at 10:35 a.m.)

2 CHAIR SCHULTZ: We will return from recess  
3 now and start the second portion of the discussion.

4 Dr. Kammerer will lead us in the  
5 discussion of seismic walkdown guidance.

6 MS. KAMMERER: Great. Thank you very  
7 much.

8 Well, let me start by saying that now this  
9 is something completely different. Of course, the  
10 flooding and the seismic are very different types of  
11 problems, and the walkdowns, as you will see, are very  
12 different.

13 Seismic walkdowns are extremely equipment-  
14 focused because we are looking at all the systems,  
15 which are themselves affected by the earthquake, and  
16 are also needed to bring the plant to safe shutdown.  
17 And so, what we are going to be looking at is a  
18 process where we take information that has been  
19 collected in the past -- of course, the plants have  
20 had in some case multiple seismic walkdowns before,  
21 sometimes for A46, all of which for IPEEE, which  
22 resulted in a lot of information, and sometimes for  
23 other purposes in between new PRAs and things like  
24 that.

25 And so, our challenge in developing this

1 seismic walkdown guidance is to determine how we could  
2 use information from the past along with an  
3 understanding that we are dealing with thousands of  
4 pieces of equipment and that, normally, to do a more  
5 traditional walkdown would take far in excess of the  
6 time that we have available. And so, we are looking  
7 at a way to use the information we have to do a smart-  
8 sampling approach and in a way that feeds into  
9 expansion of the equipment review, as needed, and,  
10 also, an approach called area walkbys, which then also  
11 expands the equipment that we are looking for.

12 So, let me go to the first slide.

13 Okay. So, as Chris mentioned, we have had  
14 a lot of interaction on this topic. We first were  
15 provided an outline on March 27th, and we have had  
16 eight public meetings start to finish that were  
17 specifically looking at the language of the walkdowns  
18 and we would take existing guidance that was focused  
19 on larger programs and take the best of it and apply  
20 it to this particular objective.

21 We had our final meeting yesterday in  
22 terms of the content of the guidance. We believe that  
23 we have a full agreement on all of the processes,  
24 procedures, and approaches, as well as having gone  
25 through word-by-word most of the chapters.

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1           Tomorrow we anticipate getting the final  
2           version submitted. It is going through a peer-review  
3           process with all the reviewers in the industry today.  
4           We will get that tomorrow.

5           And then, on Friday, what we are going to  
6           do is do a final word-by-word walkthrough of the  
7           document, going through any comments that we have, so  
8           that we can all finalize the document and feel  
9           comfortable that we know exactly what is going to be  
10          coming in and what we will be looking at accepting.

11          MEMBER RAY: Now is it also true, as it  
12          was in flooding, that we are looking for information?  
13          That is the purpose of this?

14          MS. KAMMERER: Yes, that is correct. It  
15          is very similar, in that this is an information  
16          request. You will see that we have two separate parts  
17          of information that we have requested. And like  
18          flooding, we are looking at design-basis verification  
19          and validation. We are also looking at any degraded,  
20          nonconforming, unanalyzed conditions that might have  
21          come up as a result of plant changes, plant  
22          modifications, and things that have happened since the  
23          plants were last walked down as part of the IPEEE.

24          Okay. So, this is basically the outline  
25          of the guidance content body, which is going to be

1 published as an EPRI report under the guidance of NEI.  
2 As you can see, there's a number of elements in the  
3 main body and, then, a number of appendices which  
4 provide additional specific guidance.

5 It starts out with an overview of the  
6 approach, reminding everyone of the objective and,  
7 also, detailing how all the pieces fit together.  
8 Because this isn't just a repeat of what has happened  
9 in the past, we have to start by getting everyone  
10 fully cognizant of all of the elements.

11 There is also a discussion of personnel  
12 qualifications, development of the safe shutdown  
13 equipment list, and the seismic walkdown equipment  
14 list, with one being a development of the full body of  
15 equipment that would be used as part of the safety  
16 functions. And then, the seismic walkdown equipment  
17 list is the subset of that, which we are starting with  
18 on those seismic walkdowns.

19 There is a discussion of how the seismic  
20 walkdowns and the area walkbys are to be conducted, a  
21 discussion of how the seismic licensing-basis  
22 evaluations are to be conducted when items of concern  
23 are identified, a peer-review discussion, and that has  
24 been an area of significant discussion between our  
25 groups.

1 IPEEE vulnerabilities addresses a specific  
2 request in the 50.54(f) letter which asks the  
3 licensees to provide information on what happened as  
4 a result of the IPEEE program and what of the  
5 vulnerabilities -- and we are using that term broadly  
6 -- were addressed previously when those were closed  
7 out; and then, a discussion of the submittal report.  
8 Basically, in terms of the submittal report, these  
9 items 1 through 7 are chapters in the submittal  
10 report, as well as all of the underlying checklists,  
11 tables of all the information.

12 MEMBER BLEY: Let me just ask you a  
13 procedural question.

14 MS. KAMMERER: Sure.

15 MEMBER BLEY: Earlier you said, "I am not  
16 sure what is in the flooding guide," which made me  
17 say, "Oooh, you guys are working on these, too. And  
18 as I look at the tables of contents, I see they are  
19 quite different. Is that intentional or it just came  
20 out because you guys can't look at what each other are  
21 doing? I am trying to make sense -- we are putting  
22 down guidance for all time; it would be nice to have  
23 them more parallel.

24 MS. KAMMERER: Well, they are really  
25 different programs and problems. Whereas, flooding is



1 very procedurally-oriented, has equipment that comes  
2 in on a temporary basis -- I should be fair to Chris  
3 because he did provide it to me, but I have literally  
4 been working seven days a week for six weeks trying to  
5 get this out. So, it has been more of a matter of  
6 having just this constant influx of my own.

7 MR. CHOKSHI: Well, to answer the  
8 question, I am sort of a common element. I am looking  
9 at both.

10 MEMBER BLEY: I was really asking you.

11 (Laughter.)

12 CHAIR SCHULTZ: Yes. No, I think there  
13 are several reasons why that this has evolved. But I  
14 think, as Annie said, to me, for the purposes for the  
15 program, and given the differences, you know, inherent  
16 differences in the way we look at flood protection  
17 versus seismic, given the history of seismic walkdown  
18 evolution, you know, the methodology exists. So, I am  
19 not surprised that they have gone on an divergent  
20 path.

21 But on the overall concept of what  
22 information requests, how we want to use it, those are  
23 the high-level common elements, but their objectives  
24 are both the same. Okay? And what actions we take --

25 MEMBER BLEY: Yes. I mean, the reason I

1 raised it is because you brought the seismic walkdowns  
2 for PRA --

3 CHAIR SCHULTZ: Yes.

4 MEMBER BLEY: -- which is where a lot of  
5 this started.

6 MR. CHOKSHI: Exactly.

7 MEMBER BLEY: But at least most of the  
8 licensees, when they have done this, they have done  
9 one walkdown to cover everything and used the same  
10 basic approach with experts from both sides coming on  
11 to get the individual detail. And it just feels funny  
12 to me to have them organized completely differently.  
13 I understand there is different technical content you  
14 are after on each point.

15 MR. CHOKSHI: Right. Yes.

16 MEMBER BLEY: But the going out, where you  
17 look, how you look, all of that part of it is a lot  
18 the same.

19 MR. CHOKSHI: Yes. The things that I  
20 think where we looked for commonality were the  
21 qualifications. Are we asking sort of the same level  
22 of qualifications in the two programs, you know,  
23 things like engineering degree and that sort of thing?  
24 Training, are we approaching the training, now the  
25 peer review -- I think we tried to sort of balance

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1 those aspects a little similar. But, again, I think  
2 given the different quirks, there are still some  
3 differences. But you are right, the structure looks  
4 very different.

5 MEMBER BLEY: Yes. I hope both of them  
6 have operators --

7 MR. CHOKSHI: Yes.

8 MEMBER BLEY: -- and those qualifications.

9 MR. COOK: Yes.

10 MEMBER RAY: Well, Nilesch, let me, though  
11 -- I know how much confusion exists when you mix  
12 licensing basis and IPEEE.

13 MR. CHOKSHI: Yes.

14 MEMBER RAY: All right? And I know the  
15 agency has tried at times to differentiate between the  
16 purpose and the methodology in IPEEE and current  
17 licensing-basis changes, amendments to the license.  
18 And yet, I find people confuse them. They think that,  
19 because they did a vulnerability assessment and they  
20 made a submittal, that they, in effect, changed their  
21 licensing basis when they did that.

22 Are you making that distinction really,  
23 really clear? Because if I were doing what Annie has  
24 had to do, I don't know how the heck I would mix IPEEE  
25 vulnerabilities and an assessment against the current

1       licensing basis.

2                   MS. KAMMERER: Well, that is why they are  
3 quite separate. The challenge is that that is what  
4 the 50.54(f) letter requests.

5                   MEMBER RAY: What is what it requests?

6                   MS. KAMMERER: The documentation of how  
7 the IPEEE vulnerabilities were disposed and what and  
8 when occurred in --

9                   MEMBER RAY: Yes, but when you do that,  
10 people think -- and, you know, I mean these are people  
11 who run plants; they are not part of the games that we  
12 play here -- they think they are describing to you a  
13 change they made back when they did their IPEEE  
14 submittal to their licensing basis. That is what they  
15 think.

16                   MS. KAMMERER: No. Well, that might be  
17 what they think, but we have a requirement to meet the  
18 request for information that we laid out in 50.54.

19                   MEMBER RAY: I know, but you reinforce by  
20 what you say sometimes. Other times, we say, "Oh, no,  
21 no, no. IPEEE was just looking at opportunities to  
22 reduce risk by addressing vulnerabilities. It wasn't  
23 anything that should be misconstrued as changing the  
24 licensing basis." And yet, I haven't --

25                   MR. CHOKSHI: I think your point is well-

1 taken, and that we had a lot of discussions with  
2 industry to make sure, you know, both sides, that  
3 people don't mix the two up.

4 MEMBER RAY: Well, the people you talk to  
5 are more like us than the people in the plant.

6 MR. CHOKSHI: That's true.

7 MEMBER RAY: The people in the plant think  
8 that "I did that before" and --

9 MS. KAMMERER: It should be very clear in  
10 the guidance.

11 MEMBER RAY: I hope it is.

12 MS. KAMMERER: And that is why the IPEEE  
13 vulnerabilities and the guidance to address that  
14 specific request is a completely separate chapter in  
15 how they do it and, also, a separate portion of the  
16 documentation to us.

17 MEMBER RAY: Okay. Well, that is the best  
18 you can do, I guess, but I just assure you that what  
19 we talk about here, and even in the public meetings  
20 that we have with the industry, is one thing. But  
21 what the people in the plant think we are asking them  
22 is a different question.

23 MR. CHOKSHI: But I think we have run into  
24 that same difficulty.

25 MS. KAMMERER: Right.

1 MR. CHOKSHI: Constantly, keeping these  
2 things separate is hard.

3 MEMBER RAY: It is. It is very hard, and  
4 it gets mixed up. Well, never mind.

5 MEMBER SKILLMAN: Annie, if I could ask  
6 this question, please?

7 MS. KAMMERER: Yes.

8 MEMBER SKILLMAN: In the approach that you  
9 have written or the description of the tasks that you  
10 have written, have you made clear that these reviews  
11 are against current licensing basis --

12 MS. KAMMERER: Yes.

13 MEMBER SKILLMAN: -- seismic motion?

14 MS. KAMMERER: Yes, it is very clear  
15 throughout, you know, first, in the overview, in the  
16 discussion. Also, in the way that the reviews in  
17 terms of things like anchorage are conducted, it is  
18 against the current licensing basis. In terms of how  
19 any potential issues that are identified in the  
20 walkdowns are disposed of by checking against the  
21 current licensing basis, and if that can't be done,  
22 then putting it into CAP, so that first step occurs  
23 specifically against the current licensing basis.

24 Also, I think it is important to  
25 understand that the way that these walkdowns are

1 conducted is different from the walkdowns which will  
2 be conducted later for 2.1 in that these aren't for  
3 fragility development or things that would go into,  
4 ultimately, the PRA as part of 2.1. It is  
5 specifically looking at the elements which were  
6 discussed in the 50.54(f) letter, which is degraded,  
7 nonconforming, unanalyzed conditions against the  
8 current licensing basis.

9 MEMBER SKILLMAN: Thank you. Thank you.

10 MS. KAMMERER: Okay. So, there is a  
11 number of appendices that are provided, acronyms,  
12 equipment classes which we will discuss in a little  
13 bit as part of the sampling approach. Checklists are  
14 provided, both a walkdown and a walkby checklist, as  
15 well as a peer-review checklist on the peer review for  
16 the safety system selection. Clearly, that is a very  
17 important element, making sure that we get a good  
18 sampling that is representative of the broader plant.

19 Description of seismic/spatial  
20 interactions, so that the seismic walkdown engineers  
21 have additional guidance as to what they are looking  
22 for.

23 Systems that support safety functions,  
24 this is just provided as background, so that when the  
25 safe shutdown equipment lists are developed that they

1 have something to sort of check against and see if  
2 what they are coming up with is reasonable.

3 A definition of terms used throughout the  
4 document.

5 And then, Appendix H provides a tie from  
6 the documentation requirements and the elements in the  
7 guidance specifically to the request of the 50.54(f)  
8 letter, so that there is a tie one-to-one, so that the  
9 licensees can have confidence and the staff can have  
10 confidence that what they are going to be submitting  
11 meets the request for information.

12 Okay. So, there is a number of personnel  
13 which are identified in the document. The equipment  
14 selection personnel will, of course, be going through  
15 the systems and identifying the broader safe shutdown  
16 equipment list, as well as developing the seismic  
17 walkdown equipment, which was a subset. We will talk  
18 about how all that occurs.

19 Plant operations personnel will be pulled  
20 in throughout the processes. And they will  
21 specifically be asked to sign off on the equipment  
22 list.

23 The licensing-basis reviewers are  
24 specifically looking at -- I will get to that in a  
25 second -- the licensing-basis reviewers are



1 specifically looking at taking the outcomes of the  
2 walkdowns and checking against the licensing basis.  
3 The IPEEE reviewers will be looking at that  
4 subsection, and they should be the ones that are  
5 familiar with that program. And then, the peer-review  
6 team. All of the ones that I just mentioned,  
7 those five, the qualifications are based on knowledge  
8 and experience in each of those areas.

9 The seismic walkdown engineers have  
10 additional training requirements. They start out with  
11 a degree in --

12 MEMBER STETKAR: Annie?

13 MS. KAMMERER: Yes?

14 MEMBER STETKAR: Look up for a second.

15 (Laughter.)

16 You were reading your slide.

17 MS. KAMMERER: Oh, yes.

18 MEMBER STETKAR: I wanted to kind of  
19 interrupt you before you got to the seismic walkdown  
20 engineers.

21 MS. KAMMERER: Yes.

22 MEMBER STETKAR: You mentioned plant  
23 operations personnel as being pulled in on an as-  
24 needed basis. Why aren't they integrally involved  
25 from the beginning of that, as a required part of both

1 the equipment selection team and the seismic walkdown  
2 team?

3 MS. KAMMERER: They are insofar as they  
4 have to sign off on the equipment selection.

5 MEMBER STETKAR: That is not what I asked.  
6 Why aren't they integrally involved with selection of  
7 the equipment and performance of the walkdowns, not an  
8 after-effect, after-the-fact signoff involved?

9 MEMBER BLEY: Your brain isn't in it the  
10 same way, signing off on a list as it is building the  
11 list.

12 MS. KAMMERER: Yes, yes. I mean, well, we  
13 had, actually, a lot of discussion about the  
14 operations personnel right from the beginning. One of  
15 the early tasks that I took in one of the early public  
16 meetings was to go and to look at how the operations  
17 personnel had been effectively brought in the IPEEE  
18 process. The No. 1 place that there seemed to be a  
19 lot of value is in equipment selection, and  
20 particularly in this case in terms of the subsection  
21 which is in the SWELs.

22 So, the idea is that they are involved in  
23 that as support staff.

24 MEMBER STETKAR: As I read the guidance,  
25 it says, if you need help, go out and ask these people

1 for help. Who makes that decision? If the guidance  
2 said, absolutely a requirement is that a member of the  
3 team must be a licensed plant operator, that is  
4 different. Because I might know everything that I  
5 need to know about civil structural engineering and I  
6 know how this equipment fails. I don't need the help  
7 of those operators. So, I never go ask for their  
8 help.

9 MS. KAMMERER: Well, except that you have  
10 to because they --

11 MEMBER STETKAR: No, it says, "as needed".

12 MS. KAMMERER: Okay.

13 MEMBER STETKAR: So, somebody needs to  
14 make the determination that I need their help; I need  
15 to actively go out and beg for their assistance. That  
16 is different than saying they shall be integrally  
17 involved from day one on the process.

18 MEMBER BLEY: And the products look very  
19 different.

20 MEMBER STETKAR: And the products look  
21 very different.

22 MS. KAMMERER: Okay. So, when we went  
23 through the discussions with industry, the place that  
24 we came to in the middle was that we required that the  
25 plant operations personnel went through enough of the

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1 process that they were comfortable. We didn't get to  
2 a place where we were requiring them to be a part of  
3 the team throughout.

4 However, we did require that they were  
5 enough of the process, and pulled into enough of the  
6 process, that they were comfortable with the equipment  
7 selection with these systems that are identified as  
8 well as with this --

9 MEMBER STETKAR: I have made a lot of  
10 plumbing mistake because I wasn't smart enough to call  
11 a plumber.

12 (Laughter.)

13 MR. CHOKSHI: Yes, I think that is a  
14 comment that --

15 MS. KAMMERER: That is a comment we will  
16 take away, now that we have one more day.

17 (Laughter.)

18 MEMBER STETKAR: And you can ask my  
19 neighbors.

20 (Laughter.)

21 In all seriousness, people who have gone  
22 through this exercise find out that, without that  
23 operational perspective from day one, you may come up  
24 with a very different list of equipment and a very  
25 different focus of the walkdowns.

1 MS. KAMMERER: Okay. It looks like --

2 MR. STARCK: My name is Richard Starck.  
3 I am the principal editor of the seismic walkdown  
4 guidance.

5 Mr. Stetkar, you are right in your  
6 perspective that you do need plant operations  
7 personnel intimately involved when you are developing  
8 an equipment list coming down from the top and  
9 identifying all the functions to be sure that plant  
10 operating procedures are in place, and so forth.

11 What is important is that that process is  
12 being done, but, then, we are selecting a sample of  
13 this equipment. As a consequence -- and Annie will  
14 get into the sampling -- and I think perhaps the level  
15 of plant operations personnel involved in the review  
16 of this activity is appropriate considering the  
17 sampling approach that is going to be used in this  
18 process.

19 MEMBER BLEY: I just need to say, from  
20 actually going on walkdowns of various sorts, when you  
21 get out there, very, very good seismic engineers and  
22 mechanical engineers who don't operate equipment, when  
23 they walk up to something and start evaluating it,  
24 often have funny ideas of how it is actually used.  
25 Without having an operator along, you miss the boat.

1 Are we writing a letter on this or is this  
2 going too fast for us to be writing a letter, Steve?

3 CHAIR SCHULTZ: We have not yet determined  
4 that we are going to write a letter.

5 MEMBER BLEY: If we did, this would be in  
6 there somehow.

7 (Laughter.)

8 MR. CHOKSHI: I think we have taken this  
9 comment. I think I understand what -- I think the  
10 concepts are here, but not as clear and maybe as  
11 explicitly as you are indicating. Let's take that  
12 comment. Okay?

13 MEMBER SKILLMAN: I would like to address  
14 a variant of John Stetkar's question, please. In  
15 1969, 1970, 1971, 1972, there was not clear guidance  
16 on what needed to be seismic. It was not until Reg  
17 Guides 1.26 and 1.29 were published, and those were  
18 published in about 1970, 1971, 1972.

19 And then, there was always the question  
20 about active seismic. Your high-pressure injection  
21 pumps needed to function through the accelerations of  
22 the earthquake. Hence, came Reg Guides 1.48, 1.60,  
23 and 1.61.

24 But that rulemaking was four, five, six  
25 years later than a certain population of plants that

1 were, by then, licensed.

2 MR. CHOKSHI: Right.

3 MEMBER SKILLMAN: So, my question is, is  
4 there a population of nuclear plants, the older plants  
5 in the fleet that probably have had life extensions,  
6 whose seismic robustness might be questionable because  
7 the systems that you would identify on your list is  
8 not a complete listing of the systems or the functions  
9 required for safe shutdown?

10 MR. CHOKSHI: Yes, I think you are right,  
11 there was a group of plants. And then, we had a SEP  
12 Program, Systematic Evaluation Program, in the late  
13 seventies, mid to late seventies and almost went up to  
14 the eighties, where we would look at all these old  
15 generation plants and look at all of the natural  
16 hazard design bases and many other things. And they  
17 went through reevaluation, where it is like the  
18 seismic, there was additional seismic requirements  
19 were identified.

20 And that guidance included the new hazard  
21 level, how to select equipment. It was not as  
22 extensive as the plants being licensed after. So,  
23 they went through this program, SEP.

24 I think most of those plants, I don't  
25 think any one of them is currently operating. These

1 were already old plants. I think we are now talking  
2 about Yankee Rowe, Big Rock Point, San Onofre 1,  
3 because those were the plants where there was a gap,  
4 before the publication of the Appendix A and the late  
5 sixties, you know, where these plants were designed,  
6 and they were ad hoc. But those plants have gone  
7 through the Systematic Evaluation Program.

8 There was another group of plants where  
9 the seismic equipment qualification was an issue.  
10 They were not using the latest requirements, and they  
11 were the USIA-46 plants. A lot of this approach and  
12 the section come from A-416 type of activity, which is  
13 more comprehensive.

14 So, I think they are addressed in part,  
15 the concern you raised, you know. The equipment list,  
16 if you look at it now, it is much broader.

17 And I think, as Annie will go through, for  
18 these purposes, we are starting with the functions.  
19 We are establishing the major functions, including  
20 containment functions, and then go down to the  
21 equipment list to try to capture the diversity. I  
22 think it will probably be better after she explains  
23 that, and we can come back to that question.

24 But you are right, some of the old plants,  
25 that was an issue.



1 MEMBER SKILLMAN: Thank you.

2 MS. KAMMERER: For most of the personnel  
3 that are involved, the principal requirement is  
4 experience and knowledge in the areas in which they  
5 are working. We are looking for different people to  
6 be working in areas in which their experience is  
7 targeted.

8 The seismic walkdown engineers also have  
9 additional requirements for training in the area.  
10 They have to have experience in seismic engineering as  
11 it relates to the plants, and they had to have  
12 completed either a new program, which EPRI and NEI are  
13 developing called the Near-Term Task Force 2.3 Seismic  
14 Walkdown Training Course or the SQUG Walkdown Training  
15 Course.

16 MEMBER ARMIJO: What is SQUG?

17 MS. KAMMERER: SQUG is the Seismic  
18 Qualification Utility Group. Is that right?

19 MR. CHOKSHI: Yes.

20 MS. KAMMERER: That has actually been a  
21 program which has been going on for a very long time.  
22 It is a week-long, very intensive program.

23 The EPRI Near-Term Task Force is  
24 specifically targeted to performing the walkdowns as  
25 it relates in this guidance. They are two-day

1 training courses which are going to be held throughout  
2 the month of June. There is going to be a large  
3 number of industry folks that are doing them. This is  
4 the course which we are going to try to tape and do as  
5 facilitated training for all of our resident  
6 inspectors.

7 MEMBER STETKAR: Annie, kind of as a  
8 followup to my obvious desire to have an operator  
9 involved in the walkdowns, the guidance currently says  
10 that the walkdowns are conducted by teams or a team of  
11 two of the seismic walkdown engineers.

12 Now the seismic walkdown engineers are  
13 obviously civil, structural, mechanical engineer types  
14 who understand --

15 MS. KAMMERER: Right.

16 MEMBER STETKAR: -- you know, anchorages  
17 and that sort of stuff. However, if I read the  
18 guidance, they make decisions and draw conclusions  
19 based on their judgment of whether a seismic event at  
20 the design-basis earthquake acceleration would cause  
21 failure of something. Now failure translates into  
22 things like failure modes and what important failure  
23 modes might affect the functioning of the equipment.

24 What type of specific training do those  
25 people gain through this two-day session in evaluating

1 equipment, seismically-induced equipment failure  
2 modes, not structural breaking of a bolt, but  
3 seismically-induced equipment failure modes?

4 MS. KAMMERER: These engineers are not  
5 making that kind of judgment on the spot. What they  
6 are looking for is they are looking for degradation.  
7 They are looking for discrepancies with the anchorage  
8 configurations. They are looking for spatial  
9 interaction. They are looking at a variety of  
10 conditions.

11 If they have any issues or questions  
12 regarding that, it needs to be documented and it goes  
13 to the licensing-basis review.

14 MEMBER ARMIJO: Are they concentrating on  
15 the physical state of the equipment?

16 MS. KAMMERER: That is correct.

17 MEMBER ARMIJO: That's it?

18 MS. KAMMERER: That is correct.

19 MEMBER ARMIJO: And you are saying this  
20 thing is -- okay.

21 MS. KAMMERER: That is correct. If there  
22 is any question whether they think that this thing  
23 will survive the accelerations consistent with the  
24 design basis, they should be documenting that and it  
25 should be going in for further review.

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1 MEMBER STETKAR: I was going to ask this  
2 on the walkby area, but since I brought it up and you  
3 sort of alluded to it, I will ask it now.

4 MS. KAMMERER: Uh-hum.

5 MEMBER STETKAR: In the guidance for the  
6 walkbys there are quite a bit of -- I could pull out  
7 the quotes -- but there are areas where the seismic  
8 walkdown engineers assess the credibility of a  
9 particular failure. The word "credible" is used a lot  
10 in that guidance.

11 Therefore, they are making judgments about  
12 not only physical status of things, but they are  
13 making judgments about specific failure modes,  
14 credibilities which translates into an effective  
15 fragility on the spot, and are signing their name  
16 saying I don't think this is credible.

17 So, that is why I was asking about their  
18 training in making those types of assessments.

19 MS. KAMMERER: They are not making  
20 judgments regarding credibility of failure modes.  
21 What they are looking for is degradation, potential  
22 for interaction, which, again, if there is any  
23 question about the potential for interaction, that  
24 should be documented and sent to the licensing-basis  
25 reviewer to see what analyses occurred in the past.

1 They are looking at the potential for seismically-  
2 induced fire and flood initiators that may be present.

3 They are not assessing whether or not they  
4 think that that -- and trying to make sort of  
5 fragility calculation. What they are doing is trying  
6 to identify --

7 MEMBER STETKAR: Let me read you a couple  
8 of quotes out of Section 4. Now I have only got the  
9 May 8th version, so this might have been changed.

10 But in Section 4, it says, "If adequate  
11 seismic supports are not present or there are  
12 isolation valves near the tanks or charging sources,  
13 flooding may not be a credible concern. The seismic  
14 walkdown engineers should exercise judgment to  
15 identify credible seismically-induced interactions  
16 that could lead to flooding or spray."

17 Why are they not now exercising judgments  
18 about the credibility of a certain failure mode that  
19 could affect something?

20 MS. KAMMERER: If there is a question with  
21 regard to the condition of the plant -- I mean, at  
22 some point, these walkdown engineers have to be able  
23 to say something is clearly sufficient or there is  
24 insufficient anchorage. And so, if there are things  
25 where it is unclear whether or not it is consistent

1 with --

2 MEMBER STETKAR: I am asking about their  
3 training. Your guidance says that they must assess  
4 the credibility of certain failures. It might be  
5 failure modes. It might be anchorage adequacy to  
6 avoid a failure. It is their credibility. I am  
7 asking, where in their training is there a provision  
8 for saying that they are adequately trained to  
9 understand their assessment of what is credible and  
10 what is not credible?

11 MR. CHOKSHI: Yes, I think it is a good  
12 comment to say, well, how they can retrain when there  
13 is a question.

14 MEMBER STETKAR: Right.

15 MR. CHOKSHI: When the question is --

16 MEMBER STETKAR: If I could be satisfied  
17 that, indeed, the training that is going to be  
18 performed --

19 MR. CHOKSHI: Yes, yes.

20 MEMBER STETKAR: -- would give them an  
21 adequate background to assess that issue of  
22 credibility or at least --

23 MS. KAMMERER: We are not overseeing the  
24 training, and we haven't seen the training.

25 (Laughter.)

1           And so, really, you know, I mean, training  
2       courses have been developed for a long time. In fact,  
3       Dick is actually developing the training. But,  
4       clearly, that is something that they are going to need  
5       to incorporate in there, is examples of sufficient and  
6       insufficient anchorage.

7           MEMBER STETKAR: Well, I have been on  
8       walkdowns with several people who meet all of the  
9       mechanical, civil, structural engineering, seismic  
10      engineering qualifications, and they don't have the  
11      foggiest notion of what the credibility of a  
12      particular failure mode is. That is not what they do,  
13      unless they are asked to assign a fragility or HCLPF  
14      capacity; that is a measure of credibility. That is  
15      a measure of their technical knowledge of the  
16      likelihood of something failure. But I don't see them  
17      being asked to do that.

18           MR. CHOKSHI: No, I think that is a good  
19      comment.

20           MS. KAMMERER: Yes, yes.

21           MR. CHOKSHI: And I think one other thing  
22      may be the industry needs to take into -- you know,  
23      they are still formulating the training. And we need  
24      to sort of look at when we get the training. I mean,  
25      that is a good comment because we are looking for

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1 people to be able to have an ability to raise those  
2 questions, because that is how they will get into part  
3 of the process.

4 MEMBER STETKAR: That's right. That's  
5 right. That's right. You know, they are very well,  
6 they can be very well-qualified to assess the  
7 capacity. That is different than --

8 MR. CHOKSHI: I am reacting to you. I  
9 think this is a very good comment. But maybe the way  
10 the training course can address that is by selecting  
11 some examples, as Annie was saying. "Here are the  
12 type of questions, judgment questions."

13 And again, I think your earlier comment  
14 about plant operation, involvement of plant  
15 operational personnel, it is key to defining those  
16 kinds of situations.

17 MEMBER ARMIJO: Am listening to John's  
18 comments and I am trying to see, the kind of question  
19 that John is asking gives me the impression that you  
20 can't train a guy to do that in a two-day course.

21 (Laughter.)

22 You have got to pick a guy who has got  
23 that experience and put him on the team, and I think  
24 that is really the point. Is that really the point?

25 MEMBER STETKAR: Yes.



1 MEMBER ARMIJO: Okay.

2 MEMBER STETKAR: Yes.

3 MS. KAMMERER: But the challenge is it is  
4 really challenging because, within the community, to  
5 meet the timeline and the objectives of this program,  
6 that group of people does not exist. There is not  
7 enough people to do it. We have to train people to be  
8 able to perform these functions.

9 And that is why there is a very strong  
10 peer-review component. That is why there is a lot of  
11 different people involved. That is why our resident  
12 inspectors are going to be trailing along.

13 MR. CHOKSHI: And it is ongoing, right?

14 MS. KAMMERER: And it is ongoing. And,  
15 remember, there will be a followup which we will be  
16 looking at fragility in the elements for 2.1 coming  
17 after.

18 And within the way that they are  
19 conducting the walkdowns, the two engineers have to  
20 come to agreement, and if they don't, that person who  
21 is taking the more conservative viewpoint, that is  
22 what we follow.

23 And also, the idea is that anything that  
24 is questionable goes to the licensing-basis review  
25 because we recognize that some of these people are not

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1 going to have the experience that we would have liked  
2 optimally to have seen in this.

3 MEMBER RAY: Well, I guess the word  
4 "credible" is an old word. We have used it all the  
5 time I have been involved in this business, and it has  
6 been a long time. But I have never found anybody who  
7 knew what it meant.

8 (Laughter.)

9 What does it mean to you? What do you  
10 intend it to mean?

11 MS. KAMMERER: Well, what it means to me  
12 is that, if you look at the particular situation, be  
13 it an anchorage condition, be it the potential for  
14 interaction, there is some probability, even if it is  
15 low, that the condition that you are worried about  
16 would occur.

17 MEMBER RAY: Okay. I think that is fair.  
18 But you are meaning them to think that there are  
19 people, ideally, although they are not readily-  
20 available, as you say, but, ideally, there is somebody  
21 who can make that judgment, could make that judgment,  
22 in principle?

23 MS. KAMMERER: Yes. For a lot of these  
24 conditions, it would be in the licensing basis  
25 already. For example, if you have two pieces of

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1 equipment which you are concerned that there may be a  
2 potential for interaction, you can look and you can  
3 see under the design-basis earthquake if that has  
4 already been analyzed and, if so, if the --

5 MEMBER RAY: Well, you don't need the  
6 qualification "credible" in those kinds of cases.

7 MS. KAMMERER: Right.

8 MEMBER RAY: I am really trying to figure  
9 out, because this comes up a lot really -- I am out in  
10 the field now, and I am wondering, what did the agency  
11 mean by "credible". I don't have a clue. I am  
12 standing here talking to my resident inspector; he  
13 doesn't know. How do we interpret this word  
14 "credible" when we are doing our walkdowns? I mean,  
15 John has made a point that it is used often. There  
16 must be a reason.

17 MS. KAMMERER: We expect that, when the  
18 training looks at it, that they are expressing it in  
19 a way similar to how I expressed it. But we don't  
20 want them standing out there and saying, "Well, it may  
21 be; it maybe won't be." If it may be a problem, they  
22 should be documenting that and it should be going to  
23 the licensing-basis review --

24 MEMBER RAY: And you think that that is  
25 clear that that is what is meant by "credible"?

1 MS. KAMMERER: I think so. We can  
2 certainly add it, you know, add a stronger definition,  
3 if it is not.

4 MEMBER RAY: Well, I mean, it is just a  
5 tough word.

6 MS. KAMMERER: I mean, I think that that  
7 is a good point.

8 MEMBER RAY: I am dealing with that in a  
9 different context right now.

10 MS. KAMMERER: Right.

11 MEMBER RAY: I will tell you, nobody knows  
12 what was meant 30 years ago, when the word "credible"  
13 was used.

14 (Laughter.)

15 MEMBER BLEY: My experience is different  
16 than Harold's. To me, everybody knows what it means,  
17 but it means something different to everybody. But  
18 everybody thinks they know what it means.

19 (Laughter.)

20 MEMBER RAY: But I am just really striving  
21 to find out what does the agency mean when they say  
22 that because -- anyway, enough on it. I am not going  
23 to pester you more.

24 MR. CHOKSHI: I think you are right, and  
25 I don't think this group can define "credible" in a

1 universal sense.

2 MS. KAMMERER: Right.

3 MR. CHOKSHI: But we can do it maybe in  
4 the context of this: here is a bit better definition.

5 MS. KAMMERER: Yes, yes.

6 MEMBER STETKAR: Quite honestly, I liked  
7 your answer, but I didn't get that sense --

8 MS. KAMMERER: From the document?

9 MEMBER STETKAR: -- reading the words in  
10 the document.

11 MS. KAMMERER: Yes. Well, then, we need  
12 to be --

13 MEMBER STETKAR: That your answer tended  
14 to err in the direction of, if you have a question,  
15 write it down.

16 MR. CHOKSHI: Raise it, right.

17 MEMBER STETKAR: The document seemed to  
18 say that if I, as a walkdown engineer, deemed this not  
19 to be credible, it was eliminated. And all I have to  
20 do is sign that I didn't find any credible  
21 interactions or any credible failures.

22 MS. KAMMERER: Right. Okay. I will  
23 definitely --

24 MEMBER STETKAR: Which is a different,  
25 kind of a different --

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1 MS. KAMMERER: Yes. When we get the  
2 document tomorrow -- (laughter) -- in a way, it is  
3 unfortunate that it has been delayed, but I might be  
4 extremely fortunate in some ways. We will definitely  
5 take a look at that and see if we can add some  
6 additional language in there.

7 Kimberly Keithline of NEI.

8 MS. KEITHLINE: This is Kimberly Keithline  
9 from NEI. And I appreciate that discussion.

10 Can you hear? Okay.

11 I appreciate that discussion. I think we  
12 do need to take a careful look at the wording in that  
13 section --

14 MS. KAMMERER: Yes.

15 MS. KEITHLINE: -- to make sure that it is  
16 not suggesting that the seismic walkdown engineers are  
17 going out and doing fragility-type evaluations --

18 MS. KAMMERER: Right, right.

19 MS. KEITHLINE: -- or analyses, because  
20 that is not what we intended. So, we will look at  
21 that. We will make sure it doesn't overstate what is  
22 going on, and we will make sure it is clear that, if  
23 there is doubt, it certainly goes on to the next step.

24 And we are just starting now to work on  
25 developing the training because we needed to have the

1 guidance defined first. And so, we will definitely  
2 keep that feedback in mind. Okay.

3 MEMBER SIEBER: Do any of these walkdowns  
4 require any testing? For example, pull tests on Hilti  
5 bolts?

6 MS. KAMMERER: No.

7 MEMBER SIEBER: The fragility of equipment  
8 sometimes is dependent on how well it is fastened.

9 MS. KAMMERER: Yes.

10 MEMBER SIEBER: And looking at it, you  
11 can't tell.

12 MS. KAMMERER: The fragility of equipment  
13 will be part of the 2.1 walkdowns.

14 MEMBER SIEBER: At any place in the  
15 process do you do tests on Hilti bolts or torque tests  
16 on --

17 MS. KAMMERER: It is not part of this  
18 process, unless there is a question, in which case it  
19 goes into the CAP and it goes through that process.  
20 Extend condition is considered, and that may be  
21 pulling additional equipment in.

22 MR. CHOKSHI: It is primarily visual  
23 conditions and some other component.

24 MS. KAMMERER: Right.

25 MEMBER SIEBER: Well, my comment is, in my

1 personal experience with seismic walkdowns and  
2 testing, that was a vulnerability because it changes  
3 equipment fragility.

4 MS. KAMMERER: Yes.

5 MR. CHOKSHI: Right.

6 MEMBER SIEBER: You can't tell it by  
7 looking at it.

8 MR. CHOKSHI: Yes.

9 MS. KAMMERER: Right.

10 MEMBER SIEBER: You actually have to do  
11 something physical, and it is not a rare occurrence.  
12 It either can be a deficiency in the installation or  
13 it could be age-related because --

14 MS. KAMMERER: Right. Or vibration-  
15 related.

16 MEMBER SIEBER: -- those are put into  
17 concrete; concrete changes.

18 MS. KAMMERER: Yes.

19 MR. CHOKSHI: Yes.

20 MEMBER SIEBER: Constant stress distorts  
21 things. I think that is a vulnerability.

22 CHAIR SCHULTZ: Dick, you had a comment?

23 MEMBER SKILLMAN: Yes, Steve.

24 I think one of the challenges that you are  
25 going to discover is the rarity of plant operations

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1 personnel. The staffing is so thin, intentionally  
2 thin because of cost, the individuals that the teams  
3 will most likely want are some of the most experienced  
4 and senior operators, and they are loathe to give time  
5 to this type of activity. So, unless there is a  
6 fairly significant senior management commitment to  
7 make that group of men and women available, then the  
8 teams will suffer.

9 Because I am with John Stetkar in the need  
10 for plant operations personnel who really have a  
11 practical understanding of what this equipment needs  
12 to do, because they internalize it in terms of  
13 procedures, of what is needed, what other events are  
14 occurring simultaneously with the event where this is  
15 being done. I think this is going to be a real  
16 challenge.

17 MS. KAMMERER: That is a comment that we  
18 have gotten, exactly that; that the people that we  
19 really would like to see pulled in the most and be the  
20 most involved are the ones that are going to be the  
21 most challenging to really schedule around.

22 One of the ways I know that we tried to  
23 address it in the documentation is by laying out the  
24 need very early to do all of your scheduling early, to  
25 make sure that you can bring the people in at the

1 times that you would need them, so that they know well  
2 in advance when they may be requested to be in this  
3 program, when the peer reviews of the things that they  
4 would know the most about are occurring, so that they  
5 are involved throughout.

6 In fact, that was a topic of discussion  
7 just yesterday. It was a discussion yesterday in  
8 terms of the peer review and how do we make the  
9 language just right, so that we are not making it  
10 overly onerous -- especially, there was a discussion  
11 about multi-unit facilities, in particular -- while  
12 still making sure that they are pulling in the right  
13 expertise to assure a quality job.

14 MEMBER SKILLMAN: And another piece of  
15 this will be plant mode specificity.

16 MS. KAMMERER: Yes.

17 MEMBER SKILLMAN: Some of this equipment  
18 is only inspectable under specific conditions.

19 MS. KAMMERER: Right.

20 MEMBER SKILLMAN: Now that introduces  
21 needing to have the correct team available at the  
22 correct time and place.

23 MS. KAMMERER: Right.

24 MEMBER SKILLMAN: And if you have got two  
25 or three units on a site, and sometimes you share some

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1 of these experts, that Rubik's cube gets very  
2 complicated.

3 MR. CHOKSHI: Yes. We talked about that.

4 MS. KAMMERER: Yes, that was a point of  
5 discussion yesterday as well.

6 MEMBER SKILLMAN: Thank you.

7 MS. KAMMERER: The licensees are very  
8 concerned about how they are going to do that.

9 Okay. So, then, I guess just the last  
10 comment on that. We are going to try to bring in that  
11 same training for all the NRC staff who would like to  
12 do complete it as well.

13 MEMBER STETKAR: By the way, Annie --

14 MS. KAMMERER: Yes?

15 MEMBER STETKAR: Because I know you are  
16 under a really short fuse, and you said NEI is turning  
17 this stuff around, to kind of follow up, I mentioned  
18 Section -- whatever the heck it was -- 4 or something  
19 like that. Look at Appendix D also.

20 MS. KAMMERER: I'm sorry, which version  
21 did you say you had?

22 MEMBER STETKAR: I had May 8th. So, I am  
23 not sure whether it has morphed. I am sure it has,  
24 actually.

25 But in Appendix D in the May 8th version,

1       there is more discussion about walkdown engineers  
2       should be used to differentiate between likely and  
3       unlikely interaction hazards.

4               MR. CHOKSHI:   Okay.

5               MEMBER STETKAR:   So just, if people are  
6       doing editing on a 24-hour turnaround here --

7               MS. KAMMERER:   Yes.

8               MEMBER STETKAR:   -- I just wanted to  
9       highlight a couple of places that I found that sort of  
10      credible-versus-incredible,   likely-versus-unlikely  
11      type of language in the document --

12              MR. CHOKSHI:   Right.

13              MS. KAMMERER:   Okay.

14              MEMBER STETKAR:   -- just to kind of raise  
15      it.

16              MR. CHOKSHI:   Yes.

17              MS. KAMMERER:   Yes.

18              MEMBER STETKAR:   You hate to see it get  
19      fixed in one place or addressed, let's just say, in  
20      one place and not in another.

21              MS. KAMMERER:   Yes.   What I will do, when  
22      we receive it tomorrow, we can do a universal search  
23      on "credible".

24              MEMBER STETKAR:   Look at "credible" and  
25      look at "likely" and "unlikely" --

1 MS. KAMMERER: We will take a look at  
2 that.

3 MEMBER STETKAR: -- those types of trigger  
4 words.

5 MS. KAMMERER: Because we still have the  
6 closeout on Friday to make sure that all of those  
7 words are exactly the way we like them. We feel  
8 pretty comfortable with the concepts and the  
9 agreements that we have come to, but, I mean, the  
10 wordsmithing is where we are now and it is our biggest  
11 challenge.

12 Okay. Could I have the next one?

13 Okay. So, as we mentioned, because of the  
14 nature of the safe shutdown equipment list and the  
15 large amount of equipment that would get pulled, we  
16 are basically talking, depending on the plant,  
17 somewhere between 900 to about 2,000 pieces of  
18 equipment on the broader list. Because that is a real  
19 challenge in the amount of time that we have, we were  
20 looking at doing a smart sampling approach to broadly  
21 sample the NPPs, with the idea that we are looking  
22 across conditions, and then with mechanisms to  
23 increase the sample if issues are identified and,  
24 also, using the concept of a walkby to look at a  
25 broader number of pieces of equipment. The sampling

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1 is going not only across equipment categories and  
2 systems, but also across the five safety functions,  
3 which includes containment.

4 There is also a discussion, a requirement  
5 of the 50.54(f) letter to look at spent-fuel pools.  
6 And so, that is a separate SSEL and SWEL which I will  
7 talk about how those are identified in just a minute.  
8 Both of them will be pulled together, both the broader  
9 sets of the safety-related equipment and the spent-  
10 fuel pool equipment into a complete SWEL which will be  
11 walked down and supplemented by the area walkbys and,  
12 also, any expansion of the equipment review as part of  
13 the CAP.

14 MEMBER ARMIJO: Annie, will the SWEL list  
15 be unique to each plant?

16 MS. KAMMERER: Yes.

17 MEMBER ARMIJO: And the answer yes, but  
18 will all plants have to evaluate, let's say, a set of  
19 required pieces of equipment that have to be looked  
20 at? Is there some kind of, yes, you can have a plant-  
21 unique thing, but you must look at this, this, this,  
22 and this?

23 MS. KAMMERER: Well, each of the plants  
24 is, of course, different. In terms of the spent-fuel  
25 pools, we are --

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1                   MEMBER ARMIJO: I don't care about the  
2 spent-fuel pools.

3                   MS. KAMMERER: Okay.

4                   MEMBER ARMIJO: I am just talking about  
5 the power plant.

6                   MS. KAMMERER: We are not providing the  
7 list of required equipment. Each of them, they have  
8 to do a sampling which meets the attributes of a  
9 variety of different sort of boxes, and they have to  
10 justify how they came up with those boxes and how it  
11 covers the broader plant equipment, how it is  
12 representative of the broader plant equipment. But we  
13 are not specifying what a sort of base list is.

14                  MR. CHOKSHI: We had a lot of discussion  
15 about the same question. So, in the guidance, we have  
16 identified a number of factors, you know, the  
17 environmental, the diversity of type of equipment, the  
18 diversity of systems. And then, also, in Appendix E,  
19 they have provided a list of systems and functions and  
20 equipment as an example. Okay? And these are printed  
21 out from the EPRI guidance document.

22                  So, there are a lot of questions. The  
23 guidance, I think we have tried to make it as clear as  
24 possible on how you go about selecting samples, and  
25 sample encompasses a lot of conditions.

1 MEMBER STETKAR: Appendix E is more recent  
2 than May 8th?

3 MS. KAMMERER: Yes.

4 MEMBER STETKAR: Okay.

5 MS. KAMMERER: We have added a whole  
6 variety of appendices. And that might not have had  
7 the separate section on IPEEE as well.

8 MR. CHOKSHI: The idea was that one time  
9 we are thinking about, okay, let's look at a couple of  
10 very good PRAs or margins.

11 MEMBER STETKAR: Well, let me ask  
12 something, not to cut you off, but we are getting a  
13 little short on time.

14 MR. CHOKSHI: Yes, yes.

15 MEMBER STETKAR: Perhaps the version that  
16 we haven't seen may address some of these concerns.  
17 so, let me just ask.

18 MR. CHOKSHI: Okay.

19 MS. KAMMERER: Yes.

20 MEMBER STETKAR: I understand sampling  
21 from the list of 21, if the list of 21 still exists.

22 MS. KAMMERER: Yes.

23 MEMBER STETKAR: Does it?

24 MS. KAMMERER: Yes.

25 MEMBER STETKAR: Okay. You know, one from



1 each of those boxes, if you will. The remaining 80  
2 percent of your 100-item sample, the guidance, at  
3 least in the version that I saw, let me just say it  
4 was much less than clear about how the process would  
5 ensure that you would get a reasonably-diverse sample.

6 One of the questions that I had -- you  
7 mentioned another section about IPEEE --

8 MS. KAMMERER: Yes.

9 MEMBER STETKAR: -- is there was some  
10 discussion in there about looking perhaps -- perhaps  
11 -- at the IPEEE and dominant or important contributors  
12 identified in the IPEEE. I don't know what that  
13 means. It talked about cutsets and things like that.

14 A more relevant measure of importance  
15 would be not a seismic PRA because nobody or very few  
16 people did that. And certainly, it would not apply to  
17 all plants. But Fussell-Vesely importance, Risk  
18 Achievement Worth from the existing PRAs to identify  
19 pieces of equipment, such that if they did fail, they  
20 were important to plant risk. And they don't care how  
21 it fails. It could fail seismically. It could fail  
22 any way.

23 Is that concept now more integrated into  
24 this newer version in terms of a process to identify  
25 that other 80 percent of the things that you are

1 looking at?

2 MR. CHOKSHI: Actually, I think that  
3 things have sort of changed a little bit. Right now,  
4 because this is focusing a lot on the design basis, we  
5 took out the risk-dominant and that sort of language  
6 because we have sort of focused more to think about  
7 the current licensing basis.

8 MEMBER STETKAR: Okay. How do I select  
9 the other 80 percent of my population now?

10 MS. KAMMERER: Well, if you are looking  
11 across systems, across classes, across environments --

12 MEMBER STETKAR: Let me ask you about  
13 environment. I understand environment. But, in my  
14 experience, it is much more useful -- I would rather  
15 look at one piece of equipment in 100 different  
16 locations in the plant than 30 pieces of equipment in  
17 one room, for example.

18 And I understand theoretically people  
19 about environment and aging, but there are -- after  
20 all, this is Seismic Category 1 safety-related  
21 equipment that we are talking about. There are  
22 environmental qualification requirement for that sort  
23 of stuff that may not address location-specific issues  
24 that would be identified during the walkbys, for  
25 example.

1 MR. CHOKSHI: Yes.

2 MEMBER STETKAR: So, broadening the  
3 perspective, if I had a choice of looking at two  
4 pieces of equipment in one environmentally-challenged  
5 location versus one piece of equipment in each of two  
6 different locations that might have different  
7 anchorages, that might have different other things  
8 running through them, it would seem that the second  
9 would provide me a much broader perspective of the  
10 status of the plant, given the fact that I am only  
11 taking a snapshot of 100 items. I don't know whether  
12 the revised version has more of that thought process  
13 in it.

14 MS. KAMMERER: Well, it definitely has a  
15 lot more discussion about how one does the sampling.

16 MEMBER STETKAR: It does? Okay.

17 MS. KAMMERER: But looking at the broad --  
18 again, we don't want to just look at one set of pumps,  
19 say, across because we need to get a sample which is  
20 representative of the broader plant. But it  
21 definitely discusses -- yes, some of the early drafts  
22 were confusing in that it almost seemed like the  
23 discussion started by screening everything out to get  
24 to a sample. And then, it wasn't very clear on the  
25 fact that, then, you needed to identify, to pull in --

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1                   MEMBER STETKAR: I will cut myself short  
2 here because it is obvious that I haven't seen kind of  
3 the current version of the guidance, and it sounds  
4 like it has addressed some of these issues. So, I  
5 will wait to see what comes out.

6                   MS. KAMMERER: It has been very dynamic.  
7 But I will say that we have made an effort to make  
8 sure that we were addressing things across the plant,  
9 across the systems, across locations, across  
10 environments, so hot and cold, wet/dry, and with the  
11 idea that we are looking at consistency with the  
12 current licensing basis and how the plant broadly  
13 looks in terms of that specific criteria.

14                   And also, one element of that is, because,  
15 of course, half of the challenge of getting to do a  
16 walkdown of a piece of equipment is actually getting  
17 to the piece of equipment and gaining access to it,  
18 and that is why, by looking at a range of locations  
19 throughout the plant, and when you are standing in  
20 front of that piece of equipment doing an equipment  
21 walkdown, we have also incorporated the idea of the  
22 area walkbys, which, then, look at everything else  
23 within that space, the other SSEL pieces of equipment,  
24 looking for obvious degradation, interactions, things  
25 like that; the seismic flood and fire initiators.

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1           And so, in that way, while we are really  
2           focusing a lot of effort on somewhere between 90 to  
3           120 pieces of equipment, to say, are the plant  
4           procedures and the way this plant is maintained, and  
5           the ongoing question of are they sure that they are  
6           putting things back in a way that is consistent with  
7           the licensing basis and really doing a focused look at  
8           these pieces of equipment. We are also capturing a  
9           much broader look at additional equipment, as well as  
10          looking for some of those interaction problems, the  
11          initiator problems, which may be low-hanging fruit,  
12          but give us much more confidence plant-wide.

13                 CHAIR SCHULTZ: Annie, what are you  
14           referring to in the last bullet as it relates to the  
15           Corrective Action Program? You are expecting to mine  
16           that to get some information related to equipment?

17                 MS. KAMMERER: So, when equipment is  
18           identified as potentially a problem, the way we have  
19           it set up is, if the issue cannot be immediately  
20           disposed of as being within licensing basis, if there  
21           is any question or it can't be immediately determined,  
22           or it is not consistent with the licensing basis, it  
23           goes into the CAP.

24                 CHAIR SCHULTZ: Understood.

25                 MS. KAMMERER: As part of the CAP process,

1 a lot of the equipment will have an extensive  
2 condition review, which we expect, if necessary, to be  
3 pulling in additional equipment for review.

4 CHAIR SCHULTZ: Thank you.

5 MS. KAMMERER: Yes.

6 Okay. So, the SWEL 1 is related to the  
7 safety-related systems. We are basically looking at  
8 equipment across the five safety functions. So,  
9 reactivity control, coolant pressure, coolant  
10 inventory, decay heat removal, and we are also  
11 including containment function within those five  
12 safety functions, as consistent with the 50.54(f)  
13 letter.

14 We are addressing, ensuring that a variety  
15 of frontline and support systems are considered and  
16 incorporated into the sampling. Again, the 21  
17 equipment classes are considered to get a range of  
18 equipment.

19 Yes?

20 MEMBER STETKAR: On the 21, unless it has  
21 changed -- I looked at the list in Appendix B, and  
22 since you are going to be sampling and you need to  
23 have one from each of those 21, provided that they  
24 exist at the plant --

25 MS. KAMMERER: Right, right.

1 MEMBER STETKAR: -- I noticed that only  
2 temperature sensors are important. For example, flow  
3 and level and pressure sensors, for some reason, are  
4 not important.

5 So, if I were sampling, it would mean that  
6 I need to sample a temperature sensor because it is  
7 the only kind of sensor that I care about in a plant,  
8 and no plants will ever look at flow level or  
9 pressure-type sensors.

10 MR. CHOKSHI: That is a good question.

11 MEMBER STETKAR: Just an observation. I  
12 mean, you don't need to -- just think about it --

13 MR. CHOKSHI: Right. Yes.

14 MEMBER STETKAR: -- because you are trying  
15 to sample from --

16 MS. KAMMERER: Right.

17 MEMBER STETKAR: -- a variety of systems  
18 and functions here.

19 MS. KAMMERER: Right. That is an  
20 excellent comment.

21 We started with the information, the  
22 documents which were specifically referenced in the  
23 50.54(f) letter.

24 MEMBER STETKAR: I understand.

25 MS. KAMMERER: This came from that. But

1 we will definitely look at that, maybe an additional  
2 comment related to that.

3 So, we have also identified looking at  
4 additional pieces of major or new replacement  
5 equipment that has come in since the last walkdown,  
6 typically, the IPEEE, because this equipment wasn't  
7 part of those earlier programs, a variety of  
8 environments. And then, we do want to look at some of  
9 the IPEEE vulnerabilities to see what the current  
10 condition is.

11 Okay. This might be different from what  
12 you had previously. This is sort of the schematic  
13 representation of how the SSEL and the SWEL are  
14 developed. Starting with the broad range of SSCs in  
15 the plant, the first screen limits it to Seismic  
16 Category 1 equipment, Seismic Category 1 SSCs. The  
17 second screen, then, reduces it to equipment or  
18 systems which are things that you can, of course,  
19 perform during an equipment walkdown.

20 MEMBER BLEY: Are you doing a separate  
21 structure as a walkdown?

22 MS. KAMMERER: The structures, we are  
23 allowing the elements which are included as standard  
24 that have other programs that consistently have a  
25 walkdown of that, for example, penetrations, or that

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1 are typically qualified through analysis --

2 MEMBER BLEY: So, if we walkdown for  
3 penetrations, we assume, though, and look to see if  
4 the seismic structure is sound. I am confused. I  
5 don't know why, how those two things fit together.

6 MR. CHOKSHI: No, no, I think those are  
7 separate. I think what I am saying, there are  
8 programs. There is like a program for penetrations.  
9 There are also the plants that have programs for  
10 structures. Okay?

11 And for these walkdowns, we are  
12 concentrating primarily on equipment and the spatial  
13 interactions, but not --

14 MEMBER BLEY: Well, I didn't understand.  
15 For the seismic design --

16 MR. CHOKSHI: Right.

17 MEMBER BLEY: -- there are existing  
18 inspection programs for the structures?

19 MR. CHOKSHI: That's right.

20 MEMBER BLEY: That are already covered?

21 MS. KAMMERER: Right.

22 MEMBER BLEY: Okay.

23 MS. KAMMERER: Sorry if I didn't express  
24 that very well.

25 MEMBER BLEY: I didn't know that.

1 MS. KAMMERER: Yes. So, that why we are  
2 doing the focus on equipment assistance.

3 And then, really looking at a target for  
4 the broader safe shutdown equipment list to the five  
5 safety functions.

6 MR. CHOKSHI: Jim, you wanted to add to  
7 this question about the inspection programs?

8 MR. ISOM: I'm sorry, can you please  
9 repeat that question?

10 MR. CHOKSHI: Yes. The question is the  
11 plants have ongoing inspection programs, and  
12 structures is one of them, right? They look at,  
13 periodically, they are required to look at --

14 MR. ISOM: I can't speak to the licensees'  
15 program, but I know in our baseline programs we do not  
16 typically look at seismic, except during our design  
17 inspections we do take a look at that.

18 MS. KAMMERER: Okay.

19 MEMBER BLEY: But I don't understand what  
20 that means related to this. When are your design  
21 inspections? Those are the first --

22 MR. CHOKSHI: Those are --

23 MEMBER BLEY: A long time ago?

24 MR. ISOM: No, no, no. No, we do design  
25 inspections every three years at facilities.

1 MEMBER BLEY: For structures against  
2 seismic capability?

3 MR. ISOM: Yes. I mean, not specifically  
4 for that, but for equipment, to make sure that the  
5 equipment will meet the design basis. So, the seismic  
6 issue could come up if we notice, for example --

7 MEMBER BLEY: What is bothering me is we  
8 are excluding structures from the seismic walkdown  
9 because it is covered somewhere else, but I am not  
10 sure it is.

11 MR. CHOKSHI: We can get you that  
12 information.

13 MS. KAMMERER: Yes.

14 MEMBER BLEY: And structures can be a  
15 major piece of this.

16 MR. CHOKSHI: Yes. There are two things.  
17 The structures, given the time and things to define  
18 what exactly the structure inspections, they could  
19 involve many things.

20 The other thing is, because there are  
21 programs -- I can get you the information.

22 MEMBER BLEY: There are programs looking  
23 at equipment reliability and other things, too, but  
24 not at the seismic characteristic, though.

25 MS. KAMMERER: I think another element,

1 too, is that in 2.1 --

2 MR. CHOKSHI: We will get you the type of  
3 programs, the details.

4 MS. KEITHLINE: Let me just attempt a  
5 little bit. We tried to explain in the guidance that  
6 the walkdowns are not going and re-analyzing the  
7 equipment. So, if you have a structure, if you have  
8 a building, we would not expect a seismic walkdown  
9 engineer to go out and re-analyze the seismic capacity  
10 of the building, but, rather --

11 MEMBER BLEY: Just as you are not re-  
12 analyzing the capability of the equipment?

13 MS. KEITHLINE: Right. So, as Annie has  
14 been describing, and I think she will describe a  
15 little bit more maybe in her presentation, what the  
16 seismic walkdown engineers are looking for are signs  
17 of degradation, signs of potential interactions that  
18 could cause problems.

19 So, for Seismic Category 1 structures, we  
20 are specifically not including those in the walkdown  
21 because there are periodic inspections of Seismic  
22 Category 1 structures that specifically look for  
23 degradation, which would be a similar type of  
24 inspection to what the walkdown engineers are doing  
25 out there in the plants with the components and the

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1 equipment.

2 MEMBER BLEY: Do they look for possible  
3 interaction between two Seismic Category 1 structures  
4 under an earthquake?

5 MS. KEITHLINE: Well, the interaction  
6 issues will be -- are you going to go into like how  
7 the walkbys and how the interactions --

8 MR. CHOKSHI: No, I think --

9 MS. KAMMERER: That is a different  
10 question.

11 MS. KEITHLINE: That is different.

12 MEMBER BLEY: I am questioning this screen  
13 of throwing away the structures in this process.

14 MR. CHOKSHI: The periodic inspection  
15 which Kimberly mentioned, you know, they look at floor  
16 cracking and that sort of thing, all the signs of  
17 degradations that are seen in the form, if things have  
18 changed.

19 The questions within like the two major  
20 buildings, no, I don't think they look at that.

21 MS. KEITHLINE: But that comes into the  
22 walkdown in terms of --

23 MEMBER BLEY: Well, it has just been  
24 excluded from the walkdown by the screen.

25 MS. KEITHLINE: Oh, no. Oh, no. Well,

1 but is it okay if I say something?

2 MR. CHOKSHI: Sure, sure.

3 MS. KEITHLINE: I'm sorry, I don't mean to  
4 take over. I will go sit down in a minute.

5 But this screen is coming up with a set of  
6 equipment.

7 MEMBER BLEY: Yes.

8 MS. KEITHLINE: As part of when they do  
9 the walkdown, they will be looking at that particular  
10 piece of equipment and looking for any potential  
11 seismic spatial interactions around that which could  
12 impact the capability, the ability of that piece of  
13 equipment to perform its function, which gets into the  
14 two-over-one interaction types of concerns.

15 So that structures end up getting reviewed  
16 indirectly through this. I mean, well, not  
17 indirectly, but --

18 MEMBER BLEY: I don't believe it.

19 (Laughter.)

20 MS. KAMMERER: The interaction between two  
21 structures, that would be by analysis. That is not  
22 going to be by visual inspection.

23 So, as long as you have programs where you  
24 are looking at --

25 MEMBER BLEY: And a good idea. In fact,

1 that is how some of the ones that have been fixed were  
2 found, was first by --

3 MEMBER ARMIJO: You mean, just --

4 MEMBER BLEY: By walkdowns that said, boy,  
5 those things are pretty darned close together. Maybe  
6 we had better analyze it. Oh, it's a problem.

7 MR. CHOKSHI: But I think that that would  
8 be very hard, like to do walkdown types of things, as  
9 Annie said, because a lot of those things, you can't  
10 even tell when the building separates. So, those are  
11 things, I think, by analysis -- if you have a clear  
12 two buildings sitting side-by-side, it may be easy,  
13 but the way some of these structures -- but you are  
14 right; in this walkdown we are not looking at that.

15 MEMBER BLEY: I don't completely  
16 understand the reasoning, but go ahead.

17 MEMBER STETKAR: Let me just follow up.  
18 I was going to ask, when we got to SWEL 2, but to  
19 follow up a little bit. Again, I am limited because  
20 I only have the May 8th version of this thing. So,  
21 perhaps you have changes.

22 MR. CHOKSHI: Things have changed, right.

23 MS. KAMMERER: Yes. I sent the one  
24 yesterday.

25 MEMBER STETKAR: But in the selection of

1       SSCs for the spent-fuel pool, there is a quote that  
2       says, "All plants are expected to have a Seismic  
3       Category 1 spent-fuel pool because it is integral to  
4       the Seismic Category 1 reactor building BWR or  
5       auxiliary building PWR."

6               MR. CHOKSHI: Or separate.

7               MEMBER STETKAR: Now do, indeed, all  
8       plants in the United States have a Seismic Category 1  
9       spent-fuel pool structure, yes or no? I mean, one  
10      would know that.

11              MR. CHOKSHI: I would say --

12              MEMBER STETKAR: Not expected, but --

13              MR. CHOKSHI: Yes. I would say yes. Yes.

14              MEMBER STETKAR: Is that true? Okay.

15              It is a question because this doesn't say  
16      all plants have.

17              MR. CHOKSHI: Okay.

18              MEMBER STETKAR: It says, "It is expected  
19      that...", which is, it sounds like, an assumption  
20      somebody made. And then, it says, and furthermore, we  
21      are not looking at structures; so, forget about it.

22              MR. CHOKSHI: So, you are right; we should  
23      make it clear.

24              MEMBER STETKAR: If they all do, that  
25      would at least clarify that kind of -- that would

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1 help.

2 MEMBER SKILLMAN: It seems to me, to be  
3 faithful to the way that the original NTTF  
4 recommendation was rolled out, you must include  
5 structures at some point. Even if in this cascade you  
6 show the structures are in a different bin, they ought  
7 to be accounted for.

8 To me, the best example is the building  
9 that surrounds the emergency diesel generators.

10 MR. CHOKSHI: Right.

11 MEMBER SKILLMAN: That one has got to be  
12 good to go, no matter what is going on.

13 So, it seems to me that somehow, in order  
14 to be faithful to the NTTF 2.1, .2, and .3, you really  
15 need to have the structures included here.

16 MS. KAMMERER: Okay. So, part of the  
17 challenge is the limitation in time that we have on  
18 this. Really, I think in 2.1 we are going to be  
19 looking at an updated assessment of hazard. In that  
20 program, I think getting a more updated load is going  
21 to be a critical review because it is going to have to  
22 happen as part of that work.

23 MR. CHOKSHI: I think part of the reasons  
24 for structures, because we know both from the past  
25 studies and experience, structures there is usually a

1 lot of margin if they are designed to be seismic. In  
2 past analyses, the major structures are found to be an  
3 issue at a very high level of hazard, not generally a  
4 design basis.

5 MEMBER BLEY: Excerpt for quirks. Except  
6 for the unusual situations --

7 MR. CHOKSHI: Yes. Structurally, the type  
8 of things that have come up are things like block  
9 walls, which are structural elements. So, those kinds  
10 of things are included.

11 MEMBER BLEY: How? How? I am confused  
12 now.

13 MR. CHOKSHI: Yes. For example, I think  
14 if you have -- diesel is a good example. Okay? Or  
15 the battery rooms. Many times, because they are in-  
16 filled, there will be block walls next to them. They  
17 are look at it, because the equipment, if the wall  
18 falls, it is a two-over-one issue.

19 MEMBER BLEY: Oh, it is a two-over-one  
20 issue?

21 MR. CHOKSHI: Right. So, that is how  
22 those things are captured. But we haven't looked at  
23 major structural systems. I am not looking at the  
24 shield walls of auxiliary buildings or the containment  
25 shell. Okay? But the smaller components, you know,

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1 which are close to the safety-related elements, those  
2 are included.

3 MEMBER BLEY: I agree.

4 MR. CHOKSHI: Yes. It makes sense for  
5 containment we do periodical testing. There are other  
6 requirements. Because if you say, I want to look at  
7 containment, what do you mean by it? Do I have to do  
8 the 100 percent surface examination? It just didn't  
9 make sense, given the time and things. It is too  
10 concentrate on what has found to be critically  
11 important. And so, we will capture like block walls,  
12 that sort of thing.

13 MS. KAMMERER: The block walls are  
14 specifically included.

15 Okay. So, then, screen three limits the  
16 broader range of SSC equipment to the safety  
17 functions. So, after screen three, everything that  
18 ends up in that broader list is the SSEL, and all of  
19 that is provided to staff in the documentation, so  
20 that we have that starting point at which the example  
21 will occur. So that we have an idea, first of all,  
22 how much equipment is out there, where it is located,  
23 and we can, as we do our review, assure that the SWEL  
24 is a good representation of that.

25 Now bucket 4 or screen 4 is really not a

1 screen of exclusion. It is really more a sampling  
2 approach for inclusion. And I think that that is one  
3 element that was a little bit confusing in the earlier  
4 drafts, and we added a lot of language in terms of  
5 this to assure that we are getting that range of  
6 systems, major new and replacement equipment, so we  
7 can walkdown for the equipment types in the different  
8 environments. So, at the end of this process, then we  
9 end with a seismic walkdown list.

10 Let me get the next slide.

11 So, in SWEL 2, we are basically focusing  
12 on spent-fuel pools. The approach is to go through a  
13 similar approach for the Seismic Cat 1 equipment and  
14 looking at it across the systems and the classes. But  
15 we are also doing a request that all items that could  
16 cause rapid draindown are walked down regardless of  
17 whether or not they are Seismic Class 1.

18 And so, this is sort of how this looks.

19 Yes?

20 MEMBER STETKAR: Draindown meaning total  
21 draindown to the bottom of the pool or draindown, for  
22 example, a third or half or two-thirds of the volume  
23 of the pool?

24 MS. KAMMERER: To the top of the rods in  
25 72 hours.

1 MR. CHOKSHI: I think in the new version  
2 of the document that their definition of rapid  
3 draindown is that it refers to seismically-induced  
4 failures that result in spent-fuel pool water  
5 inventory lost at a rate that could uncover the fuel  
6 within 72 hours.

7 MR. COOK: It should be in the definition  
8 in Appendix G.

9 MR. CHOKSHI: Which you probably don't  
10 have.

11 MEMBER STETKAR: My version ends at  
12 Appendix D, like dog.

13 MR. CHOKSHI: Yes, right.

14 (Laughter.)

15 MS. KAMMERER: Originally, this was an  
16 earlier appendix. So, it might be there.

17 MR. CHOKSHI: Again, I think the industry  
18 probably can better answer this question. But if we  
19 are looking at the makeup systems and when it could  
20 become critical, then I think it is the top of --  
21 before your makeup capability and the balance of --

22 MEMBER STETKAR: You have basically  
23 answered my question.

24 MR. CHOKSHI: Okay.

25 MEMBER STETKAR: I understand.

1 MR. CHOKSHI: Yes. It is a balance  
2 between the two.

3 MS. KAMMERER: Right. So, in terms of the  
4 sampling, it starts out with developing a SWEL, which  
5 we are calling SWEL 2, which has the same approach,  
6 looking at the Seismic Category 1 equipment, limiting  
7 it only to equipment or systems that could be,  
8 actually, walked down. And then, doing a sampling  
9 approach.

10 But, as I mentioned, all of the elements  
11 that could cause rapid draindown, regardless of  
12 whether they were Seismic Category 1 or not, need to  
13 be included. And for those items not included, we are  
14 requiring that a discussion or description of exactly  
15 how that was demonstrated is also included. This has  
16 a third discussion of this component.

17 Okay. So, the next slide.

18 MEMBER ARMIJO: So, unless there has been  
19 degradation of certain pieces of equipment or changes  
20 or something, that would be the end of it? You know,  
21 if it meets its current design basis --

22 MS. KAMMERER: If it meets its current  
23 licensing basis, this is the licensing-basis review.

24 MR. CHOKSHI: I think the screens you  
25 showed was only the creation of SWEL, right?

1 MS. KAMMERER: Right. That's right.

2 MR. CHOKSHI: You didn't go to this?

3 MS. KAMMERER: Right. So, we haven't  
4 gotten to the walkdowns yet. Well, this is how we  
5 have developed the list of equipment to be walked  
6 down.

7 MEMBER ARMIJO: Yes, this would be the  
8 SWEL 2 list --

9 MR. CHOKSHI: Right.

10 MS. KAMMERER: Right.

11 MEMBER ARMIJO: -- for the pools?

12 MR. CHOKSHI: Right, for the pools.

13 MS. KAMMERER: Right.

14 MEMBER ARMIJO: Okay.

15 MR. CHOKSHI: For the pools.

16 MS. KAMMERER: Right, right.

17 So, then, once that has been developed,  
18 there is peer review and it is reviewed by the  
19 operations staff, then the equipment walkdowns and  
20 area walkbys are included. So, the equipment  
21 walkdowns are very equipment-centric. They are  
22 focused, they are intensive, looking for any issues  
23 related to those pieces of equipment.

24 In this case, then the cabinets will be  
25 opened and reviewed. The design of anchorages are

1 confirmed for 50 percent of the equipment. So, of  
2 course, they need to have the anchorage designs in  
3 hand as they do the walkdowns of these pieces of  
4 equipment.

5 And as they are at each piece of equipment  
6 doing a walkdown of that piece of equipment, they also  
7 perform what is called an area walkby. Again, this is  
8 an efficient way to bring in a lot of equipment  
9 because so much of the time that is spent to do the  
10 walkdowns is actually physically getting to that  
11 space.

12 And so, as they are at that piece of  
13 equipment, they conduct what is called an area walkby  
14 where they look at all of the SSEL equipment that are  
15 in that space, visual inspections. So, they are  
16 looking for two-over-one issues against seismically-  
17 induced fire and flood initiators in the room,  
18 overloaded cable trays, obvious degradation of the  
19 equipment, potential anchorage issues.

20 It is different from a walkdown in that  
21 cabinets remain closed. We don't do inside cabinet  
22 inspections for this. And any anchorages that look  
23 odd are confirmed. This is an approach to effectively  
24 extend the sampling and, also, look for some of the  
25 areas that we are now more cognizant of than in the

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1 past, which is seismic interaction and seismically-  
2 induced fire and flood initiators.

3 MEMBER SKILLMAN: Annie, how is the  
4 purpose of the walkby describe in your definitions?  
5 Is its purpose described as intended to add equipment  
6 for inspection? Is that the declared purpose?

7 MS. KAMMERER: It is to provide a visual  
8 inspection of a broader range of equipment at the  
9 plant and, also, look at a broader area of the plant  
10 for potential interactions.

11 MEMBER SKILLMAN: Okay. So, that is what  
12 you do with your eyes. Then, what do you do with your  
13 brain? Do you write something down and say this --

14 MS. KAMMERER: Yes, yes.

15 MR. CHOKSHI: Yes.

16 MEMBER SKILLMAN: Now is the doing part of  
17 that definition?

18 MS. KAMMERER: There is a whole chapter on  
19 it. So, I am not sure that it is listed specifically  
20 in the definitions section.

21 MEMBER SKILLMAN: As you described it, it  
22 really is to expand the population for thoroughness.  
23 That is what I understood you to say. But I am  
24 wondering if the written guidance is faithful to that  
25 idea. Does it make it happen?

1 MS. KAMMERER: Well, I certainly hope so.  
2 It is not listed in the definitions because there is  
3 a long discussion of it in Chapter, I want to say 3.  
4 And there is also a checklist. We have provided a  
5 checklist that is followed. That checklist is part of  
6 the submittal. It is part of the peer-review process.

7 Just like the equipment walkdowns, any  
8 issues that are identified as questionable are  
9 submitted for license-basis review. And if it cannot  
10 be determined that it is consistent with licensing  
11 basis, it also goes into the CAP.

12 MR. CHOKSHI: Yes. There is a walkdown  
13 checklist, walkby checklist.

14 MEMBER SKILLMAN: Thank you. Okay.

15 MS. KAMMERER: Yes. Unfortunately, it is  
16 something we have just developed.

17 Okay. So, this is a schematic which shows  
18 the relationship with the CAP. Of course, you are  
19 taking the SWEL 1 and SWEL 2s, conducting the  
20 equipment walkdowns, the area walkbys for all of the  
21 spaces of each of the pieces of equipment on the SWEL.

22 For anything that potential issues were  
23 identified, it all goes into a licensing-basis  
24 evaluation. For any equipment which has not been  
25 effectively disposed of through that licensing-basis

1 evaluation, so either an issue was identified or it  
2 could not be determined that there was not an issue,  
3 it all gets placed in the CAP and is documented in the  
4 report provided to the NRC.

5 Okay. So, the 50.54(f) letter also has an  
6 item 2<sup>©</sup> which requests a list of plant-specific  
7 vulnerabilities, including any seismic anomalies,  
8 outliers, or other findings identified in the IPEEE  
9 and a description of the actions taken to eliminate or  
10 reduce them, including their completion dates.

11 Now, as was discussed before, in a way, it  
12 is a little bit confusing because all of the rest of  
13 the work that is happening is related to the licensing  
14 basis; whereas, the IPEEE vulnerabilities are sort of  
15 a special category. And so, the way it was addressed  
16 in the latest version is to take those IPEEE  
17 vulnerabilities and treat them really as a special  
18 part of the program, so that it is clearer that really  
19 what we are doing here is a documentation exercise to  
20 really understand what happened subsequent to the  
21 IPEEE.

22 And so, Section 7 provides guidance as to  
23 how to go about that specifically, to meet the request  
24 in the 50.54(f) letter. And in Section, I believe 8  
25 or 9, which is now the documentation section, there is

1 also discussion of exactly what needs to be documented  
2 and provided to the NRC to meet this request for  
3 information. This, of course, is a key component that  
4 feeds into 2.1, so that we understand the current --

5 MEMBER BLEY: Just for my memory, back  
6 when the IPEEEs were done, they were done to identify  
7 longer abilities?

8 MS. KAMMERER: Correct.

9 MEMBER BLEY: Some people, after doing  
10 them, said we are going to fix these three  
11 vulnerabilities?

12 MS. KAMMERER: Yes.

13 MEMBER BLEY: There was no requirement to  
14 fix them, is that right, and probably no requirement  
15 to maintain those fixes? So, this is to go back to  
16 what was actually done and see if it still there and  
17 what the status is?

18 MR. CHOKSHI: Yes.

19 MEMBER BLEY: Is all of that correct, the  
20 way I said it?

21 MS. KAMMERER: Yes.

22 MR. CHOKSHI: Yes, I think the idea was to  
23 really know now what exactly is out there in the  
24 plant.

25 MEMBER BLEY: Okay.

1                   MEMBER RAY: Well, you used the word  
2 "exactly". The problem I have is that the methodology  
3 used was, let's see, it was characterized in one Near-  
4 Term Task Force Report as qualitative, I think.

5                   MR. CHOKSHI: Yes. That is correct, yes.

6                   MEMBER RAY: So, "exactly" and  
7 "qualitative" don't go together, do they?

8                   MR. CHOKSHI: No.

9                   MS. KAMMERER: Right. Yes, basically,  
10 what the 50.54(f) letter requests, the information  
11 requested is a listing of the vulnerabilities which  
12 were identified and what actions were taken or were  
13 not taken, including the completion dates of that  
14 information.

15                   Now, in some cases, from what I  
16 understand, in some cases those changes were actually  
17 incorporated into the licensing basis. We had a  
18 discussion about it yesterday. But, as you state,  
19 that was not universal.

20                   And I think one interesting element of  
21 this which really makes it different than a lot of the  
22 rest of the activities, the walkby and walkdown  
23 activities, is that many of the IPEEE actions related  
24 to processes and procedures and not specifically to  
25 equipment. So, this is sort of probably the biggest

1 area in which a procedures review or understanding the  
2 documentation of how this was implemented in  
3 procedures comes in.

4 MEMBER BLEY: But from what you said, some  
5 people actually did make license amendments and  
6 incorporate --

7 MS. KAMMERER: That is my understanding,  
8 based on the conversation we had with industry  
9 yesterday.

10 MEMBER BLEY: All right.

11 MS. KAMMERER: Yes.

12 MR. CHOKSHI: I think it could depend on  
13 what exactly was the vulnerability.

14 MS. KAMMERER: Okay. So, in the peer  
15 review, this was a long discussion yesterday. We have  
16 a minimum of two peer reviewers on a peer-review team  
17 and a minimum of peer reviewers must be involved in  
18 each part of the review. However, the team is a part  
19 of the process from start to finish.

20 There is an overall review team lead who  
21 is responsible for the overall product and the  
22 documentation. We anticipate that the peer-review  
23 team will be plant personnel that are involved. This  
24 was part of the discussion of how it is challenging to  
25 get some of these senior folks involved at the right

1 times because certainly they are the ones that are the  
2 most skilled and knowledgeable to be able to an  
3 appropriate peer review.

4 In each of the sections, although there is  
5 a team, it is expected that in each of the section  
6 reviews that it will be lead by the team member who  
7 has the most relevant experience/knowledge in each of  
8 those areas. And the peer review will be, of course,  
9 a separate section with a peer-review report in the  
10 documentation which is submitted to the NRC.

11 The peer-review elements specifically  
12 requested are review of the selection of the SSCs in  
13 the SWEL and the whole SSEL actually, review of the  
14 sample checklists that are produced to look for  
15 potential issues related to how the documentation is  
16 being done. And one of the things that we added to  
17 the guidance just yesterday is a discussion of the  
18 benefits of conducting some of the review of the  
19 checklists and the walkdowns and walkbys very early in  
20 the process after, say, a week of the walkdowns have  
21 been conducted, so that the peer reviewers can bring  
22 in some early input into that process; a review of how  
23 the licensing-basis evaluations are conducted, the  
24 outcomes; a review of the decisions for entering of  
25 potential adverse conditions into the CAP, the final

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1 report, as well as, again, a summarization of the  
2 results of the peer-review process in the submittal  
3 report. And that is part of the 50.54(f) request for  
4 information.

5 MEMBER STETKAR: Annie, on the peer-review  
6 team, to make sure I understand how it is constituted,  
7 it has to have at least two people.

8 MS. KAMMERER: Uh-hum.

9 MEMBER STETKAR: Your second bullet on  
10 whatever slide it was two slides ago said the team  
11 lead is responsible for the overall review, right?

12 MS. KAMMERER: Uh-hum.

13 MEMBER STETKAR: Is it correct to  
14 interpret that that one person will be involved in  
15 each of the elements that you showed?

16 MS. KAMMERER: That's right.

17 MEMBER STETKAR: So that there is at least  
18 one person continuity?

19 MS. KAMMERER: Continuity.

20 MEMBER STETKAR: Okay. Good. Thanks.

21 MS. KAMMERER: Right. Right.

22 MEMBER STETKAR: That helps. Thank you.  
23 Thank you.

24 MS. KAMMERER: Sorry if I am not looking  
25 up. I have been spending way too much time reading



1 over the last six weeks.

2 (Laughter.)

3 MEMBER STETKAR: You see that we interrupt  
4 you with no qualms whatsoever.

5 (Laughter.)

6 MS. KAMMERER: Okay. So, as we have gone  
7 through this process, we really have been thinking a  
8 lot about how it is informing Recommendation 2.1.  
9 Obviously, the natural tendency to link the two  
10 together is where we keep heading. And so, we are  
11 really having to separate them, and then make sure  
12 that we have that appropriate handoff, both with  
13 Recommendation 2.1 and also with the resident  
14 inspectors.

15 So, some of the ways that we already see  
16 that this work will be informing 2.1 is, of course,  
17 collection of the information of the IPEEE-related  
18 plant changes. There are some screening activities  
19 that we are looking at in terms of prioritization of  
20 the plants. And so, that is something we need to  
21 understand, how much we can rely on the HCLPFs, for  
22 example, that were reported as part of the  
23 prioritization and screening activities for 2.1.

24 Identification of 2.1 and seismically-  
25 induced fire and flood initiation needs to feed into

1 the risk studies. This is, I think, a really  
2 important element for us to understand what has come  
3 up as a result of the natural plant operations.

4 MEMBER STETKAR: And again, we have to be  
5 careful here because this is only current licensing  
6 basis.

7 MS. KAMMERER: That's correct. That's  
8 correct.

9 MEMBER STETKAR: If you are talking about  
10 in Recommendation 2.1 the broader issue of  
11 seismically-induced flooding or fire, it would strike  
12 me that your sampling of 100 pieces of equipment in  
13 100 or less plant locations --

14 MS. KAMMERER: Right.

15 MEMBER STETKAR: -- is not adequate to  
16 address those broader issues. It gets a start on  
17 those locations, but --

18 MS. KAMMERER: Exactly.

19 MEMBER STETKAR: -- it doesn't get the  
20 hydrogen line through the other location --

21 MS. KAMMERER: Yes. Exactly.

22 MEMBER STETKAR: -- if you didn't look at  
23 it.

24 MS. KAMMERER: It informs, but it  
25 certainly isn't sufficient in and of itself.

1 MEMBER STETKAR: Okay. Okay.

2 MS. KAMMERER: I think that is a very true  
3 statement. It just gives us a sense.

4 The walkdowns will provide information, of  
5 course, on the states of the plant and the degree that  
6 new issues have arisen related to plant changes. And  
7 we know there is going to be, we believe there is  
8 going to be a variety of --

9 MEMBER STETKAR: We are short on time, but  
10 this is your last slide. So, can I bring you back to  
11 the spent-fuel pool? Because the spent-fuel pool, the  
12 draindown thing is the only place in the current  
13 guidance that expands beyond Seismic Category 1 --

14 MS. KAMMERER: Right.

15 MEMBER STETKAR: -- beyond current  
16 licensing basis, if you will.

17 MS. KAMMERER: Right.

18 MEMBER STETKAR: And I want to make sure  
19 I understand what is intended at this stage versus  
20 what is intended regarding that issue in 2.1. I got  
21 clarification from you partially. I understand a  
22 little bit better what a rapid-draindown event may or  
23 may not be. But within the context of this walkdown,  
24 you said a rapid-draindown event, I think, is an event  
25 that does something, and I want to get back to

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1       whatever that something is, to top of active fuel  
2       within 72 hours.

3               Is that strictly draining level to the top  
4       of active fuel or is that a draindown event that could  
5       reduce inventory enough, such that, without  
6       intervention, you would uncover fuel within 72 hours?  
7       Because those are two different issues.

8               MR. CHOKSHI: Right.

9               MEMBER STETKAR: Do you want me to read  
10       the definition?

11              MR. CHOKSHI: Yes. No, I think you can  
12       read, but that is a good question. I will have to ask  
13       Dick Starck.

14              In that definition, did you look at the  
15       makeup capacity and be looking at the leak rates  
16       versus the rate of making up the capacity? Or you  
17       just looked at the loss of inventory as the question  
18       Dr. Stetkar asked?

19              MS. KAMMERER: We were assuming that there  
20       was no makeup, and we also noted that sloshing had to  
21       be accounted for.

22              MR. CHOKSHI: Oh, you did?

23              MS. KAMMERER: Yes.

24              MR. CHOKSHI: Okay.

25              MR. COOK: Because it says resultant

1 spent-fuel pool water inventory loss.

2 MEMBER STETKAR: But, for example, if you  
3 could drain down the spent-fuel pool to a foot or two  
4 above the top of active fuel within "X" hours, where  
5 "X" is much less than 72, and then boil off to the top  
6 of active fuel from the remaining two feet of  
7 inventory within that 72-hour period, is that  
8 something that would be identified as part of this  
9 particular walkdown?

10 MS. KEITHLINE: I think the answer is yes,  
11 because the way we were discussing it the other day,  
12 if we cannot show that we would not uncover the top of  
13 the fuel within 72 hours, and that would have to take  
14 into consideration sloshing and probably evaporation,  
15 but I think the bigger effects would be the water loss  
16 due to sloshing and then the leak rate, the draining-  
17 down due to structural failure, the way the definition  
18 currently is written, it says, "In this document, a  
19 rapid draindown refers to seismically-induced rapid  
20 draindown resulting in spent-fuel pool water inventory  
21 loss at a rate that could uncover the fuel within 72  
22 hours."

23 MEMBER ARMIJO: Without mitigation?

24 MS. KAMMERER: Without mitigation.

25 MS. KEITHLINE: And we assumed without

1 makeup.

2 MS. KAMMERER: We should add that.

3 MS. KEITHLINE: I think it is in the  
4 discussion.

5 MS. KAMMERER: Okay.

6 MEMBER STETKAR: Wait. I am still  
7 confused because that tells me a size of a hydraulic  
8 head --

9 MEMBER ARMIJO: It tells you how much  
10 water.

11 MEMBER STETKAR: -- or a hole with a  
12 hydraulic head to uncover fuel. I didn't hear  
13 anything about uncovering to within "X" feet above the  
14 top of the fuel with subsequent boiloff.

15 As a walkdown person, as a person  
16 performing this analysis, I could easily interpret  
17 those words as saying, how big a hole do you need to  
18 uncover the fuel, just water at the top of active  
19 fuel, strictly from loss of inventory within 72 hours?

20 MEMBER BLEY: Which requires a hole at or  
21 below --

22 MEMBER STETKAR: Which requires a hole at  
23 or below the top of active fuel, and very few plants,  
24 if any, have that. And they would all check off the  
25 box "We don't have this, so we don't need it."

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1           On the other hand, if there is a hole that  
2           can drain you down to within a foot or two of the top  
3           of active fuel and then boil off, I might identify  
4           some vulnerabilities if I think that way.

5           MR. CHOKSHI: Right.

6           MS. KEITHLINE: Right.

7           MEMBER STETKAR: So, I think understanding  
8           that concept --

9           MR. CHOKSHI: Yes, yes.

10          MEMBER STETKAR: -- might be important.

11          MR. CHOKSHI: But depending on, also, what  
12          fuel you have in the pool, it could affect --

13          MS. KEITHLINE: What I read was just the  
14          definition in the definitions appendix, but the  
15          guidance, actually, that we have put into Section 4 --  
16          but, unfortunately, we did this in just the last few  
17          days; we worked through this one -- is much more  
18          detailed.

19          MR. CHOKSHI: But that is a good -- we  
20          will look at it.

21          MEMBER STETKAR: Okay.

22          MS. KEITHLINE: I think we need to look at  
23          whether we have to include the word "evaporation" in  
24          addition to sloshing in here.

25          MS. KAMMERER: I think we should.

1 MS. KEITHLINE: Yes.

2 MS. KAMMERER: I think definitely. And I  
3 think we actually said that they really need to look  
4 if they were within 10 feet.

5 MS. KEITHLINE: Right.

6 MS. KAMMERER: But I think one of the  
7 things we recommended is, if they are starting to get  
8 into a lot of these questionable -- well, not  
9 questionable, but the complex calculations -- that  
10 they should just walk them down, right? I mean, we  
11 are recommending that, if it is even questionable, put  
12 it in your SWEL and walk it down.

13 MEMBER BLEY: There is something in what  
14 Mr. Stetkar talks through that I am not sure I heard  
15 coming back. And that is, there are some plants in  
16 the world that have pipe systems such that you  
17 wouldn't need a structural --

18 MR. CHOKSHI: Right.

19 MS. KAMMERER: Yes. That's right.

20 MR. CHOKSHI: A siphoning type of --

21 MS. KAMMERER: That's right.

22 MEMBER BLEY: Yes.

23 MR. CHOKSHI: Yes, and I think the  
24 question of boiloff, if you ever unloaded the core,  
25 boiloff could be pretty --



1 MS. KAMMERER: Yes.

2 MR. CHOKSHI: So, we need to look.

3 MS. KAMMERER: But we will add those.

4 MEMBER STETKAR: Because you are supposed  
5 to be addressing all operating modes, for example.

6 MS. KAMMERER: Yes.

7 MEMBER ARMIJO: Now I just want to make  
8 sure. In this case of the pools, we are still dealing  
9 with a design basis --

10 MR. CHOKSHI: Yes.

11 MEMBER ARMIJO: -- meeting the design  
12 basis?

13 MR. CHOKSHI: Yes.

14 MEMBER ARMIJO: So, you are not going to  
15 assume that there is a seismic event that structurally  
16 fails a pool?

17 MR. CHOKSHI: Right.

18 MS. KAMMERER: Yes. Although I would say  
19 that one of the challenges is that we are looking at  
20 any of the equipment that causes rapid draindown,  
21 regardless of whether it is Seismic Category 1 or --

22 MEMBER ARMIJO: I understand that part.

23 MS. KAMMERER: Because not all of that  
24 equipment is going to have a seismic design basis.

25 MR. CHOKSHI: No, but the hazard level is

1 the design basis, you are right.

2 MS. KAMMERER: Right. Oh, I'm sorry.

3 MEMBER STETKAR: It is the design basis,  
4 but some of those piping systems may not --

5 MR. CHOKSHI: Right, they may not --

6 MEMBER STETKAR: -- be designed to that  
7 hazard.

8 MR. CHOKSHI: Exactly.

9 MS. KAMMERER: Right.

10 MEMBER STETKAR: They may not be Seismic  
11 Category 1.

12 MS. KAMMERER: Right. Exactly. And so,  
13 in that case, those would need to be looked at with  
14 that specifically --

15 MEMBER STETKAR: As I can see, I think  
16 that is the only place -- and you can correct me --  
17 other than the seismic two-over-one issues --

18 MS. KAMMERER: That's right.

19 MEMBER STETKAR: -- that are generally  
20 addressed.

21 MS. KAMMERER: That's right.

22 MEMBER STETKAR: That is the only place  
23 where this guidance kind of expands out beyond --

24 MS. KAMMERER: That's right.

25 MEMBER STETKAR: -- Category-1-type

1 design-basis equipment.

2 MS. KAMMERER: Right. And we felt that  
3 that was necessary to make the objectives better.

4 Okay. I need to write "boiloff" before I  
5 forget.

6 CHAIR SCHULTZ: Before I ask the Committee  
7 members for any last comments before we adjourn the  
8 meeting, I would like to ask if there are any members  
9 of the public who would like to make comments to the  
10 staff or to the Committee.

11 (No response.)

12 MEMBER STETKAR: Do we have anybody on the  
13 bridge line? Do we know?

14 MR. WIDMAYER: It is not open right now.

15 MEMBER ARMIJO: Well, then, it is kind of  
16 hard for them to comment.

17 (Laughter.)

18 CHAIR SCHULTZ: Any comments from members  
19 of the public in the room?

20 (No response.)

21 While we are waiting for the bridge line,  
22 we will start the go-around from the Committee  
23 members.

24 Jack, any final comments?

25 MEMBER SIEBER: I have no additional

1       comments.

2                   CHAIR SCHULTZ:   Okay.   Dick?

3                   MEMBER SKILLMAN:   I do, one comment, the  
4       same that I made on the last presentation relative to  
5       the need for the CAP system --

6                   MS. KAMMERER:   Yes.

7                   MEMBER SKILLMAN:   -- to be known to be  
8       vibrant and effective.

9                   MS. KAMMERER:   Yes.

10                  MEMBER SKILLMAN:   Thank you.

11                  CHAIR SCHULTZ:   Dennis?

12                  MEMBER BLEY:   Yes, just a couple.   That  
13       issue of having operators on the walkdown is important  
14       I think.   The complete exclusion of structures, except  
15       for two-over-one, worries me a little, especially for  
16       buildings being very close together that individually  
17       would be no problem, but might have some interaction.

18                  The other thing that just sits a little  
19       funny, and it started with Armijo's question, how do  
20       you screen?   How do you pick out the things?   You  
21       started to say you thought about risk and that sort of  
22       thing, but you backed away from risk because this is  
23       a design study.

24                  On the other hand, you keep a little bit  
25       of risk.   I mean, you keep the division between

1 frontline support systems which came out of the risk  
2 studies. We never talked about that before. You look  
3 at these IPEEE changes.

4 I am a little dissatisfied that we don't  
5 have like a small subset of the things that are most  
6 important to risk mandatorily being in this catalog.

7 MS. KAMMERER: Oh, we had that in  
8 originally. We had that in originally.

9 MEMBER BLEY: Yes, and that leaves me a  
10 little uncomfortable. The thing that might talk me  
11 past it -- and I have to think about it more -- is the  
12 philosophy of your screening to be broad, cover many  
13 things, may cover us. But if we find anything that is  
14 not meeting the design basis in this small sample out  
15 of everything that is there, that ought to trigger a  
16 much more thorough look, and especially a look at the  
17 things that are, in fact, most important to safety.

18 MR. CHOKSHI: Yes. In fact, the existing  
19 programs like CAP and things require that sort of --  
20 when you find something, then you need to go to look  
21 at similar situations. So, that is what will trigger,  
22 if they find something which is particularly  
23 noncompliant conditions.

24 MS. KAMMERER: Yes, and I think getting  
25 back to the comment just a minute ago on the CAP, this

1 is something that we are going to have to, I think, be  
2 really involved with followup. Again, we are asking  
3 the resident inspectors -- you know, usually, they do  
4 sort of a spot-check on it -- to look at all of the  
5 equipment as it goes through that process and to keep  
6 an eye on that.

7 And also, for us, as we go through this  
8 process and develop the lessons learned and the  
9 closeout of it -- because, of course, one of the  
10 things, in addition to the TI, is our own staff review  
11 procedures, which are the next thing we have to  
12 develop. And I think really incorporating all of  
13 that, both understanding the risk-informed risk  
14 implications and any extension and really  
15 understanding do the existing procedures work or not  
16 work is a potential really important area of the  
17 lessons learned to come out of this project and  
18 program.

19 MEMBER SKILLMAN: I think that there is a  
20 link there that you will find between effective  
21 implementation of CAP and effective implementation of  
22 the work management program.

23 MS. KAMMERER: There is.

24 MEMBER SKILLMAN: Those two are just  
25 absolutely critical. Stations that handle those

1 programs well are normally extremely-well-run plants,  
2 and plants that have those two disconnected often  
3 stumble.

4 CHAIR SCHULTZ: Harold?

5 MEMBER RAY: Well, I think the chances of  
6 there being a misunderstanding about what we are doing  
7 here is approaching 100 percent.

8 (Laughter.)

9 And I don't question the value and  
10 necessity, because it is something that can be done  
11 reasonably quickly, of verifying that there aren't  
12 unrecognized deficiencies in the plants versus their  
13 design. And this I think will do that.

14 But the likelihood that it will be  
15 misunderstood as more than that is what concerns me.  
16 I just don't know how to deal with that. Because,  
17 very often, we have said, oh, well, we just want to  
18 have to do this once. Well, it is not clear to me how  
19 the heck you could -- on the flooding it is a little  
20 easier perhaps because water seeks its own level --  
21 but on seismic it is not clear to me at all how you  
22 don't do more than just the limited verification that  
23 this I think is intending, and data-gathering that  
24 this is intended to provide.

25 I am afraid that it will be misunderstood

1 not only by the licensees who have an interest in  
2 misunderstanding it -- (laughter) -- but by our own  
3 people in the field as to what the heck it is we are  
4 doing here.

5 I don't think time really allows us the  
6 luxury of trying to clarify it. So, I will just make  
7 that observation for the record and let it go.

8 CHAIR SCHULTZ: Sam?

9 MEMBER ARMIJO: Yes, I think the programs  
10 are pretty good as they are laid out. But it just  
11 seems to me that the sampling is very small. I would  
12 hope that the industry, or maybe within as you review  
13 the information, as information starts to come out  
14 from one type of plant, let's say BWR-IVs with Mark 1  
15 containments, someone defines a problem in his  
16 particular plant, that the message wouldn't get out to  
17 the rest of the people doing these walkdowns to see if  
18 they would double-check to see if it is extent of  
19 condition or whatever it is, that it is not just a  
20 plant-unique thing. I still think there should be  
21 some minimal set of required things that get looked  
22 at, but that is just a preference.

23 As far as the pools, unless there is some  
24 particular reason, you know, unique thing, a piping  
25 system, a siphon, or something, I just think we are



1 spending an inordinate amount of time on the spent-  
2 fuel pools under design-basis conditions.

3 Now, beyond design-basis conditions, there  
4 could be a different story. But with design-basis  
5 conditions, I just don't know why we are looking at  
6 it, at the structural integrity of the pools or  
7 assuming that they are not adequate right now. So,  
8 that is a confusion to me.

9 That is just a comment. That is an  
10 observation. It is not a recommendation. That's all.

11 (Laughter.)

12 That's all I have.

13 CHAIR SCHULTZ: John?

14 MEMBER STETKAR: Most of the things I  
15 think I have said. Just one thing, please, on the  
16 flooding stuff, look at that NUREG-1852 because that  
17 is the place where this process is, indeed, actively  
18 taking credit for the feasibility of personnel  
19 performing things, and we ought to look at that.

20 I am assuming, but I am not sure, if  
21 similar analyses are performed in the area of spent-  
22 fuel pool cooling, look at that also.

23 MR. CHOKSHI: Okay.

24 MEMBER STETKAR: I don't know that it is  
25 or not from what I understand.

1 MS. KAMMERER: Yes.

2 MEMBER STETKAR: I agree with Dennis; I  
3 feel kind of uneasy about the process of selecting the  
4 stuff for SWEL 1 and 2. One let's call it. It seems  
5 that it ought to have some notion of risk significance  
6 in it, but I understand your constraints. If you  
7 resurrect that notion, please look at things like  
8 Fussell-Vesely and Risk Achievement Worth, not just  
9 the top cutsets that did show up.

10 MR. CHOKSHI: Right.

11 MEMBER STETKAR: Because something that  
12 might have been optimistically-assigned you wouldn't  
13 see. But it would appear with a Risk Achievement  
14 Worth, for example. If you did that type of analysis,  
15 it would boil up from the surface.

16 MEMBER SHACK: But they have done that  
17 already. I mean, they have that kind of information.  
18 They could use it, if they chose to.

19 MEMBER STETKAR: That is the surprising  
20 thing, yes.

21 MEMBER SHACK: That is why, for example,  
22 I suggested it. Apparently, there has been pushback  
23 on it.

24 MR. CHOKSHI: Yes, we had it and we  
25 debated quite a bit.

1                   MEMBER STETKAR: One last comment I will  
2                   make because of time. I do agree with Harold that  
3                   perhaps not in these guidances because it is not the  
4                   point of this guidance, but there needs to be some  
5                   better clarity about the interface between these  
6                   walkdowns to satisfy the requirements of  
7                   Recommendation 2.3 and what they do accomplish and  
8                   what they don't accomplish going forward to  
9                   Recommendation 2.1, because that is a bit fuzzy right  
10                  now. I don't think you can do that within this  
11                  guidance, but somewhere there needs to be some clarity  
12                  on that, so there is no confusion.

13                 MR. CHOKSHI: Maybe we will pick that up  
14                 on 2.1, right?

15                 MS. KAMMERER: Yes. Yes, because, I mean,  
16                 it is true that people, when they talk about IPEEE,  
17                 are very confused about what it is and what it wasn't.  
18                 I mean, there is definitely that risk here,  
19                 definitely.

20                 CHAIR SCHULTZ: Mike?

21                 MEMBER RYAN: I would just second that  
22                 comment. I think that is a principal risk to this.  
23                 I always ask two questions. Why am I doing this and  
24                 when am I done?

25                 (Laughter.)

1           And if I get those two answers with  
2           clarity, I am in business. If I get them with no  
3           clarity, I am going to do a lot of work and maybe a  
4           small amount of it is going to be useful toward the  
5           ultimate goal.

6           So, I take away, as a non-expert in this  
7           area but certainly paying attention to these  
8           conversations, that there is a risk of that happening.  
9           I won't know when I am done and I won't know why I am  
10          doing it until I find out that I haven't done the  
11          right stuff.

12          I think John and others have given  
13          examples of how that might happen. And it is to not  
14          be complimentary of the work you have done so far, but  
15          now that you have got the body of the program kind of  
16          laid out, testing it maybe it once or twice with  
17          volunteers or somehow, to see how we can apply it with  
18          kind of a no-harm/no-foul sort of setup. If it is a  
19          learning experience and it creates a better system for  
20          everybody, maybe that is an opportunity to have an  
21          improvement. So, I just offer that thought.

22                 Thank you, Mr. Chairman.

23                 CHAIR SCHULTZ: Bill?

24                 MEMBER SHACK: No further comments.

25                 CHAIR SCHULTZ: Joy?

1 MEMBER REMPE: No comments, except that I  
2 appreciated them kind of explaining the competing --

3 CHAIR SCHULTZ: Derek, did we have any  
4 members of the public on the bridge line?

5 MR. WIDMAYER: It is open. I don't know  
6 if anybody is still there.

7 CHAIR SCHULTZ: It is open? Any members  
8 of the public who would like to make a comment?

9 (No response.)

10 Hearing none, I would certainly like to  
11 thank the staff for the presentations this morning,  
12 but, more so, thank you for the level of effort that  
13 you have put in over the last several months. We have  
14 heard about the public interaction that has happened  
15 through the meetings that you have held, and I am  
16 quite impressed by it, and I am sure the rest of the  
17 Committee is also.

18 We would encourage you to continue that  
19 diligence over the next several months as well. I  
20 don't know if that is what you want to hear --  
21 (laughter) -- but that is what we would like you to  
22 hear.

23 Again, we really congratulate you and  
24 appreciate the effort that you have all put in related  
25 to this important effort.

1 MEMBER SHACK: 2.1 ought to be so much  
2 easier.

3 (Laughter.)

4 MS. KAMMERER: Yes, theoretically.

5 MR. COOK: There is a team of people  
6 behind us who is doing this.

7 MS. KAMMERER: Yes.

8 MR. COOK: There is a team that is here  
9 that helped us.

10 CHAIR SCHULTZ: Thank you very much.

11 And hearing no additional comments, I will  
12 adjourn the meeting.

13 (Whereupon, at 12:17 p.m., the meeting was  
14 adjourned.)

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# ***Filtered Containment Venting Systems***

Briefing to the  
Advisory Committee on Reactor Safeguards  
May 22, 2012

# ***Topic Agenda***

- Background
- Steering Committee Tasking
- Foreign Experience with FCVS
- Stakeholder Input



# ***Background***

- In SRM-SECY-11-0137, the Commission directed the staff to take certain actions related to reliable hardened vents.
  - Supported the NTTF recommendation to pursue an order to include a reliable hardened vent in BWR Mark I and Mark II containments (Tier 1).
  - Perform a long-term evaluation on reliable hardened vents for other containment designs (Tier 3).
  - “...quickly shift the issue of ‘Filtration of Containment Vents’ from the ‘additional issues’ category and merge it with the Tier 1 issue of hardened vents for Mark I and Mark II containments...”

# ***Background***

- In response, SECY-12-0025 included:
  - Proposed order to require a reliable hardened vent for BWR Mark I and Mark II containment designs
    - Prevention of core damage
    - No requirements for severe accident service
  - Severe accident service and filtration treated as a separate issue from proposed order
  - July 2012 Commission Paper

# ***Staff Actions***

- Reliable Hardened Vent Order issued March 12, 2012
- Staff is currently reviewing issues relating to severe accident service and filtration
  - Review Past Regulatory Actions
  - Insights from Fukushima
  - Evaluate Under Existing Regulatory Framework
  - Foreign Experience Insights

# ***Foreign Experience with FCVS***

## ***Organizations and Sites Visited***

- Sweden
  - Swedish Radiation Safety Authority (SSM)
  - Forsmark Unit 2 (Vattenfall) – similar to Mark II
  - Ringhals Unit 1 (Vattenfall) – similar to Mark II
- Switzerland
  - Swiss Federal Nuclear Safety Inspectorate (ENSI/HSK)
  - Leibstadt (KKL) – Mark III
  - Mühleberg (BKW) – similar to Mark I

# ***Foreign Experience with FCVS***

## ***Sweden – Regulatory and Technical Bases***

- In response to TMI, Sweden issued “Report by the Swedish Government Committee On Nuclear Reactor Safety”
  - Mitigate the consequences of a severe accident by strengthening containment.
  - Reduce risks that could result in radiation fatalities or high radiation dose from ground contamination
- FILTRA Research Project – a joint regulator and industry effort

# ***Foreign Experience with FCVS***

## ***Sweden – Regulatory and Technical Bases***

- Energy Bill 1980/1981
  - Expedite FCVS for Barseback (Located near Copenhagen)
  - Consider FCVS for Forsmark, Ringhals and Oskarshamn and identify any alternatives to FCVS
  - Cost/benefit not applicable to ground contamination
- Outcome
  - Barseback “First-of-a-kind” FCVS (1980 – 1985)
  - “Second Generation FCVS” for Forsmark, Ringhals and Oskarshamn

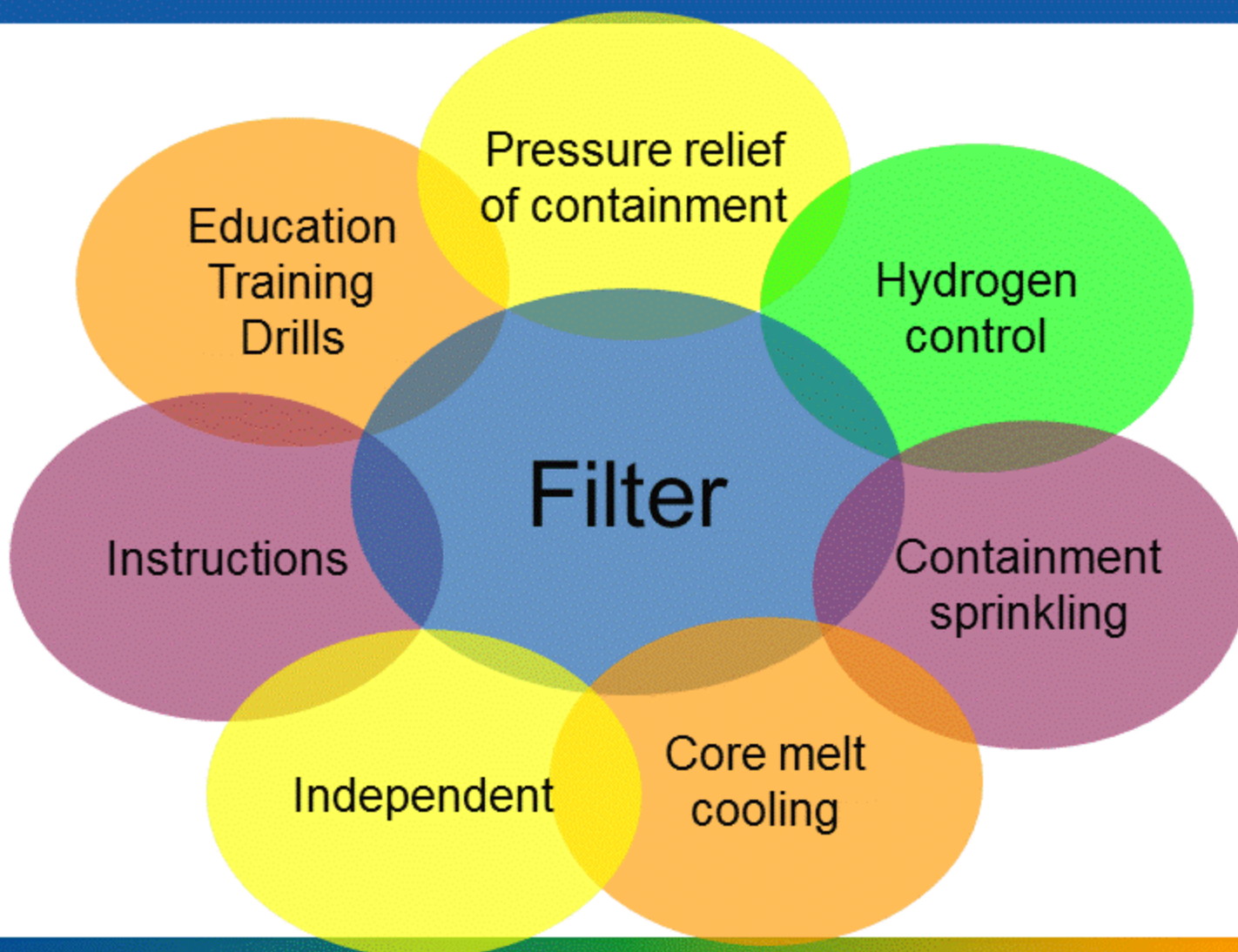
# ***Foreign Experience with FCVS***

## ***Sweden – BWR FCVS at Ringhals 1, Forsmark and Oskarshamn***

- Regulator and industry alignment to thoroughly evaluate ways to strengthen containment
- SSM required defense-in-depth for acknowledged uncertainties in PRA
  - FCVS from drywell was required for slow over-pressurization, feed/bleed and flood up by additional independent containment spray
  - Reliable drywell spray to flood up containment
  - Reliable means to flood under pedestal
  - Separate early overpressure mitigation



# Concept





# ***Foreign Experience with FCVS***

## ***Sweden – FCVS DF Requirements***

- No acute fatalities
- Limited area of first year dose from ground contamination (with rain) of greater than 50 mSv
  - 5 Rem, natural background in some areas of Europe, annual radiation worker dose
- Considered met if release of no more than 0.1% core inventory Cs-134, Cs-137, and Iodine of 1,800 MWth reactor, similar for other nuclides important to land contamination
- Required demonstrated minimum DF 100; MVSS designed for 500, tested at 1,000

# ***Foreign Experience with FCVS***

## ***Sweden – BWR FCVS Design Summary***

- Passive filter, inerted w/ N<sub>2</sub>, achieved DF of 1,000.
- Heat removal capability 1%, vents hydrogen.
- Seismic design – same as containment.
- Single train, 24 hour passive operation, active operation for early venting.
- Valves operable from control room with independent electrical and pneumatic supplies. Forsmark has local manual operation from shielded station.
- Instrumentation with independent batteries
- Drywell connection

# Foreign Experience with FCVS



Top right to left, containment penetration, seismic support, inboard low pressure early venting line.  
Lower right to left – penetration, passive rupture disk, 2 normally open valves.

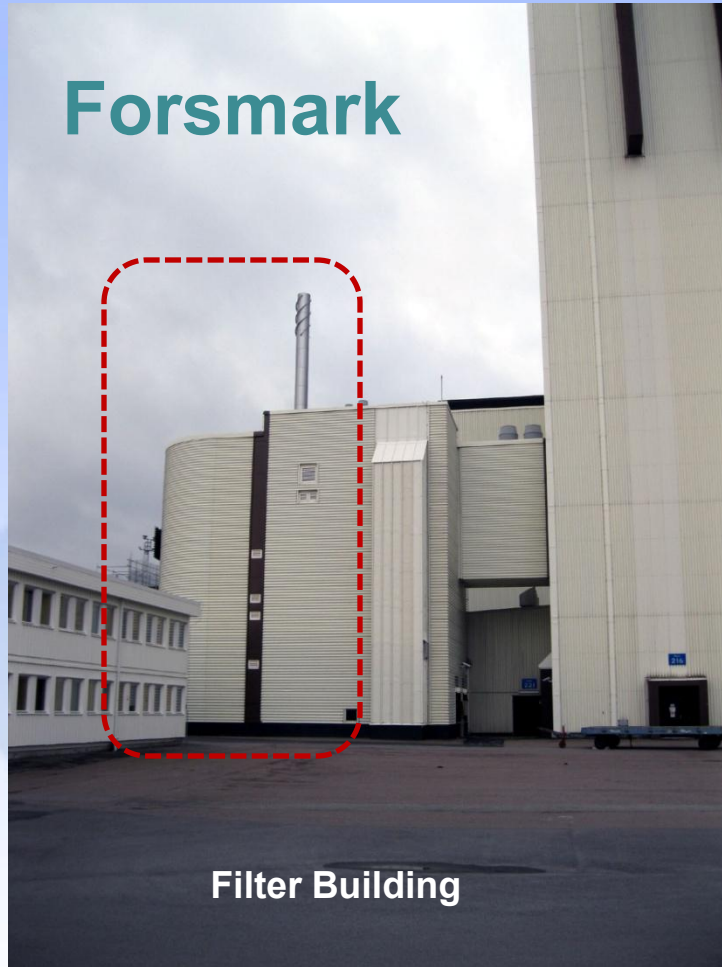


Local manual pneumatic supply operating station for containment vent valves and system inerting.

**Forsmark**

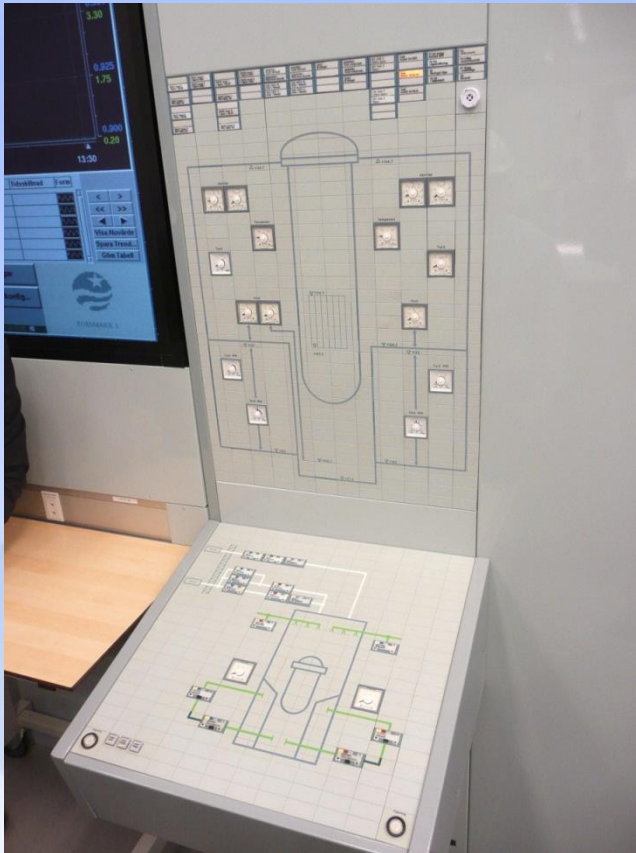


# *Foreign Experience with FCVS*



# Foreign Experience with FCVS

## Forsmark



**Control Room Panel for FCVS,  
Under-Vessel Flooding System  
and Spray Controls**



**Containment Flooding System  
Temporary Equipment Connections.**

# Foreign Experience with FCVS

## Ringhals



**Mobile Unit for  
Containment Spray  
and PMR (Electrical  
System Power)**





# ***Foreign Experience with FCVS***

## ***Sweden – BWR FCVS Industry Experience***

- Final SSM guidance 1986 – all required backfits, including FCVS, completed 1988
- Majority of work done at power, used outages for tie-in with no impact on production
- FCVS installation considered “not difficult”
- Installation costs (1988) estimated \$12.5 million per unit at Forsmark; Approximately \$9 million per unit at Ringhals
- Annual maintenance, testing, inspection not significant - estimate \$10,000-\$30,000
- FCVS in technical specifications; 30-Day AOT
- FCVS mature technology, no safety issues with use
- Utility representatives considered FCVS cost-beneficial

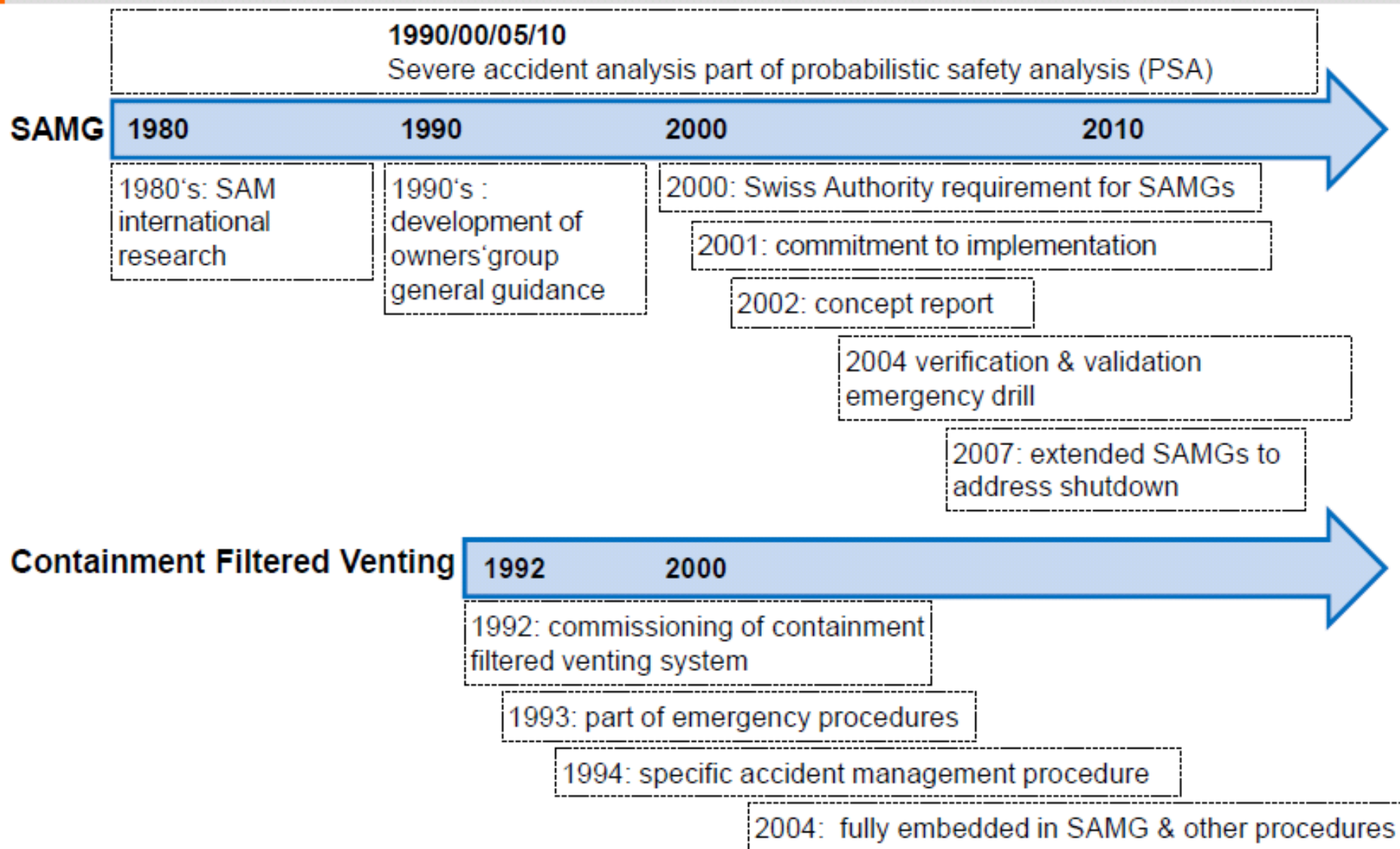
# ***Foreign Experience with FCVS***

## ***Switzerland – FCVS Regulatory and Technical Bases***

- Swiss Nuclear Energy Act requires licensees to backfit, as appropriate, in response to operating experience and consistent with available technology, to further reduce risk to people and the environment.
- Following TMI Swiss plants were required to install severe accident mitigation systems (e.g., SUSAN at Mühleberg).
- In response to the Chernobyl accident in 1986, HSK requested licensees to evaluate FCVS.



# Accident Management & Containment Filtered Venting Timeline (example Mühleberg)

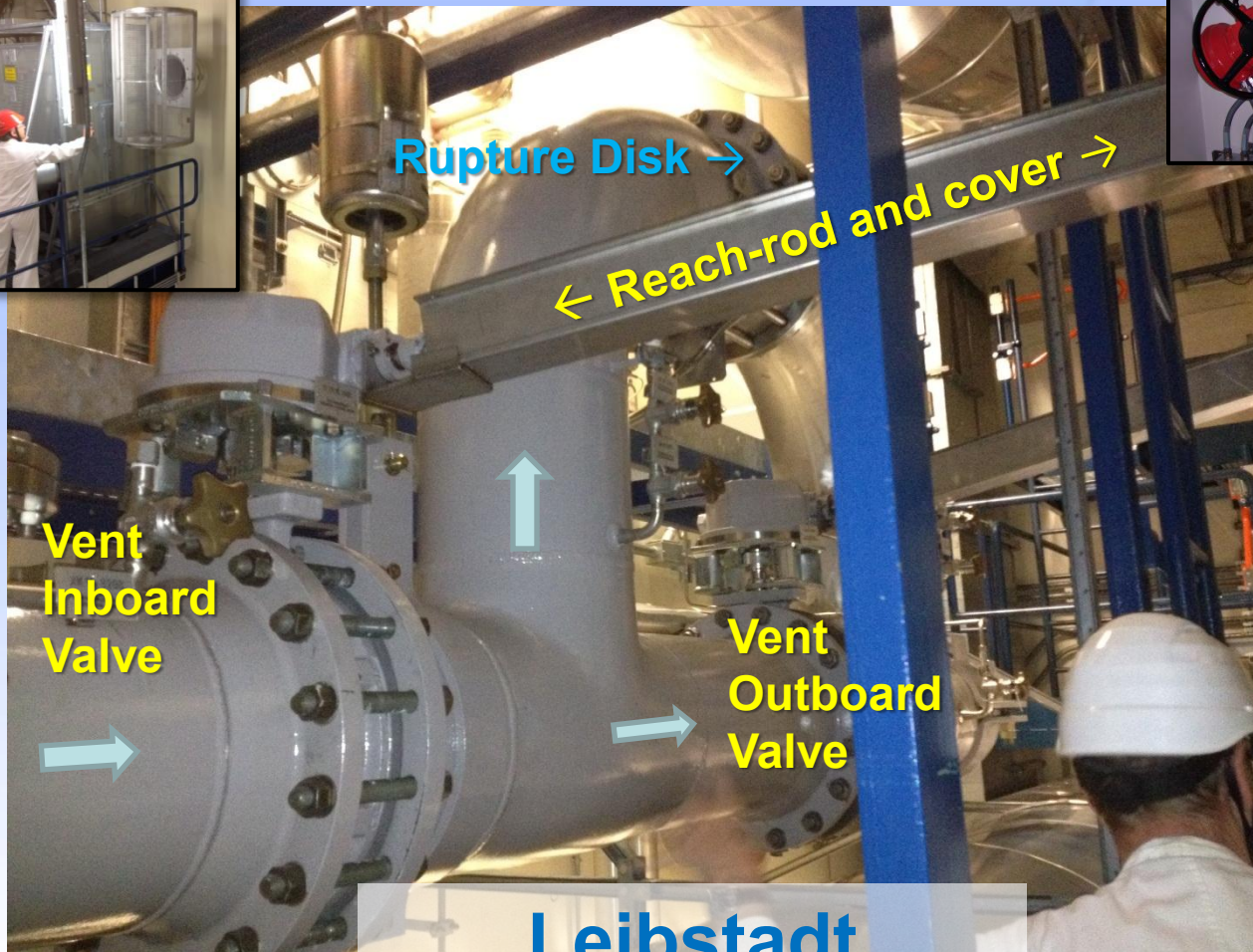


# ***Foreign Experience with FCVS***

## ***Switzerland – FCVS Regulatory and Technical Bases (continued)***

- HSK deterministic decision on FCVS based on need for defense-in-depth
- Regulator/industry developed draft guidance by 1988; installation 1989-1993; final regulatory guideline HSK R-40 1993
  - Heat removal capacity - 1% thermal power
  - Passive actuation via rupture disc; 24 hours
  - Operation from control room and manual local
  - Dedicated power for instrumentation and valve operation
  - Seismic Class 1
  - DF of 1,000 for aerosols, 100 for elemental/organic iodine (based on available technology)

# Foreign Experience with FCVS



**Leibstadt**

(BWR-6, MK-III, ~1200 MWe)



# ***Foreign Experience with FCVS***

## ***Switzerland – FCVS Industry Experience***

- Leibstadt - \$11 million in 1993
- Mühleberg \$6 million in 1990 excludes filter vessel (not needed because MVS in unique secondary containment suppression pool)
- Majority of installation work performed at power, used outages for tie-in with no impact on production
- Maintenance Costs Considered “Not significant”
  - Estimated at \$50,000 to \$100,000/year
- Adopting new chemistry to improve iodine retention
- FCVS in Technical Specifications; 10-Day AOT
- No stated negatives for FCVS – Utility Representatives considered FCVS Cost-beneficial as designed

# ***Foreign Experience with FCVS***

## ***Summary***

- Mitigation of Severe Accidents required in Sweden and Switzerland
- FCVS required to preserve containment function
- No technical difficulties to install and maintain FCVS
- Counterparts emphasized that the installations did not extend scheduled refueling outage times
- Completed within 2 to 3 years
- FCVS considered cost-beneficial as designed

# ***Stakeholder Input***

- Public meetings held May 2nd and May 14th
- Nuclear Energy Institute letter May 25, 2012
- Public is very engaged – over 5 hours of input and comments received during public meetings.

# ***Next Steps for FCVS Decision***

- Staff Actions
  - Assess results of RES analyses of Fukushima
  - Finalize options and recommendations
  - Consider stakeholder input
  - Japan Lessons Learned Steering Committee review and approval
- ACRS Review
- July 2012
  - Response to Commission SRM due
  - SECY Paper to the Commission with options and staff recommendations

# ***NTTF Recommendation 5.2: Reliable Hardened Vents for Other Containment Designs***

Briefing to the  
Advisory Committee on Reactor Safeguards  
May 22, 2012



# ***Background***

- The NTTF recommended that the Commission direct the staff to reevaluate the need for hardened vents for other containment designs (other than BWR Mark I and Mark II containments)
- Prioritized as Tier 3 in SECY-11-0137
- Commission agreed with Tier 3 prioritization

# ***Staff Assessment - Recommendation 5.2***

- Historically, concern with containment venting has been on Mark I and II containment designs.
- Mark I and II designs are susceptible to over-pressurization if a means to remove heat from containment are lost.
- Other containment designs are less susceptible to over-pressurization.

# ***Staff Assessment - Recommendation 5.2 (cont'd)***

- There are limited resources (staff with specialized expertise) in this area.
- Staff recommends that further consideration of venting for other containment designs be deferred.
- Consideration of hardened reliable vents for other containment designs will resume when issues for Mark I and II designs are resolved.



Dr. Nilesh Chokshi  
Dr. Christopher Cook  
Dr. Annie Kammerer

## ACRS Meeting

May 22, 2012

# **NTTF Recommendation 2.3: Flooding and Seismic Walkdowns**



# **Overview and Development of R2.3 Walkdown Guidance**

# Background

- SECY-12-0025
  - Enclosure 7 contains the draft 50.54(f) letter
  - SRM-SECY-12-0025 issued on March 9, 2012
- Issuance details for the 50.54(f) letters
  - Letters sent on March 12, 2012
  - Addresses include all operating power reactor licensees
  - COL and CP holders do not need to perform walkdowns
  - Walkdowns are Enclosure 3 (seismic) and Enclosure 4 (flooding) of each 50.54(f) letter

# General Considerations

- Purpose
  - Walkdowns are to gather information “in the interim period until longer term actions are completed to update the design basis for external events” (pg 30, Recommendation 2.3, NTTF Report)
  - Degraded, nonconforming, or unanalyzed conditions will be addressed through the licensee’s Corrective Action Plan (CAP)
  - Walkdown methodology and acceptance criteria to be developed by licensees and endorsed by NRC staff

# 50.54(f) Letter Timeline

- **Now**
  - Numerous public meetings held
  - Industry (via NEI) to submit separate guidance documents for seismic and flooding walkdowns
- **May 31, 2012**
  - Anticipated date NRC would endorse the walkdown guidance by May, 2012
- **June 10 (flooding); July 10 (seismic)**
  - Each licensee confirms guidance to be used
- **~Nov 27, 2012 (180-days after NRC endorsement)**
  - Licensees submit walkdown reports including a list of any inaccessible areas (& completion dates)



# Related Activities

- Temporary Instruction (TI)
  - TI 2515/187: Flooding Walkdowns
  - TI 2515/188: Seismic Walkdowns
  - Objective is for NRC Inspectors to independently verify that the licensee's walkdowns are conducted using the guidance methodology.
  - TI is initiated in accordance with licensee's walkdown schedule, and is closed when the inspection is complete.

# Flooding Walkdowns

# Lessons from the Past

- **NUREG-1742: IPEEE HFO reports**
  - HFO walkdown submittals did not provide detailed descriptions of the walkdown procedures and results
  - “A few licensees proposed flood-related countermeasures that may be optimistic”
  - Submittals did not discuss confirmatory testing to verify effectiveness of flood-related countermeasures.
- **INPO SER 1-01: 1999 Le Blayais flood event**
  - Cable openings and trenches were a common-mode vulnerability requiring review
  - Flood’s effect on support functions and surrounding areas were not adequate or were inappropriate for the weather conditions

# Lessons from the Past

- NRC Temporary Instruction 2515/183
  - April/May 2011 (post-Fukushima) walkdowns for all operating power reactors.
  - TI evaluated each licensee's capability to mitigate external flooding required by station design
  - NRC's summary: "potential trend of failure to maintain equipment and strategies to mitigate some design basis...events"
- Insights from Fort Calhoun 2011 events
  - Flood event duration was approximately 84 days
  - Entire duration of the flood-hazard event should be considered with reviewing protection equipment and procedures

# NEI Guidance Document

1. Introduction
2. Purpose
3. Definitions
4. Scope
5. Walkdown Methodology
6. Acceptance Criteria
7. Evaluation and Reporting of Results
8. References

## Appendix

- A. Examples on Inspection Considerations
- B. Walkdown Record Sheet [used onsite]
- C. Sample Training Content
- D. Walkdown Report [to NRC]

# Overarching Considerations

- Licensees will verify that the following will perform their design functions as credited in the CLB:
  - Permanent structures, systems, components
  - Temporary/portable flood mitigation equipment
  - Procedures needed to install and/or operate the flood mitigation equipment
- Licensees will also verify that :
  - Changes to the plant (e.g., security barrier installations and topography changes) do not adversely affect flood protection.
  - Execution of procedures will not be impeded by adverse weather conditions that could be reasonably expected to simultaneously occur

# Deficiency

For this guidance, a deficiency exists when:

- a flood protection feature is unable to perform its intended flood protection function when subject to a design basis flooding hazard.
- Walkdown observations that may be potential deficiencies will be evaluated in accordance with station processes and entered into the licensee's Corrective Action Program (CAP)
- Observations that are determined by the CAP to be deficiencies are reported to the NRC in the Walkdown Report.

# Flood Protection Features

For this guidance, flood protection features include:

- incorporated, exterior and temporary structures, systems, and components (SSCs) and applicable procedures that are credited to protect against or mitigate the effects of CLB external floods.
- Guidance follows RG1.102 definitions for incorporated, exterior, and temporary flood protection features.
- These features can have either an active (pumps, valves, level switches) or passive (dikes, berms, sumps, drains) function.



# Reasonable Simulation

For this guidance, a reasonable simulation is a:

- walk-through of a procedure or activity to verify the procedure or activity can be executed as specified/written.
- Reasonable simulation verifies that:
  - Resources are available, including aggregate effects
  - Credited time-dependent activities can be completed
  - Equipment/tools are properly staged
  - Execution of the activity will not be impeded by the event (i.e., site access and movement)
  - Execution of the activity will not be impeded by adverse weather conditions
  - Training is provided for the activity

# Visual Inspection

For this guidance, a visual inspection is a:

- visual comparison of the physical condition of a flood protection structure, system, or component (SSC) to acceptance criteria.
- In the limited situations where a flood protection feature cannot be visually inspected, it will be categorized as in either a “restricted access” or “inaccessible” area

# Restricted Access

For this guidance, restricted access areas are:

- areas that are not normally accessible for direct visual inspection.
- Items classified as “restricted access” will be identified in the 50.54(f) response letter
- Justification for delaying the walkdown shall be provided along with a schedule for when walkdown accomplished

# Inaccessible

For this guidance, inaccessible areas are:

- areas that cannot reasonably be inspected due to significant personnel safety hazard, very high radiation areas, or no reasonable means of access (e.g., buried).
- Items classified as “inaccessible” will be identified in the 50.54(f) response letter
- Justification will be provided that there is reasonable assurance that the feature is available and will perform the external flood protection or mitigation function for the full duration of the flood condition

# Variety of Site Conditions

During the walkdowns, the variety of site conditions considered in the CLB will be reviewed including:

- Modes of plant operation (e.g., full power operation, startup, shutdown, and refueling)
  - Adverse weather conditions that could reasonably be expected to simultaneously occur.
- 
- Walkdowns will verify that all flood protection features and procedures are available, functional, and implementable under a variety of site conditions as assumed in the CLB

# Flood Duration

For this guidance, flood duration is:

- The length of time in which flood conditions exist at the site as assumed in the CLB.
- Walkdowns will consider the effects that could occur over the entire flood duration, including:
  - Site and building access
  - Travel around the site
  - Equipment operating time
  - Supplies of consumables

# Cliff-Edge Effects

- Defined by the NTTF Report, which noted that “the safety consequences of a flooding event may increase sharply with a small increase in the flooding level” (NTTF Report pages 29, 36, 37)
- The staff used the same term as the NTTF Report in the 50.54(f) letter, however the information staff expects to obtain following the R2.3 walkdowns is different than following the R2.1 evaluations

# Available Physical Margin

- Staff now differentiates between cliff-edge effects (which are dealt with in R2.1) and a new term, available physical margin (APM).
- The APM for each applicable flood protection feature is the difference between licensing basis flood height and the flood height at which water could affect an SSC important to safety
- APM is determined by measurement, with a resultant value of length...versus...Cliff-Edge Effect is determined by analysis, with a resultant determination of the safety consequence(s).



# Available Physical Margin

- APM values will be collected during both visual inspection and reasonable simulation portions of the walkdowns
- All APMs with small margin that could result in loss of safety function will be entered into the CAP
- APM information will be retained onsite and available for inspection and audit

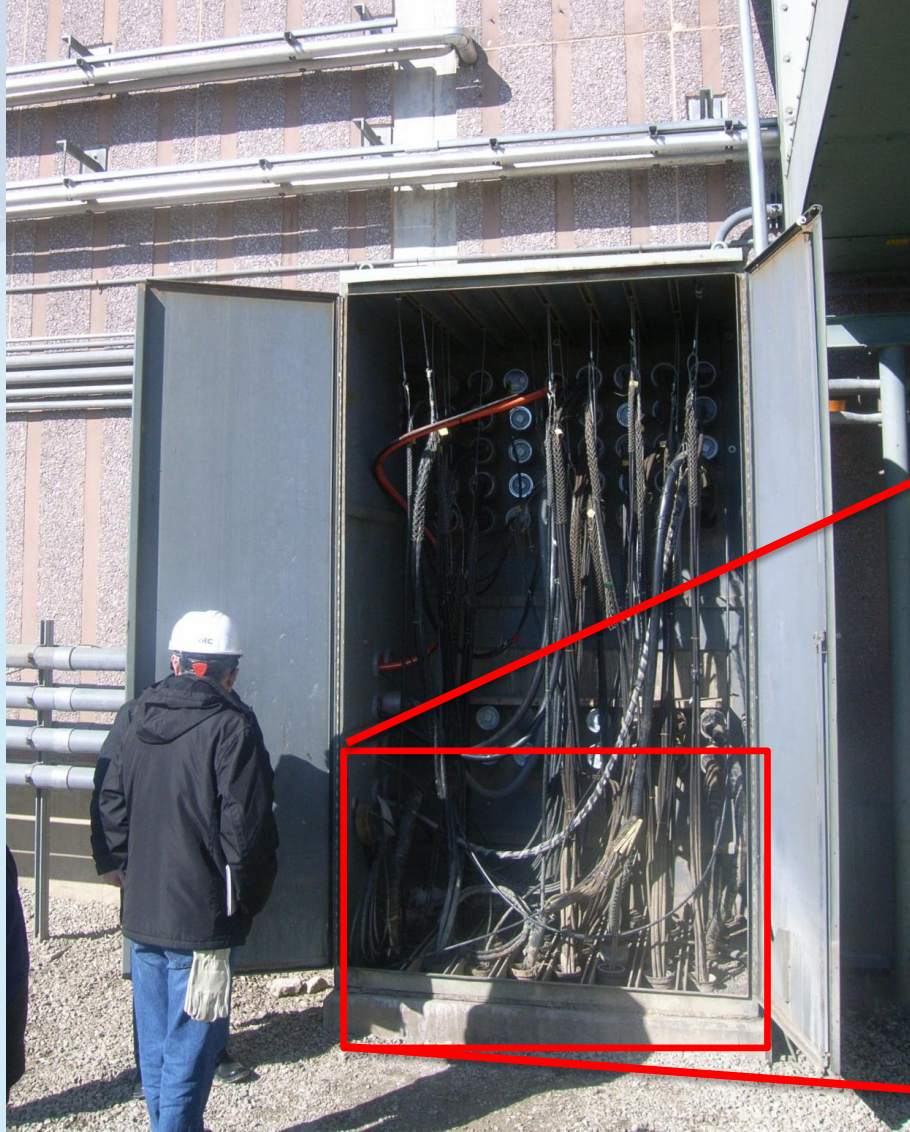
# Available Physical Margin

**temporary flood gate with inflatable gasket seals to protect against external flooding**





# Available Physical Margin



**cable penetrations that enter  
Cat 1 safety-related structures**



# Training and Qualifications

- Personnel selected to perform the walkdown inspection activities must be experienced and knowledgeable
- Different sections of the flooding walkdown record form require different knowledge/experience areas:
  - Current flooding licensing basis
  - Flood protection features
  - Plant operations
  - Flooding protection procedures

# Training and Qualifications

- Training requirements for each section of the Walkdown Record Form are provided in NEI's guidance document in Section 5.3 and Appendix C
- Training modules are being developed by INPO
- Responsibility of each licensee to document how assigned individuals meet all experience and knowledge requirements
- Signatures on walkdown record sheets document individuals performing the inspection. Record sheets will be retained onsite and available for inspection and audit.

# Walkdown Report

- Appendix D of NEI's Guidance repeats and expands on each 50.54(f) reporting item
- Reported items include description of:
  - walkdown guidance (including exceptions), team organization and training.
  - CLB flood level, flood action levels, credited warning time, site drainage plan
  - flood protection and mitigation features
  - variety of site conditions considered in CLB (modes of operation and adverse weather conditions)
  - all deficiencies as determined by CAP
  - any actions taken or planned to address deficiencies or enhance flood protection



# Informing Recommendation 2.1

- Walkdowns are to gather information in the interim period until R2.1 actions are completed.
- During the R2.1 integrated assessment, the cliff-edge effects and the associated safety risks will be determined.
- R2.1 integrated assessment will use the APM as well as other information, such as the specific SSCs that are subjected to flooding and the potential availability of other systems to mitigate the risk.

# Seismic Walkdowns





# Thank You

## **Overview and Development of R2.3 Seismic Walkdown Guidance**



**U.S. NRC**

UNITED STATES NUCLEAR REGULATORY COMMISSION

*Protecting People and the Environment*

# **Japan Lessons Learned Tier 3 Regulatory Actions**

**ACRS Meeting of the Fukushima  
Subcommittee**

**Rockville, Maryland**

**May 22-23, 2012**

# Initial NRC Actions In Response to Fukushima

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF NEW REACTORS  
OFFICE OF NUCLEAR REACTOR REGULATION  
WASHINGTON, DC 20555-0001

March 18, 2011

NRC INFORMATION NOTICE 2011-05: TOHOKU-TAIHEIYU-OKI EARTHQUAKE EFFECTS ON JAPANESE NUCLEAR POWER PLANTS

**ADDRESSEES**

All holders of or applicants for operating licenses for nuclear power reactors under the provision of Title 10 of the Code of Federal Regulations (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities," except those who have permanently ceased operations and have certified that fuel has been permanently removed from the reactor vessel.

All holders of or applicants for a standard design certification, standard design approval, manufacturing license, limited work authorization, early site permits or combined license issued under 10 CFR Part 52, "Licenses, Certifications and Approvals for Nuclear Power Plants."

**PURPOSE**

The U.S. Nuclear Regulatory Commission (NRC) is issuing this information notice (IN) to inform addressees of effects of the Tohoku-Taiheiyou-oki Earthquake on nuclear power plants in Japan. The NRC expects that recipients will review the information for applicability to their facilities and consider actions, as appropriate, to avoid similar problems. Suggestions contained in this IN are not NRC requirements, therefore, no specific action or written response is required.

**DESCRIPTION OF CIRCUMSTANCES**

The following summary of events is provided based on the best information available at this time. The situation in Japan regarding recovery efforts for the Fukushima Daiichi Nuclear Power Station continues to evolve on an hourly basis.

On March 11, 2011, the Tohoku-Taiheiyou-oki Earthquake occurred near the east coast of Honshu, Japan. This magnitude 9.0 earthquake and the subsequent tsunami caused significant damage to at least four of the six units of the Fukushima Daiichi nuclear power station as the result of a sustained loss of both the offsite and on-site power systems. Efforts to restore power to emergency equipment have been hampered or impeded by damage to the surrounding areas due to the tsunami and earthquake.

ML10760432

**NRC INSPECTION MANUAL** IR/B

TEMPORARY INSTRUCTION 2515/183

FOLLOWUP TO THE FUKUSHIMA DAIICHI NUCLEAR STATION FUEL DAMAGE EVENT

CORNERSTONE: INITIATING EVENTS AND MITIGATING SYSTEMS

**APPLICABILITY:** This Temporary Instruction (TI) applies to all holders of operating licenses for nuclear power reactors, except plants which have permanently ceased operations.

**2515/183-01 OBJECTIVES**

The objective of this TI is to independently assess the adequacy of actions taken by licensees in response to the Fukushima Daiichi nuclear station fuel damage event. The inspection results from this TI will be used to evaluate the industry's readiness for a similar event and to aid in determining whether additional regulatory actions by the U.S. Nuclear Regulatory Commission are warranted. Therefore, the intent of this TI is to be a high-level look at the industry's preparedness for events that may exceed the design basis for a plant. If necessary, a more specific followup inspection will be performed at a later date.

**2515/183-02 BACKGROUND**

On March 11, 2011, the Tohoku-Taiheiyou-oki Earthquake occurred near the east coast of Honshu, Japan. This magnitude 9.0 earthquake and the subsequent tsunami caused significant damage to at least four of the six units of the Fukushima Daiichi nuclear power station as the result of a sustained loss of both the offsite and on-site power systems. Efforts to restore power to emergency equipment have been hampered or impeded by damage to the surrounding areas due to the tsunami and earthquake. The following background information is current as of March 18, 2011.

Units 1 through 3, which had been operating at the time of the earthquake, scrambled automatically, inserting their neutron absorbing control rods to ensure immediate shutdown of the fission process. Following the loss of electric power to normal and emergency core cooling systems and the subsequent failure of back-up decay heat removal systems, water injection into the cores of all three reactors was compromised, and reactor water levels could not be maintained. Tokyo Electric Power Company (TEPCO), the operator of the plant, resorted to injecting sea water and boric acid into the reactor vessels of these three units, in an effort to cool the fuel and ensure the reactors remained shutdown. However, the fuel in the reactor cores became partially uncovered. Hydrogen gas built up in Units 1 and 3 as a result of exposed, overheated fuel reacting with water. Following gas venting from the primary containment to relieve

Issue Date: 03/23/11 1 2515/183

**NRC INSPECTION MANUAL** IR/B

TEMPORARY INSTRUCTION 2515/184

AVAILABILITY AND READINESS INSPECTION OF SEVERE ACCIDENT MANAGEMENT GUIDELINES (SAMGs)

CORNERSTONE: MITIGATING SYSTEMS

**APPLICABILITY:** This Temporary Instruction (TI) applies to all holders of operating licenses for nuclear power reactors, except plants which have permanently ceased operations.

**2515/184-01 OBJECTIVES**

The objectives of this TI are to:

- Determine that the severe accident management guidelines (SAMGs) are available and how they are being maintained.
- Determine the nature and extent of licensee implementation of SAMG training and exercises.

**2515/184-02 BACKGROUND**

On March 30, 2011, the Executive Director for Operations chartered a task force to conduct a near-term evaluation of the need for agency actions following the events in Japan. During the task force's deliberations, the importance of severe accident management guidelines (SAMGs) has been highlighted. The SAMGs were implemented as a voluntary industry initiative in the 1990s and are not part of the agency's routine Reactor Oversight Program. In order to evaluate the current status of SAMGs onsite and determine the need for any further recommendations, the task force is requesting the enclosed information regarding SAMGs at operating power reactors be gathered, assessed, and summarized.

**2515/184-03 INSPECTION REQUIREMENTS AND GUIDANCE**

03.01 Assess the availability and readiness of the licensee's ability to access and implement the SAMGs at their facility. Answer the following questions by filling out the attached datasheet.

- When were the SAMGs last updated? Are controlled copies of the SAMG located in the technical support center (TSC) (Y/N), emergency operations facility (EOF) (Y/N), control room (Y/N)? For licensees that use one common EOF for multiple reactor sites, one review of the EOF will serve for all applicable sites.

Issue Date: 04/29/11 1 2515/184

OMB Control No.: 3150-0012

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR REACTOR REGULATION  
WASHINGTON, DC 20555-0001

May 11, 2011

NRC BULLETIN 2011-01: MITIGATING STRATEGIES

**ADDRESSEES**

All holders of operating licenses for nuclear power reactors, except those who have permanently ceased operation and have certified that fuel has been removed from the reactor vessel.

**PURPOSE**

The U.S. Nuclear Regulatory Commission (NRC) is issuing this bulletin to achieve the following objectives:

- To require that addressees provide a comprehensive verification of their compliance with the regulatory requirements of Title 10 of the Code of Federal Regulations (10 CFR) Section 50.54(h)(2).
- To notify addressees about the NRC staff's need for information associated with licensee mitigating strategies under 10 CFR 50.54(h)(2) in light of the recent events at Japan's Fukushima Daiichi facility in order to determine if 1) additional assessment of program implementation is needed, 2) the current inspection program should be enhanced, or 3) further regulatory action is warranted, and
- To require that addressees provide a written response to the NRC in accordance with 10 CFR 50.54(f).

**BACKGROUND**

Following the terrorist events of September 11, 2001, the readiness of NRC-regulated facilities to manage challenges to core cooling, containment and spent fuel pool cooling (SFP) following large explosions or fires was enhanced through a series of orders and imposition of license conditions. These requirements were formalized in a series of orders of March 27, 2009, resulting in 10 CFR 50.54(h)(2).

The NRC conducted a comprehensive inspection of the implementation of the mitigating strategies developed by licensees in 2008. Subsequently the NRC incorporated this inspectable area into the baseline reactor oversight process on a sample basis as part of the triennial fire protection inspection.

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IN 2011-05

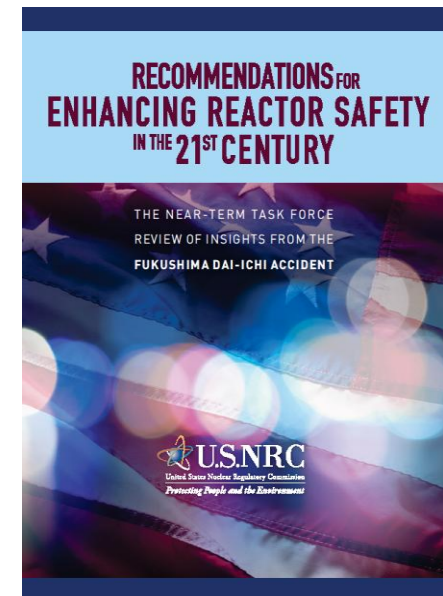
TI 2515/183

TI 2515/184

BL 2011-01

# NRC Lessons Learned Review

- Commission directed a methodical and systematic review of the safety of U.S. facilities in light of events in Japan
- Near-Term Task Force review completed July 2011  
([www.nrc.gov](http://www.nrc.gov))



## **U.S. Plant Safety**

- Similar sequence of events in the U.S. is unlikely
- Existing mitigation measures could reduce the likelihood of core damage and radiological releases
- No imminent risk from continued operation and licensing activities

# Identifying Lessons Learned

- July 2011
  - Near-Term Task Force (NTTF) report issued
- September/October 2011
  - NTTF recommendations prioritized into Tiers 1, 2, and 3
- February 2012
  - Draft orders and requests for information provided to the Commission
- March 2012
  - The NRC staff issued the Tier 1 orders and request for information on March 12, 2012

# Orders

- The NRC staff ordered licensees to:
  - Develop strategies and procure additional equipment to address beyond-design-basis external events and multiunit events
  - Include a reliable hardened vent in Mark I and Mark II containments
  - Enhance spent fuel pool level instrumentation for beyond design basis accidents

# Requests for Information

- The NRC requested that licensees provide information on:
  - the adequacy of facility design bases with respect to seismic and flooding hazards
  - whether facility configurations, as confirmed by seismic and flooding walkdowns, are in compliance with current facility design bases
  - current communications system power supplies and their availability during a prolonged SBO event
  - the required staffing necessary to respond to a multiunit, prolonged SBO event



# Rulemaking Activities

- Station Blackout (SBO) Rulemaking
  - Modify the SBO rule to require enhanced capability to mitigate a prolonged SBO
  - Advanced Notice of Proposed Rulemaking issued
  - The Commission directed that SBO rulemaking be completed within 24-30 months
- Emergency Procedures Integration Rulemaking
  - Create a new rule requiring the integration of the emergency procedures
  - Advanced Notice of Proposed Rulemaking issued
  - The rulemaking is expected to be completed in 2016

## Other Recommendations for NRC Action

- Tier 2 Recommendations – Could not be initiated in the near term due to factors that include the need for further technical assessment and alignment, dependence on Tier 1 issues, or availability of critical skill set limitations.
- Tier 3 Recommendations – Require further staff study to support a regulatory action, have an associated shorter-term action that needs to be completed to inform the longer-term action, are dependent on critical skill sets, or are dependent on the resolution of NTTF Recommendation 1.

## **Tier 3 Recommendations**

- Commission-approve Charter
- Longer-Term Task Groups
  - Team Leader (SES or Branch Chief)
  - Subject Matter Experts
  - Japan Lessons-Learned Directorate
- Lead is with the Line Organizations
- Recommendation for action to the Steering Committee through the lead office

## **Focus of Longer-Term Review**

- Identification and resolution of key issues and information needed to support a recommendation on the need for regulatory action
- Program plans to guide issue identification and resolution
- Planning framework will extend to decision point on whether regulatory action is needed, but not beyond

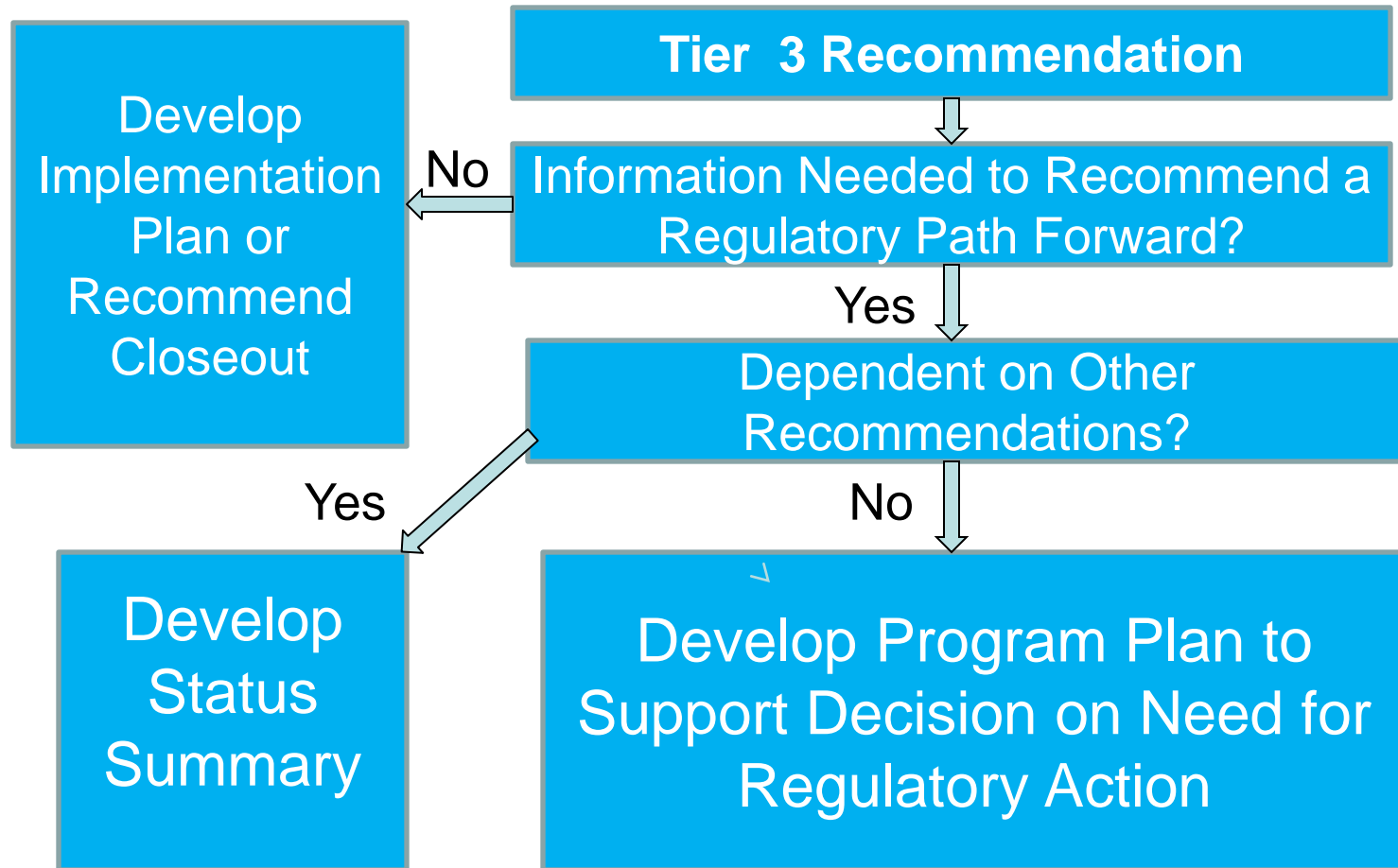
## **Tier 3 Recommendations**

- 2.2 Periodic Confirmation of Seismic and Flooding Hazards
- 3 Potential Enhancement to the Capability to Prevent or Mitigate Seismically-Induced Fires and Floods
- 5.2 Reliable Hardened Vents for Other Containment Designs
- 6 Hydrogen Control and Mitigation Inside Containment or in Other Buildings
- 9.1/9.2 EP Enhancements for Prolonged SBO and Multiunit Events
- 9.3 ERDS Capability
- 10 Additional EP Topics for Prolonged SBO and Multiunit Events

## **Tier 3 Recommendations (cont.)**

- 11 EP Topics for Decision-making, Radiation Monitoring, and Public Education
- 12.1 Reactor Oversight Process Modifications
- 12.2 Staffing Training on Severe Accidents and Resident Inspector Training on SAMGs
- Transfer of Spent Fuel to Dry Cask Storage
- Prestaging of Potassium Iodide Beyond 10 Miles
- Reactor and Containment Instrumentation Ability to Withstand Beyond Design Basis Conditions
- Basis of Emergency Planning Zone Size

# Flow Chart for Tier 3 Recommendations



# Questions?





**U.S.NRC**

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# **Recommendation 2.2**

## **Periodic Reassessment of External Hazards**

Jenise Thompson

May 23, 2012

## Background

- NTTF report asks staff to “initiate rulemaking to require licensees to confirm seismic hazards and flooding hazards every 10 years and address any new and significant information. If necessary, update the design basis for SSCs important to safety to protect against the updated hazards.”
- Recommendation 2.1 and 2.3 are currently underway for seismic and flooding hazards
- Recommendation 2.1 for other natural external hazards has not started work yet due to resource limitations.

# Staff Approach

- **Define and begin the initial pre-rulemaking activities necessary to position the agency for a future rulemaking to implement NTTF Recommendation 2.2, as resources become available**
- **Scope of rulemaking to include external hazards**
  - **Seismic**
  - **Flooding**
  - **Other natural external hazards**
  - **Other man-related external hazards (under discussion)**

# Pre-rulemaking Activities

- Collect information as it comes up for R2.1 and R2.3
- Engage with external stakeholders as appropriate
- What constitutes new and significant information?
- What will the staff do with the updated hazard information?
  - Use of risk-informed approach?
- How will staff determine if it is necessary to update the design basis for SSCs important to safety?
  - Threshold for regulatory actions
- Review of international practices and insights from Recommendation 2.1

# Public Meeting – May 7, 2012

- Questions from public
  - Nexus to Fukushima for inclusion of other man-related external hazards
  - “old” information “newly” discovered
  - Handling of information submitted as contention to new reactor licensing
  - Similar actions in the past (GI program)
  - Schedule concerns

# Questions?



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# **NTTF Recommendation 3: Seismically Induced Fires and Floods**

May 22, 2012

Kevin Coyne, RES/DRA

# Background

- Seismic events have the potential to cause:
  - multiple failures of safety-related SSCs;
  - induce separate fires or flooding events in multiple locations at the site; and
  - degrade the capability of plant SSCs intended to mitigate the effects of fires and floods.



# Background

- The NTTF recommended, as part of the longer term review, evaluation of potential enhancements to the capability to prevent or mitigate seismically induced fires and floods
  - Scope includes internal seismically induced fires (e.g., breakers, transformers) and floods (e.g., tanks, piping systems)
  - External seismically induced fires and floods are considered to be outside the scope of this issue
- Prioritized as Tier 3 in SECY 11-0137
  - Commission agreed with Tier 3 Prioritization, but
  - Directed the staff to initiate development of PRA method to evaluate potential enhancements as part of Tier 1 activities

## Background (con't)

- PRA Method Challenges:
  - hazard definition & characterization
  - seismic fragilities for SSCs, including fire protection components
  - modeling concurrent and subsequent initiating events
  - treatment of systems interactions
  - human reliability analysis methodologies suitable for seismically induced hazards
  - multiunit risk considerations

# Current Status

- Staff developed an initial plan for PRA method development in SECY 12-0025.
- PRA pre-planning activities include:
  1. Define objectives of method
  2. Identify relevant stakeholders
  3. Information gathering
  4. Coordination with other ongoing initiatives
  5. Resource and schedule estimate

## Current Status (con't)

- Key Considerations
  - Limited number of staff with required knowledge, skills, and abilities
  - No current consensus state-of-practice methods exist for seismically induced fires and floods for NPPs
  - ASME/ANS Joint Committee on Nuclear Risk Management recently formed a working group to address multiple concurrent events
  - Other Tier 1 activities will provide substantial information relevant to this issue

# Staff Assessment

- Results from several Tier 1 recommendations will better inform the this issue:
  - 2.1 Seismic and flooding hazard evaluation
  - 2.3 Seismic and flooding vulnerability walkdowns
  - 4.2 Mitigation Strategies
  - 5.1 Containment venting
  - 7.1 Spent fuel pool
- More efficient to wait until sufficient information becomes available from these efforts.

## **Staff Assessment (con't)**

- Some work can be done now:
  - Standards development organization engagement
  - Assess results from NTTF  
Recommendations 2.1, 4.2, 5.1, 7.1  
and other activities
  - Continue PRA method development activities

# Staff Recommendation

- Continue development of PRA methodology
  - Engagement with PRA standards development organizations
  - Feasibility study to assess approaches for evaluating multiple concurrent events
- Assess results from Tier 1 activities and other related work
- Future re-evaluation of Recommendation 3

## **Public Comments (May 3)**

- Agreement on prioritization of issue as Tier 3
- Qualitative risk assessment approaches should also be considered
- Ensure that the PRA method (and its application) includes documentation of key assumptions.



# Questions?



## **Hydrogen Control and Mitigation (NTTF Recommendation 6)**

Brett Titus  
Office of Nuclear Reactor Regulation

# Background

- The NTTF recommended, as part of the longer term review, identification of insights about hydrogen control and mitigation
  - Scope includes generation, transport, distribution, and combustion of hydrogen
  - Primary areas of interest consist of containment and adjacent buildings (although other locations are not excluded)
- Prioritized as Tier 3 in SECY 11-0137
- Commission agreed with Tier 3 Prioritization

## Staff Assessment- Recommendation 6

- Interdependencies with other NTTF Tier 3 recommendations.
  - Implementation of Rec. 4 (SBO)
  - Rec. 5 (Hardened Vents) greatly reduce the likelihood of hydrogen explosions
  - Filtered Vents- concurrent analysis
    - Outcome could impact the path forward for Rec 6
    - These efforts will be collaborative

## **Staff Assessment- Recommendation 6**

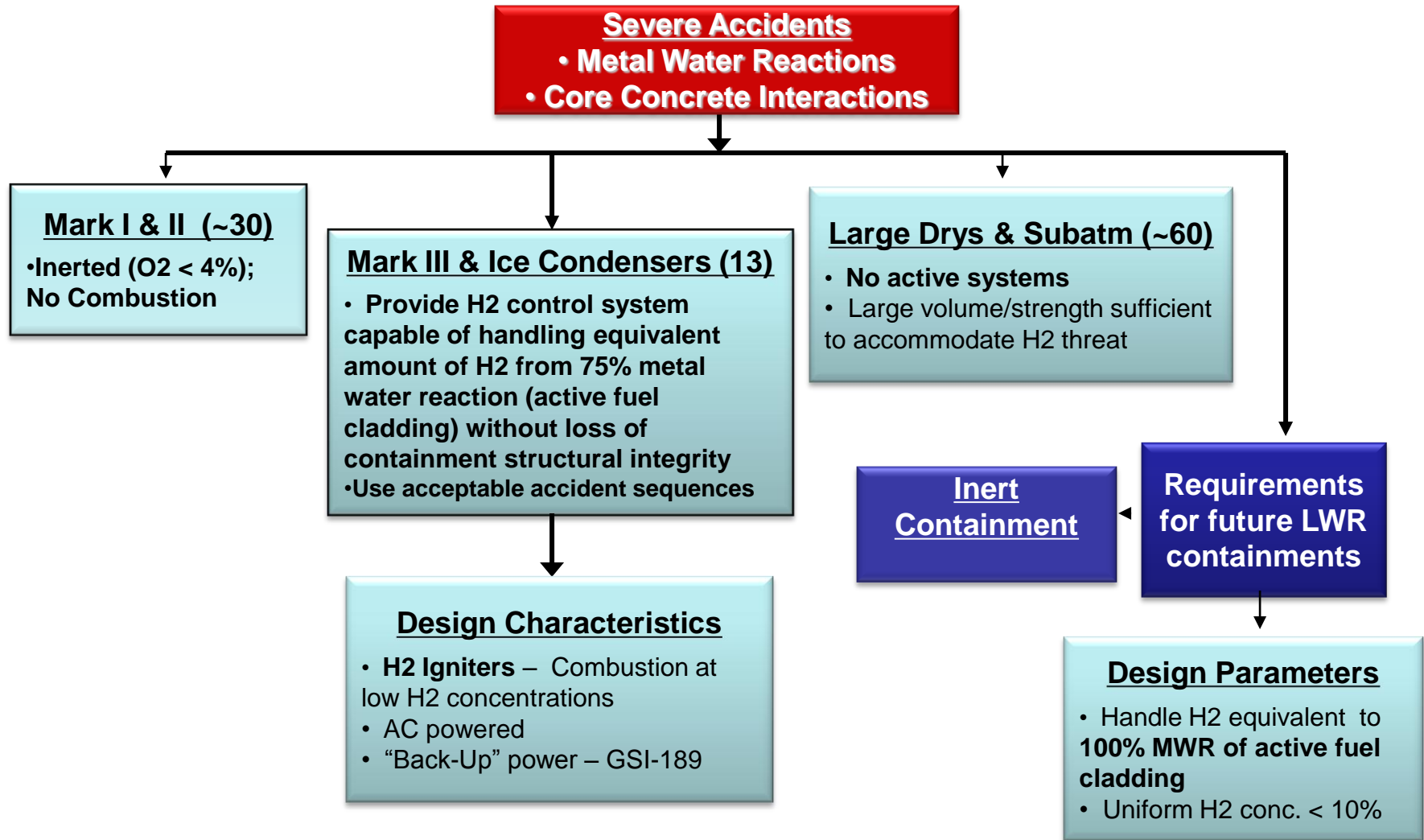
- Potential risk of hydrogen production and combustion is well known
  - Three Mile Island (1979)
  - Numerous Generic Issues and Generic Safety Issues
  - Many studies performed worldwide

## **Staff Assessment- Recommendation 6**

- 10 CFR 50.44, “Combustible Gas Control for Nuclear Power Reactors” revised in 2003
  - Eliminated requirements for H<sub>2</sub> recombiners and relaxed monitoring rules commensurate with risk significance
  - Retained requirements for mixed atmosphere, inert MK I&II containments, maintained 75% clad-water H<sub>2</sub> reaction criteria (100% for New Reactors) in MK III and Ice Condensers

## 10 CFR 50.44

# Combustible Gas Control for LWRs



## Staff Assessment - Recommendation 6

- Key Questions to be Investigated
  1. Is there new information regarding H<sub>2</sub> in general?
  2. Was the failure of the buildings consistent with our understanding?
  3. Are there important gaps in our understanding of the threat from H<sub>2</sub> gas?
  4. Is there new information which conflicts with the current technical basis?
  5. Has new technical information been revealed to necessitate regulatory action?



# Plan for Addressing Recommendation 6

1. Examine additional H<sub>2</sub> control measures in adjacent buildings
  - Conduct stakeholder meetings for all existing containment types
  - Evaluate additional mitigation measures to improve robustness of reactor and auxiliary buildings
  - Quantify the impact on safety and risk

# Plan for Addressing Recommendation 6

## 2. Evaluate the sources and timing of H<sub>2</sub> generation

- Review accident sequence info from Gov't of Japan, TEPCO, INPO, and international orgs
- Compare the actual accident timing and amounts of generated H<sub>2</sub> to analytical predictions
- Assess implications of results on the existing state of knowledge

# Plan for Addressing Recommendation 6

## 3. Assess the potential migration/release pathways

- Review available forensic info from Gov't of Japan, TEPCO, INPO, and international org
- Use information (supplemented by reasonable assumptions) to conduct best estimate modeling to evaluate containment release pathways
- Assess implications of results on the existing state of knowledge

# Plan for Addressing Recommendation 6

## 4. Review the Technical Basis for 10 CFR 50.44

- Considering the results of Tasks 1-3, confirm the validity of the existing basis or identify gaps and characterize their safety/risk significance
- Conduct stakeholder meetings for all existing containment types
- Determine if any regulatory action is needed

# Challenges

- Very little reliable empirical data on H<sub>2</sub> has been reported since the accident
- Verifiable information on chain of events may not be available for 10+ years
- H<sub>2</sub> generation and control following a severe accident is a highly specialized technical discipline

# Public comments

- Public meeting on May 14, 2012

# Questions?



# **EP NTTF Recommendations Tier 2 & 3 Implementation**

Kevin Williams  
Office of Nuclear Security and Incident Response



# NTTF EP Recommendations

## Tier 2 Action

- NTTF Recommendation 9.3 - Emergency preparedness regulatory actions (the remaining portions of Recommendation 9.3, with the exception of Emergency Response Data System (ERDS) capability addressed in Tier 3)

## Tier 3 Actions

- NTTF Recommendations 9.1/9.2 - Emergency preparedness (EP) enhancements for prolonged SBO and multiunit events (dependent on availability of critical skill sets)
- NTTF Recommendation 9.3 – ERDS capability (related to long-term evaluation Recommendation 10)
- NTTF Recommendation 10 - Additional EP topics for prolonged SBO and multiunit events (long-term evaluation)
- NTTF Recommendation 11 - EP topics for decision-making, radiation monitoring, and public education (long-term evaluation)

# NRC Staff Commitments

- SECY-11-137 stated that the staff will initiate the Tier 2 actions associated with EP regulatory actions when sufficient technical information and applicable resources become available.
- SECY-11-0137 stated that the staff will provide assessments of the Tier 3 recommendations once it had completed its evaluation of the resource impacts associated with the Tier 1 and 2 recommendations.
- The staff will address the Tier 3 EP-related recommendations, schedules, and resources in the upcoming July SECY paper to the Commission.
- The staff will take regulatory action, as appropriate, after evaluating the licensee responses to the 50.54(f) letters (staffing and communication).
- The staff will continue to engage with stakeholders on the Tier 2 and Tier 3 EP-related recommendations.

# Advanced Notice of Proposed Rulemaking

- The staff considers existing EP framework and regulations provide reasonable assurance of adequate protection of public health and safety in the event of a radiological emergency.
- The staff is considering an Advance Notice of Public Rulemaking (ANPR) to be utilized to determine if a technical-basis for rulemaking can be developed for EP-related NTTF Recommendations (9.1, 9.2, 9.3, 9.4, 10, and 11).
- Some of the recommendations may screen out to long-term studies.
- The staff would initiate the ANPR when sufficient resources become available which would include stakeholder engagement.
- The staff will address the ANPR and a completed evaluation of the resource impacts and scheduled in the upcoming July SECY paper to the Commission.

# Emergency Planning Zones

- The staff considers that the existing Emergency Planning Zone (EPZ) size provides reasonable assurance of adequate protection of public health and safety in the event of a radiological emergency.
- EPZ size re-evaluation is a longer-term action that is already being assessed by existing activities.
- The staff will utilize insights from the current Level 3 Probabilistic Risk Assessment (PRA) study results to inform the process for evaluation of potential impact that a multi-unit event may have on the EPZ.
- Any changes to EPZs would be discussed with stakeholders in public meetings.

## Potassium Iodide (KI)

- The staff considers that the existing KI framework and regulations provide reasonable assurance of adequate protection of public health and safety in the event of a radiological emergency.
- The staff has concluded that based on available data to date, it is unlikely that the FDA thyroid dose PAGs were exceeded beyond 10 miles as a result of the accident at Fukushima.
- The staff will continue to monitor and evaluate the results of the findings by the Japanese government from studies conducted in and around the Fukushima.

# Public comments

- Public meeting on May 4, 2012

# Questions?



# **Recommendation 12.1 Status**

May 23, 2012

Tim Kobetz,

Chief, Reactor Inspection Branch  
Office of Nuclear Reactor Regulation



## **Recommendation 12.1**

**Strengthen the Reactor Oversight Process (ROP) to more fully include defense-in-depth considerations**

- Expand the scope of the annual ROP self assessment
- Expand the scope of the biennial ROP realignment

# **Dependent on Recommendation 1**

This recommendation is dependent on Recommendation 1 which recommended establishing a logical, systematic, and coherent regulatory framework that balances defense-in-depth and risk considerations.

# Plan

- The staff will continue to implement the ROP in accordance with current policy
- Staff will begin to consider potential changes to the ROP self assessment and realignment programs when an action plan for Recommendation 1 has been established.
- The staff does not envision any unique challenges.

# Communications

- Periodic stakeholder interactions will take place as necessary during the NRC's routine monthly meetings with NEI and the industry on ROP topics.
- Update the Commission on the status of Recommendation 12.1 in 2013 annual ROP Self-assessment SECY paper (issued in spring 2014).

# Public Meeting on May 7<sup>th</sup>

- No questions or comments were received

# Questions?



# **Staff Training on Severe Accidents and Severe Accident Management Guidelines**

May 23, 2012

Joseph G. Giitter

Travis L. Tate

# Purpose and Background

- Purpose
  - discuss the plan for Near-Term Task Force (NTTF) Recommendation 12.2 by describing the current level of NRC staff training on severe accidents and outline future training enhancements
- Background
  - SECY-11-0093 , NTTF Report – July 12, 2011
  - Staff Requirements Memorandum (SRM) for SECY-11-0093 – August 19, 2011
  - SECY-11-0137 – October 3, 2011
  - SRM for SECY-11-0137 – December 15, 2011



# NTTF Recommendations

- Recommendation 12.2 (dependent on Recommendation 8)
  - “Enhance NRC staff training on severe accidents, including training resident inspectors on Severe Accident Management Guidelines (SAMGs)”
- Recommendation 8.4
  - “Initiate rulemaking to require more realistic, hands-on training and exercises on SAMGs and EDMGs for all staff expected to implement the strategies and those licensee staff expected to make decisions during emergencies, including emergency coordinators and emergency directors”

# Severe Accident Training

- Accident Progression Analysis
  - post-core damage conditions
- Accident Consequence Analysis
  - transport from core damage
- Perspectives on Reactor Safety
  - overview (design for safety, defense-in-depth, ECCS rulemaking, severe accident and safety goal policy)
  - accident sequences
  - accident progression (vessel/containment)
  - radiological releases and consequences

# Relevant NRC Training

- Emergency Operating Procedures (EOPs)
  - GE Emergency Procedure and Severe Accident Guidelines
  - Westinghouse Emergency Procedure Guidelines
  - B&W / CE Emergency Procedure Guidelines
- Westinghouse SAMGs (video)

# Qualification Training

- Senior Reactor Analyst
- Reactor Technical Reviewer
- Reactor Risk Analyst
- Nuclear Safety Professional Development Program

# Enhancements

- Near-term actions
  - Frequency of severe accident courses
  - Update courses based on Fukushima lessons-learned
  - Qualification Program severe accident courses
  - Stakeholder feedback
    - Public Meeting – May 7, 2012

## **Enhancements (cont.)**

- Longer-term actions
  - Dependent on Recommendation 8
  - State-of-the-Art Reactor Consequence Analysis (SOARCA)
  - Level 3 Probabilistic Risk Analysis
  - Fukushima lessons-learned
  - Qualification Program SAMG courses
  - Potential new course development
  - Stakeholder feedback

# Public comments

- Public meeting on May 7, 2012

# Questions?





# **Reactor and Containment Instrumentation (ACRS Recommendation 2(e))**

Bill Kemper  
Office of Nuclear Reactor Regulation

# Background

ACRS 2(e) – “Selected reactor and containment instrumentation should be enhanced to withstand beyond-design-basis accident conditions”

- Current Reactors –Implement Post-TMI instrument recommendations to address design basis accidents
- New Reactors—Implement Post-TMI instruments plus describe severe accident capabilities

# Dependencies

- Seismic and Flooding Evaluations
- SBO Rulemaking
- Mitigating Strategies Order
- Spent Fuel Pool Instrumentation Order
- EOPs/SAMGs/EDMGs Integration Rulemaking

## **Staff Recommendations**

- Ensure that the need for enhanced reactor, containment , and SFP instrumentation is being adequately considered during Tier 1 NTTF actions
- Review/participate in domestic & international efforts to study/develop severe accident info needs and identify instrumentation gaps
- Gather and review information results from higher Tier actions
- Determine needs for a regulatory framework for enhanced reactor and containment instrumentation

# Stakeholder Feedback

- Public Meeting held on May 7
- NEI Feedback
- Public question

# Public comments

- Public meeting on May 7, 2012

# Questions?



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# **Additional Recommendation 5 Expedited Transfer of Spent Fuel to Dry Casks**

Steve Jones

Office of Nuclear Reactor Regulation



## Background

- In SECY 11-0137, the staff included an additional recommendation for expedited transfer of spent fuel to dry cask storage.
- Stakeholders have repeatedly requested such action as part of petitions for regulatory action based on the perceived potential to reduce the probability and consequences of overheated stored fuel.
- This issue has a nexus to the Fukushima Daiichi event because the potential for overheating of stored fuel, although unrealized, was a significant concern.

## **Staff Approach**

- Complete validation of spent fuel safety with respect to the Commission Safety Goals, considering past evaluations and results of spent fuel pool scoping study.
- Analyze information using NRC Regulatory Analysis Guidelines to inform a recommendation.
- Identify any inconsistencies or gaps that may need additional research.
- Gather stakeholder input on staff analysis of information.
- Recommend course of action to the Commission.

# Spent Fuel Pool Scoping Study

- Limited-scope consequence assessment
  - Specific to a single site configuration
  - Seismic initiator based on results of past studies
- Considers:
  - Configuration through 5 stages of operating cycle
  - High and low density fuel storage (racks unchanged)
  - Event progression with and without mitigation
- Supports:
  - Validation of seismic modeling
  - Validation of event progression modeling
  - Validation of consequence modeling

## Identified Gaps

- Issues that increase value of transfer
  - Criticality (e.g., degraded neutron absorbers)
  - Multi-unit issues
- Issues that decrease value of transfer
  - Cask drop hazard (i.e., increased cask movement with hot fuel in pool)
  - Operational risks (e.g., radiation dose)
  - Industry limitations (e.g., cask production)
  - Repackaging for transportation and disposal

## Related Issues

- Order EA 12-049: Mitigation Strategies
  - Enhances 10 CFR 50.54(hh) mitigation capabilities
  - SFP spray capabilities subject to further discussion
- Order EA 12-051: Spent Fuel Pool Instrumentation
- NTTF Recommendations 7.2-5 (Tier 2)
  - Safety-related makeup availability
  - Seismically-qualified spray capability

## **Stakeholder Feedback**

- Category 3 Public Meeting held on May 14
- NEI Used Fuel Management Conference on May 8
- No specific feedback on program plan
- Stakeholder comments included:
  - Requests for immediate NRC action to require transfer of spent fuel to dry casks
  - Proposed areas of consideration/research to address the issue, which is already in the plan
  - Concern that the NRC is over-regulating spent fuel storage

# Questions?



**Dr. Annie Kammerer**  
**R2.3 Seismic Walkdown Team**

**ACRS Meeting**

May 2012

# **Overview and Development of R2.3 Seismic Walkdown Guidance**



# Schedule Overview

- Outline provided 3/27/12
- Final document to be provided 5/23/12
- 8 public meetings from start to finish

**Recommendation 2.3 Seismic Walkdown Industry Guidance Development and Endorsement**

Date	Task (notes)	NRC Action	Industry Action	Completed Date
3/12/2012	50.54(f) Letter Released	X	-	3/12/2012
3/27/2012	First Draft to NRC	-	X	3/27/2012
4/2-3/12	Public Meeting	X	X	4/2-3/2012
4/6/2012	Internal Feedback Due	X	-	-
4/17/2012	Follow up public conferenc call	X	X	4/17/2012
	NRC final comments on the NEI outline	X		4/23/2012
4/24/2012	First (partial) draft of guidance to NRC	-	X	4/25/2012
4/27/2012	Public Meeting (working meeting)	X	X	4/27/2012
5/2/2012	Updated draft of section 5 and figures from section 1		X	5/2/2012
5/2/2012	Updated draft of section 1 and figures provided		X	5/3/2012
5/3-4/2012	Public webinar on sections 1 and 5	X	X	5/3-4/2012
5/8/2012	Updated draft of sections 1, 2, 4 and 5 to NRC		X	5/8-15/12
5/9/2012	Updated draft of section 3 to NRC		X	5/17/2012
5/10/2012	Public webinar on sections 4 (and 3)	X	X	5/10/2012
5/11/2012	First draft of Appendix C checklists to the NRC		X	5/11/2012
5/14/2012	Pubilc webinar on section 3 and C	X	X	5/14/2012
5/15/2012	First draft of Section 6 to the NRC		X	5/18/2012
5/17/2012	Public webinar on sections 6 and the whole	X	X	5/17/2012
5/21/2012	Public webinar on section 6	X	X	5/21/2012
5/25/2012	Public webinar to close out	X	X	
5/11/2012	Final draft to NRC (moved to 5/18/12)		X	NOT YET RECEIVED current date 5/23/12
5/30/2012	NRC Endorsement	X		
End November	Seismic Walkdowns complete		X	

# Guidance Content

## (Main Body)

- 1: Overview of approach
- 2: Personnel qualifications
- 3: Development of SSEL and SWEL
- 4: Seismic walkdowns and area walk-bys
- 5: Seismic licensing basis evaluations
- 6: Peer review
- 7: IPEEE vulnerabilities
- 8: Submittal report

# Guidance Content

## (Appendices)

- A: Acronyms
- B: Equipment classes
- C: Checklists
- D: Seismic spatial interactions
- E: Systems to support safety function
- F: Checklist for peer review of safety system selection
- G: Definition of terms
- H: Documentation requirements in the 50.54(f) letter

# Personnel

- Equipment selection personnel
- Plant operations personnel
- Seismic walkdown engineers
  - A degree in mechanical or civil/structural engineering
  - Experience in seismic engineering, as it applies to nuclear power plants.
  - Completing either the EPRI NTTF 2.3 Seismic or SQUG Walkdown Training Course
- Licensing basis reviewer
- IPEEE reviewers
- Peer Review team

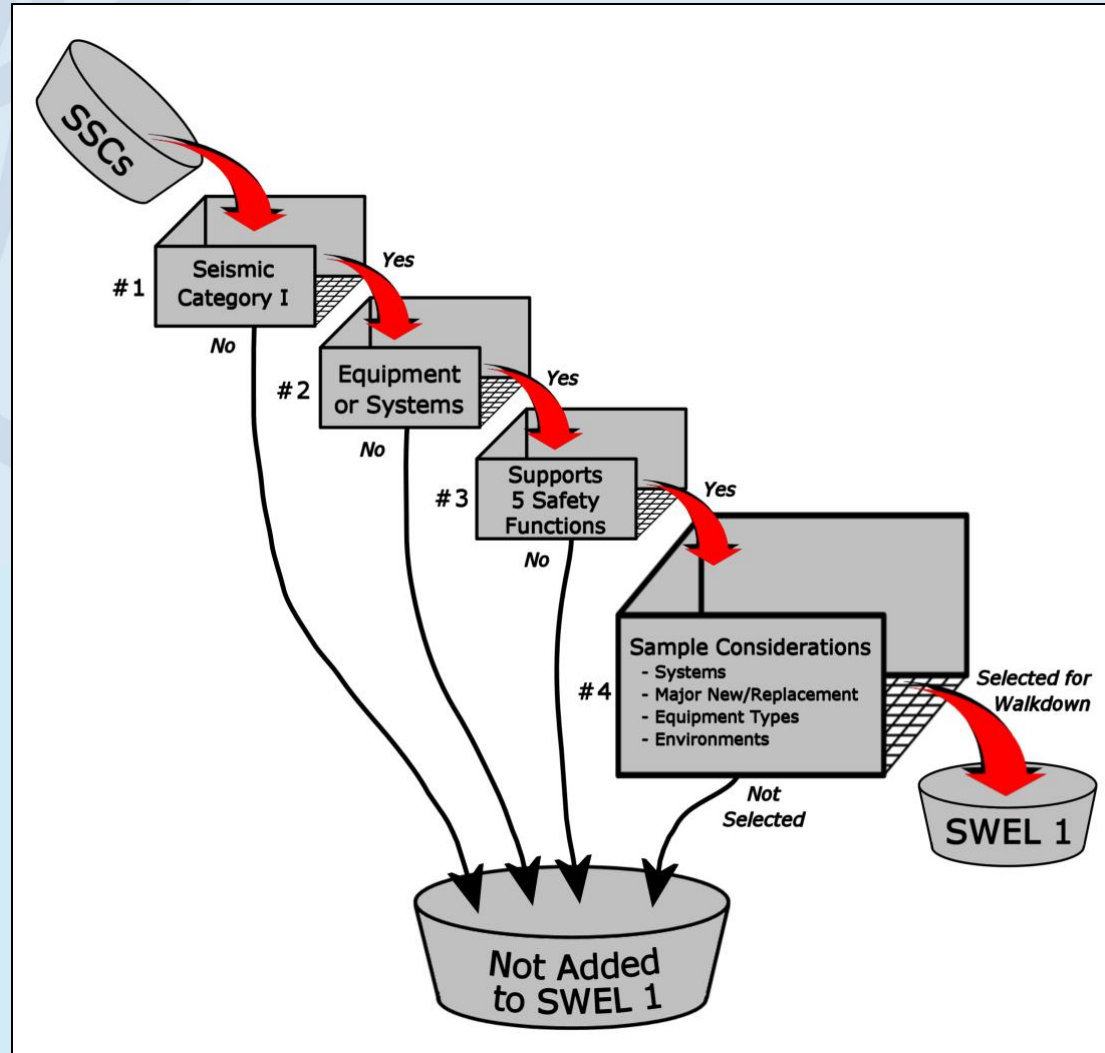
# Sampling Approach

- Safe shutdown equipment lists (SSELs) have 100s to 1000+ pieces of equipment
- Smart sampling approach used to broadly sample the NPP
- Sampling across systems and equipment categories, including containment functions and the spent fuel pools
- Seismic walkdown equipment list (SWEL) augmented by area walk-bys and CAP (as needed)

# Sampling Approach

- SWEL 1 samples across full SSEL of SC 1 equipment to include the range of:
  - 5 safety functions: Reactor reactivity control, reactor coolant pressure control, Reactor coolant inventory control, Decay heat removal, Containment function
  - Variety of frontline and support systems
  - 21 equipment classes
  - Major new/replacement equipment
  - Variety of environments
  - Changes due to IPEEE vulnerabilities

# SWEL 1

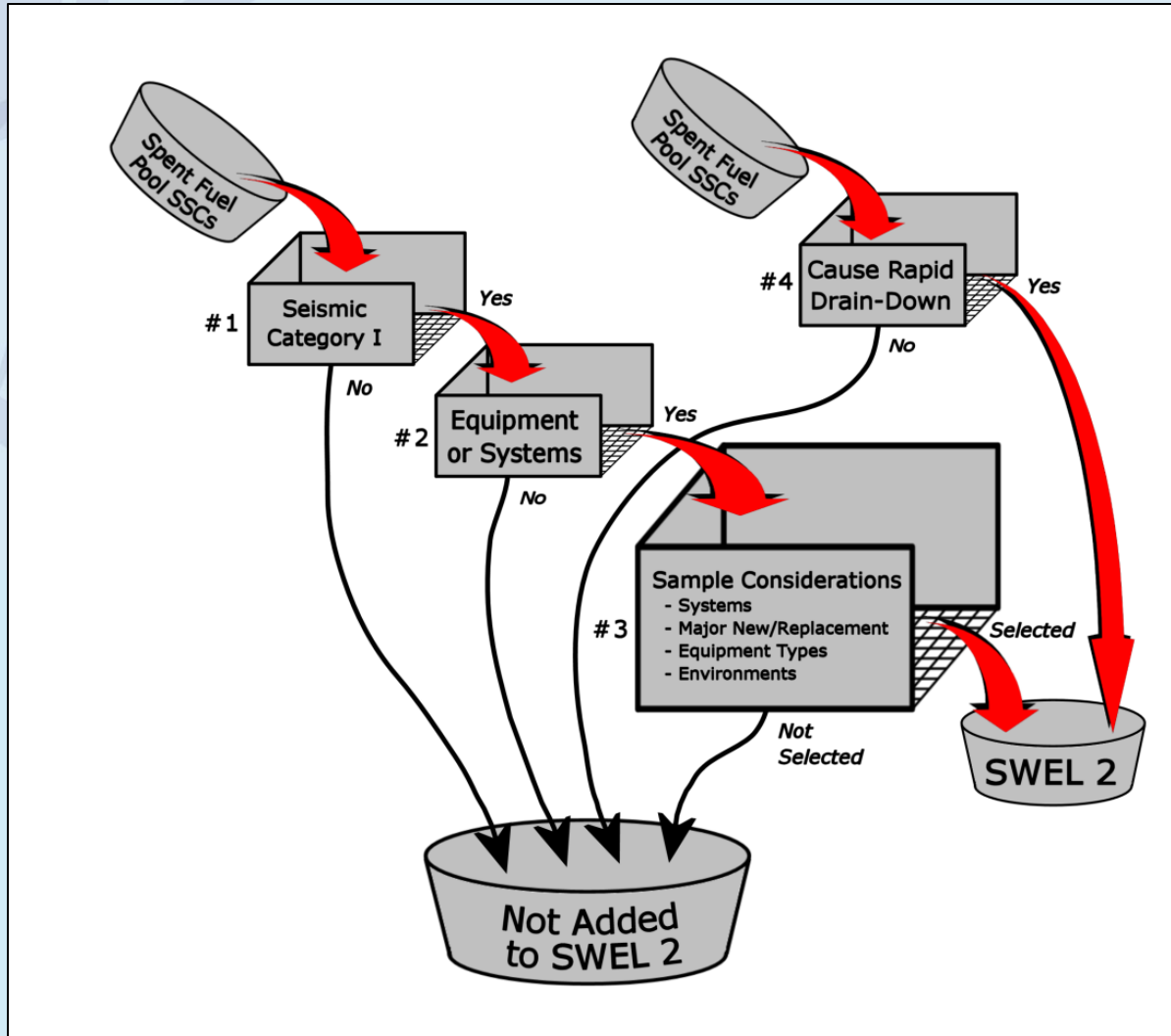


# Sampling Approach

- SWEL 2 is focused on spent fuel pools:
  - Sample of SC1 equipment across systems and classes
  - All items that can cause rapid drain down



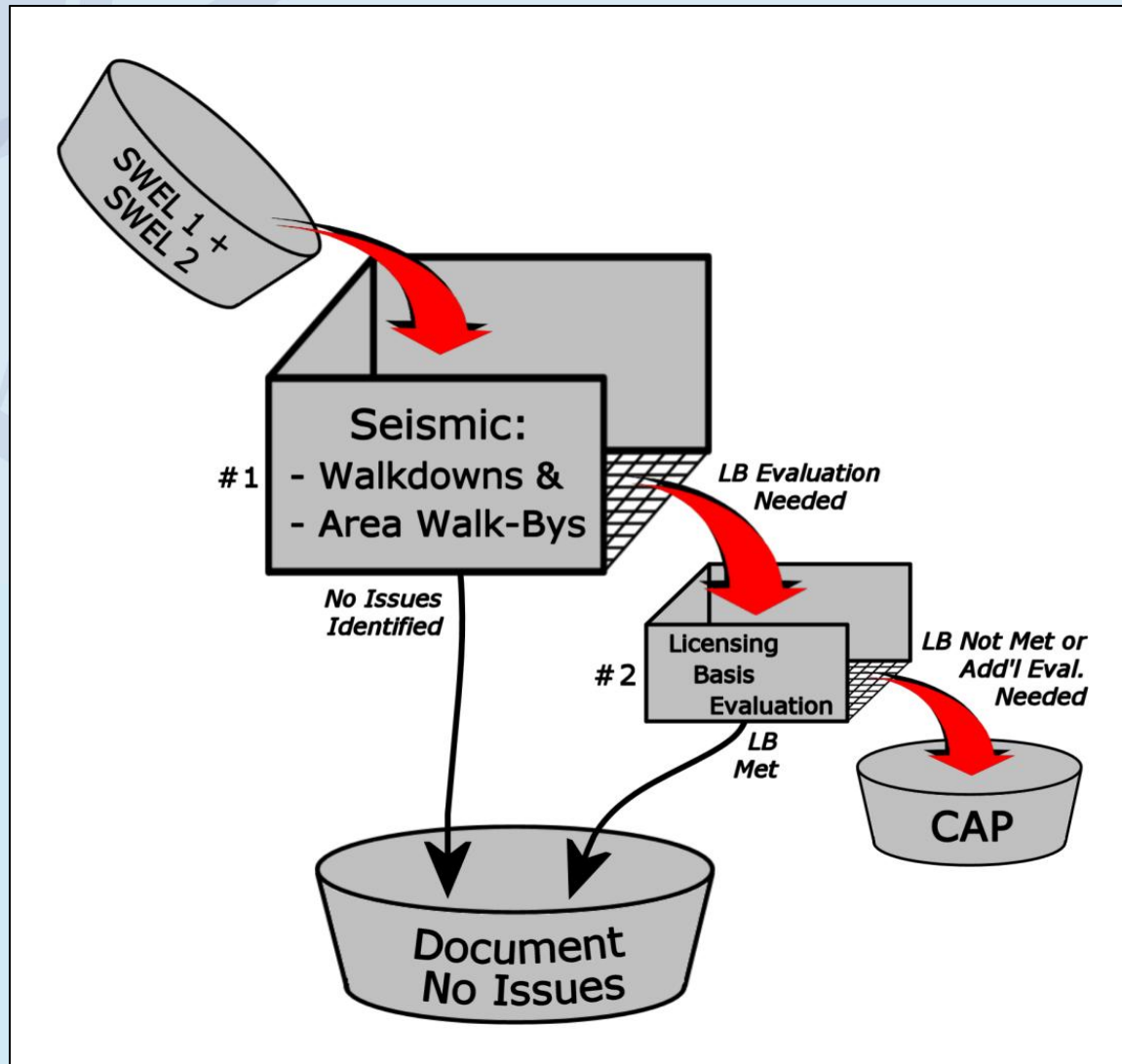
# SWEL 2



# Walkdowns and Walk-bys

- Equipment Walkdowns
  - Equipment-focused intensive
  - Cabinets opened and design of anchorages confirmed (for 50%)
- Area Walk-bys
  - Conducted in rooms with SWEL equipment
  - Visual inspection of nearby SSEL equipment
  - Looking for 2/1, seismically-induced fire and flood initiators, overloaded cable trays
  - Cabinets remained closed
  - Only anchorages that look odd confirmed
  - Effectively extends the sampling

# Relationship with the CAP



# IPEEE Vulnerabilities

- The 50.54(f) Letter requests information (item 2c) “A list of plant-specific vulnerabilities (including any seismic anomalies, outliers or other findings) identified by the IPEEE and a description of the actions taken to eliminate or reduce them (including their completion dates).”
- Section 7 provides guidance on the activities undertaken to address the request for information. Also discussed in peer review and documentation sections.

# Peer Review

- Minimum of two reviewers on a peer review team
- Peer review Team Lead responsible for overall review
- Peer review to be conducted start to finish with participation by at least two reviewers in each stage

# Peer Review Elements

- Review selection of the SSCs in the SWEL
- Review a sample of the checklists from the Seismic Walkdowns and Area Walk-Bys
- Review the licensing basis evaluations
- Review the decisions for entering the potential adverse conditions into the CAP
- Review the final report
- Summarize the results of the peer review process in the submittal report

# Informing R2.1

- The component walkdowns and area walkbys will both inform the R2.1 activities
  - Collection of information on IPEEE-related plant changes (or lack of changes) for input into the screening activities of R2.1.
  - Identification of 2/1, seismically-induced fire, and seismically-induced flood will feed into risk studies
  - Walkdowns provide information on the status of the plant and the degree that new issues have arisen related to plant changes



# Thank You

## **Overview and Development of R2.3 Seismic Walkdown Guidance**