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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

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631ST MEETING

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

(ACRS)

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THURSDAY

FEBRUARY 4, 2016

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ROCKVILLE, MARYLAND

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The Advisory Committee met at the  
Nuclear Regulatory Commission, Two White Flint  
North, Room T2B3, 11545 Rockville Pike, at 8:31  
a.m., Dennis Bley, Chairman, presiding.

COMMITTEE MEMBERS:

- DENNIS C. BLEY, Chairman
- MICHAEL L. CORRADINI, Vice Chairman
- RONALD G. BALLINGER, Member
- SANJOY BANERJEE, Member
- CHARLES H. BROWN, JR. Member
- DANA A. POWERS, Member
- HAROLD B. RAY , Member
- JOY L. REMPE, Member

1 PETER RICCARDELLA, Member-at-Large

2 GORDON R. SKILLMAN, Member

3 JOHN W. STETKAR, Member

4

5 DESIGNATED FEDERAL OFFICIAL:

6 CHRISTOPHER BROWN

7

8 ALSO PRESENT:

9 JIM ARMSTRONG, Exelon

10 CHAKRAPANI BASAVARAJU, NRR

11 JOSH BORROMEO, NRR

12 DOUGLAS BROADDUS, NRR

13 PATRICK CASTLEMAN, COM

14 GORDON A. CLEFTON, NEI

15 PAUL CLIFFORD, NRR

16 MICHAEL COOK, GE-Hitachi

17 DANIEL DOYLE, NRR

18 IRA JERRY DOZIER, NRR

19 RICHARD DUDLEY, NRR

20 EUGENE A. EAGLE, JR., NRR

21 RICK ENNIS, NRR

22 C.J. FONG, NRR

23 STEPHEN GEIER, NEI

24 EDWIN M. HACKETT, Executive Director, ACRS

25 BRUCE HAGEMEIER, GE-Hitachi

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1 ANTHONY HIGHTOWER, Exelon  
2 TARA INVERSO, NRR  
3 KENNETH J. KARWOSKI, NRR  
4 LARRY KING, GE-Hitachi  
5 JESSICA KRATCHMAN, NRR  
6 ROBERT KRSEK, COM  
7 SHAWN LAMB, GE-Hitachi  
8 STEVEN LAUR, NRR\*  
9 MARVIN LEWIS, Public Participant\*  
10 TIM LUPOLD, NRR  
11 JOSE MARCH-LEUBA, ORNL  
12 SEUNG MIN, ACRS  
13 STEVE MINNICK, Exelon  
14 GEARY S. MIZUNO, OGC  
15 ABY MOHSENI, NRR  
16 DAVID NEFF, Exelon  
17 ERIC OESTERLE, NRR  
18 ANDY OLSON, Exelon  
19 MARK ORR, RES  
20 ROGER PEDERSEN, NRR  
21 ROBERT PETTIS, NRR  
22 ALEXANDRA POPOVA, NRR  
23 ALEX PSAROS, Exelon  
24 DIEGO SAENZ, NRR  
25 AARON SANDERS, NRR

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FRED SCHOFER, NRR  
STEVE SMITH, NRR  
ROBERT TAYLOR, NRR  
DAVID TUREK, Exelon  
JAMES TUSAR, Exelon

\*Present via telephone

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T-A-B-L-E O-F C-O-N-T-E-N-T-S

Opening Remarks by ACRS Chairman . . . . . 6

10 CFR 50.46c Rulemaking Activities

Remarks by Subcommittee Chairman . . . . . 7

Briefings by and Discussions With Representatives  
of the NRC Staff Regarding 10 CFR 50.46c Rulemaking  
Activities

Aby Mohseni, NRR . . . . . 9

Jessica Kratchman, NRR . . . . . 10

Paul Clifford, NRR . . . . . 11

C.J. Fong, NRR . . . . . 24

Gordon Clefton, NEI . . . . . 57

Public Comments

Marvin Lewis . . . . . 68

Peach Bottom MELLLLA+ License Amendment Request

Joy Rempe . . . . . 70

Doug Broaddus, NRR . . . . . 71

Rick Ennis, NRR . . . . . 74

David Neff, Exelon . . . . . 81

Jim Armstrong, Exelon . . . . . 83

Andy Olson, Exelon . . . . . 88

David Turek, Exelon . . . . . 90

Draft Final Guide RG 1.127 . . . . . 116

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

8:31 a.m.

CHAIRMAN BLEY: The meeting will now come to order. This is the first day of the 631st meeting of the Advisory Committee on Reactor Safeguards.

During today's meeting the Committee will consider the following: 10 CFR 50.46c rulemaking activities, Peach Bottom MELLLA+ license amendment request, draft final Reg Guide 1.127, and preparation of ACRS reports.

The meeting is being conducted in accordance with the provisions of the Federal Advisory Committee Act. Mr. Christopher Brown is the designated federal officer for the initial portion of the meeting.

We have received no written comments or requests to make oral statements from members of the public regarding today's sessions.

There will be a phone bridge line. To preclude interruption of the meeting the phone will be placed in a listen-in mode during presentations and the Committee discussion.

A transcript of portions of the meeting is being kept and it is requested that the speakers use one of the microphone, identify themselves and speak

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1 with sufficient clarity and volume so that they can be  
2 readily heard.

3 I also want to make folks aware that this  
4 meeting is being web cast with the ability to view our  
5 presentation slides on the web.

6 Those of you out there on the bridge line  
7 who may want to do that can dial into the bridge line  
8 or connect through NRC's public meeting web site and  
9 click on the link. It's worked pretty well in the  
10 past, and from what we've heard the sound is a lot  
11 clearer with less noise if you do the bridge line --  
12 I mean, sorry, if you do the web site rather than the  
13 bridge line.

14 At this point we'll go to our first item  
15 of business, which is 10 CFR 50.46 rulemaking  
16 activities and I'll turn it over to the guy in the  
17 corner, Ron Ballinger.

18 MEMBER BALLINGER: I think thank you, Mr.  
19 Chairman.

20 On November 4th, 2015 our Metallurgy and  
21 Reactor Fuel Subcommittee reviewed the draft final  
22 rule 10 CFR 50.46c and associated Reg Guides 1.222,  
23 223, 224 and 229. The first three Regulatory Guides  
24 provide guidance for meeting the fuel performance  
25 criteria in the new rule. In addition, Reg Guide

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1 1.229 provides guidance for the risk-informed  
2 evaluation of debris effects on long-term cooling.  
3 During that meeting we also had input from industry  
4 and comments from the public on the rulemaking  
5 activities. At the end of that meeting our  
6 Subcommittee recommended that the matter should be  
7 further reviewed during the December 2015 Full  
8 Committee meeting.

9 In that meeting we found the need for  
10 additional discussion on some of the rule requirements  
11 in Reg Guide 1.229, and we've deferred that for a  
12 subsequent meetings in March and April.

13 Today we hear presentations from the NRC  
14 staff and remarks from industry representatives on the  
15 rulemaking activities. This meeting will focus on the  
16 changes to the draft final rule that have been made  
17 since December 2015 Full Committee meeting.

18 I might add that it's been kind of a long  
19 process. I think this started in 2002; am I right,  
20 2002, at which point I think the industry and the  
21 staff were far apart. And now the industry and the  
22 staff have got very good convergence, and they're to  
23 be commended, at least by me, on the efforts that have  
24 been put forward.

25 So now I'll turn the meeting over to

1 Jessica Kratchman to introduce the staff presenters.

2 MR. MOHSENI: If I may, I'm Aby Mohseni,  
3 deputy division director for Policy and Rulemaking.  
4 I will do the intro and I will turn it Jessica right  
5 after that.

6 MEMBER BALLINGER: Okay.

7 MR. MOHSENI: Thank you, Mr. Chairman and  
8 distinguished Committee members for the opportunity to  
9 present to you the 50.46c draft final rule.

10 As you know, this package is the  
11 culmination of many years of research and regulatory  
12 activities. Since 2002, as you said correctly, we  
13 have met with the ACRS 19 times to discuss the  
14 findings of NRC's Fuel Research Program and the  
15 changes to your emergency core cooling requirements  
16 that were made necessary by that research. Today  
17 we'll discuss the changes we've made since our last  
18 meeting in December, which are contained in the  
19 version of the package that provided to you  
20 preparation for this meeting.

21 As you will hear, this package has gone  
22 through inter-office concurrence and has been reviewed  
23 by the Office of General Counsel. But as any large  
24 complex package goes through concurrence at the office  
25 level, changes can occur. Notwithstanding any changes

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1 that that might produce we believe this rule is  
2 technically sound and is ready for your review.

3 We appreciate the effort made by this  
4 Committee over many years to review this rule and we  
5 look forward to the Committee's formal letter.

6 Jessica?

7 MS. KRATCHMAN: Thank you, Aby. And I,  
8 too, would like to thank the ACRS for this  
9 opportunity. My name is Jessica Kratchman. I'm the  
10 NRR project manager for this effort, and I'll keep my  
11 comments brief as I know time is an interest.

12 So my colleagues and I would like to  
13 provide you with a brief update on the activities for  
14 50.46c final rulemaking since we last met.

15 First I'll provide a quick -- oh, you can  
16 go to the next slide, please. Thank you.

17 Since our last ACRS meeting, I'll provide  
18 an update since that meeting on the rulemaking  
19 activities. Then my colleagues Paul Clifford, CJ Fong  
20 and Steve Laur will provide an update to both the ECCS  
21 performance requirements, as well as recent changes to  
22 the risk-informed option for long-term core cooling.

23 Next slide, please. So recent activities  
24 since we last met, we've held a public meeting on  
25 January 19th that went over the implementation

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1 template. It was a public workshop. We had a lot of  
2 public interaction from industry and other  
3 stakeholders, and I believe it was a successful  
4 meeting. Concurrence activities have also continued  
5 since our last interaction. We have completed -- as  
6 Aby stated, the OGC NLO has been achieved, and we have  
7 completed division and inter-office-level  
8 concurrences. And our next steps will be for the EDO  
9 concurrence and submission to the Commission.

10 And with that, I'd like to turn the  
11 meeting over to Paul Clifford.

12 MR. CLIFFORD: Good morning. My name is  
13 Paul Clifford and I'll be describing recent changes to  
14 the ECCS performance requirements, the deterministic  
15 portion of it, and then I'll be followed by CJ, who  
16 will be talking about the risk-informed portion.

17 There was a red line strikeout provided in  
18 preparation for this meeting that showed the  
19 differences between the package that was provided, the  
20 rule language package that was provided in October in  
21 preparation for the November Subcommittee meeting and  
22 what is considered final today.

23 The first thing you may notice is there  
24 were a dozen or so editorial changes that have no  
25 impact on the ECCS performance requirements.

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1           There were only two changes to the  
2 deterministic aspects of the rule. The first was  
3 paragraph (m)(1), Reporting. You may recall that  
4 during the Subcommittee meeting in November there were  
5 some discussions, the industry had some latent  
6 concerns about the reporting requirements. So the  
7 meeting was in November. So later on that month we  
8 had a last-minute public workshop/webinar to try to  
9 resolve the industry's final comments.

10           The meeting was successful. We managed to  
11 come to agreement on what a slight revision to the  
12 rule language would be. It doesn't change what the  
13 actual requirements were, but it certainly clarifies  
14 the flexibility with respect to defining the scope of  
15 the reanalysis and the schedule for the reanalysis.  
16 It's not all presented right here. You guys have the  
17 red line strikeout. So it's (m)(1)(i), (m)(1)(ii),  
18 and (m)(1)(iii).

19           MEMBER SKILLMAN: Paul, you said that that  
20 meeting was successful.

21           MR. CLIFFORD: Yes.

22           MEMBER SKILLMAN: Does that mean that each  
23 bludgeoned the other until neither was speaking?

24           (Laughter.)

25           MEMBER SKILLMAN: Or was that an amicable

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1 engagement where both sides said, hey, this is what we  
2 can support and this is the right thing to do?

3 MR. CLIFFORD: I believe it was the  
4 latter.

5 (Laughter.)

6 MR. CLIFFORD: No, I believe we've  
7 softened some of the words. Before there were words  
8 that could be construed as requiring complete  
9 reanalysis as opposed to an estimation of what the  
10 change was. And that was kind of a sticking point,  
11 because up until now they had the same flexibility of  
12 estimating what the effect is.

13 MEMBER SKILLMAN: And the other was the  
14 timing?

15 MR. MOHSENI: And the timing, correct. So  
16 we've addressed both of those, which you'll see with  
17 the strikeouts. And that's a good follow-up question  
18 when Gordon gets up here to ask him if he's happy with  
19 them. As far as I'm concerned I think the industry's  
20 happy with the changes.

21 MEMBER SKILLMAN: Yes, sir. Thank you,  
22 Paul.

23 MR. CLIFFORD: And the other change is  
24 paragraph (n). It's part of the reporting. It's the  
25 definition of what is a significant change. In the

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1 proposed rule the definition of a significant change  
2 with respect to calculated ECR was 0.4 percent ECR.

3 We received a public comment that said it  
4 was it was a little too tight and they wanted a little  
5 relaxation. We went back and did some calculations  
6 and we agree that we could relax that 1.0 percent ECR.

7 And that was it for the changes. Not a  
8 lot.

9 I'd like to finish with the conclusions.  
10 This is the same conclusions page I had in the  
11 Subcommittee and the Full Committee and I think it's  
12 important to kind of rehash this as you guys are  
13 getting ready to write the letter. With or without  
14 50.46c the research findings must be incorporated into  
15 the existing fleet to ensure adequate protection. And  
16 we believe that rulemaking is the most effective way  
17 to incorporate those research findings.

18 The staff's safety assessment, which has  
19 been updated annually, supports the NRC decision to  
20 pursue rulemaking, and it also pursues a flexible and  
21 efficient implementation plan that extends out seven  
22 years, but it doesn't replace the need for rulemaking.  
23 The staff has conducted many, many public workshops  
24 and webinars to encourage stakeholder involvement over  
25 the past 10, 12 years. And there have been many

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1 changes to the SOC, the rule language and to the full  
2 Reg Guides to improve the clarity, expand flexibility  
3 and reduce the burden to the industry.

4 VICE CHAIR CORRADINI: So, Paul, the one  
5 thing -- since it's been at least 10 years, a dozen I  
6 guess you're probably closer, what have you been doing  
7 in the interim on a case-by-case review of new fuel?  
8 How have you dealt with it to deal with bullet one?

9 MR. CLIFFORD: When we reviewed new fuel  
10 or --

11 VICE CHAIR CORRADINI: Well, you said with  
12 or without the rule the findings have to be  
13 incorporated.

14 MR. CLIFFORD: Right.

15 VICE CHAIR CORRADINI: But given that this  
16 has been going on for a dozen years --

17 MR. CLIFFORD: Right.

18 VICE CHAIR CORRADINI: -- you've already  
19 been considering it in some fashion how?

20 MR. CLIFFORD: Well --

21 VICE CHAIR CORRADINI: Or has none of the  
22 industry taken up any of the cladding materials that  
23 would have --

24 MR. CLIFFORD: Well, certainly --

25 VICE CHAIR CORRADINI: -- or gone beyond

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1 the burnup that would have gotten --

2 MR. CLIFFORD: Right. So there hasn't  
3 been an increase in burnup or allowable corrosion  
4 since we've started this process.

5 VICE CHAIR CORRADINI: Okay.

6 MR. CLIFFORD: And also in general the  
7 industry is moving towards improved cladding materials  
8 that have much less corrosion, so the corrosion  
9 effects become smaller and smaller. But we have  
10 maintained an annual update to a plant-by-plant-  
11 specific safety assessment. So we are tracking safety  
12 margins. But that's something that we're doing in  
13 house. That's not regulated. It's not enforced with  
14 the plant. It's not tracked by tech specs or limited  
15 by tech specs, or even in the plant FSARs.

16 VICE CHAIR CORRADINI: So it's just --

17 MR. CLIFFORD: It's something we're doing  
18 to provide us with a level of assurance that we can  
19 take this long to go through the rulemaking process  
20 and to implement that.

21 VICE CHAIR CORRADINI: Okay.

22 MR. CLIFFORD: That's it. A quick  
23 presentation.

24 MEMBER BALLINGER: Questions?

25 MR. CLIFFORD: There's another

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1 presentation.

2 MEMBER BALLINGER: There's another  
3 presentation?

4 MR. CLIFFORD: Okay.

5 MEMBER POWERS: Well, maybe you could just  
6 expand it a little bit on the 0.4 to 1 percent on the  
7 corrosion allowance that you're allowing there. You  
8 said you'd done some calculations.

9 MR. CLIFFORD: Okay. So if you use a  
10 typical PWR 17 by 17 cladding and you use a simplified  
11 temperature profile and you do it at 2,000 degrees  
12 Fahrenheit as a peak. So you have a certain time that  
13 it takes you to get to 17 percent ECR at that  
14 temperature. If you then change that by 50 degrees  
15 plus or minus -- because the definition of significant  
16 for temperature is 50 degrees. So we looked at  
17 different temperatures plus or minus 50. Everything  
18 else being the same. And we looked at what the delta  
19 ECR was. And the delta ECR changes with temperature,  
20 but one percent is a reasonable different that  
21 corresponds to 50 degrees Fahrenheit. That's how we  
22 came up with it.

23 VICE CHAIR CORRADINI: And while he's  
24 thinking, and 2,000 is where you get to the one  
25 percent? Because as you said, as I change the base

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1 temperature and do the plus or minus the ECR changes.

2 MR. CLIFFORD: We're looking for a delta.  
3 And we have a definition of significant on a delta of  
4 50 degrees ECR. So we wanted to maintain the same  
5 level of significance for ECR. So it's not a maximum  
6 of one percent. It's the change in ECR. So if you  
7 do --

8 (Simultaneous speaking.)

9 VICE CHAIR CORRADINI: I understand that.  
10 I understand that the delta was one.

11 MR. CLIFFORD: Right. So you might get to  
12 6½ percent ECR if you assume 2,000. And if you assume  
13 1,950, you might get to 5.5. And if you assume 2,050,  
14 you might get to --

15 VICE CHAIR CORRADINI: Okay.

16 MR. CLIFFORD: -- 7.5. So the delta is  
17 about one percent as you change by 50 degrees on the  
18 same temperature profile. But increased or decreased  
19 by 50 degrees.

20 VICE CHAIR CORRADINI: Okay.

21 MEMBER BALLINGER: And this is  
22 irrespective of cladding type?

23 MR. CLIFFORD: No, no. A 50-degree change  
24 would change ECR depending on what temperature. If  
25 you were at 2,150 and you went to 2,200, there would

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1 be a higher change in ECR because you're at a higher  
2 temperature. And if you were at 1,800 and you went to  
3 1,850, it would be a much lower change in ECR. So the  
4 one percent is just a good reasonable number

5 MEMBER BALLINGER: What's the difference  
6 between Zircaloy-4 and M5 in ZIRLO, for example?

7 MR. CLIFFORD: Well, there isn't, because  
8 this was all done.

9 MEMBER BALLINGER: Oh, okay.

10 MEMBER POWERS: I mean, they're just not  
11 very sensitive to alloying agents at this temperature.

12 MEMBER BALLINGER: I can't hear you.

13 MEMBER POWERS: At this temperature the  
14 oxidation kinetics just aren't very sensitive to  
15 alloying at two percent levels.

16 MR. CLIFFORD: So the one percent is just  
17 a reasonable threshold where you cross from a 60-day  
18 reporting requirement to an annual reporting  
19 requirement. So the staff felt that if you found an  
20 error and that error resulted in more than a one  
21 percent change, that was a reasonable threshold to put  
22 you into a 60-day reporting period. It's a lot of  
23 engineering judgment, but it's based on some  
24 calculations at reasonable temperatures.

25 MEMBER BALLINGER: Thank you.

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1 MR. CLIFFORD: No problem.

2 MEMBER BROWN: In looking over some of the  
3 material, I guess my question is on the breakaway  
4 oxidation behavior, in that there's now a requirement  
5 that you do in fuels, that you do a test on every  
6 ingot or what have you. Whether it's a new fuel, I'm  
7 not clear. But yet there was a lot of discussion  
8 about nobody's -- other than this Russian fuel that  
9 nobody's ever really seen it, and yet now we've  
10 incorporated a new requirement for a phenomenon that  
11 hasn't been observed for -- other than in some testing  
12 situations that has not been observed in the real world  
13 for I don't know how long. This is an old fuel  
14 that --

15 MR. CLIFFORD: Right.

16 MEMBER BROWN: So I guess I didn't quite  
17 understand the reason for segueing into a more  
18 extensive testing program when there were arguments  
19 that the composition, the process and everything else  
20 kind of prevented this, but yet now we're going to  
21 test anyway.

22 MR. CLIFFORD: Okay. That's a very good  
23 point. So the original proposed rule required that  
24 you do testing every reload. And first of all,  
25 there's an initial quantification testing of a new

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1 alloy to determine its breakaway performance. And  
2 then there's confirmatory every reload. And it was  
3 going to be reported by each licensee.

4 We got a lot of comments, as you  
5 mentioned. And so we accepted all of the comments we  
6 received and we relaxed the requirement. So there's  
7 now no reporting requirement and there's no defined  
8 periodicity for confirmatory testing. Confirmatory  
9 testing must be performed, but the rule does not  
10 require when or how frequent you perform those tests.  
11 So we're providing the industry with all the  
12 flexibility they want to define a Quality Assurance  
13 Program within their manufacturing facilities, and  
14 then along with that define what the confirmatory  
15 testing period would be.

16 So they could say I would run a test once  
17 a year, once every five years. I would tie it to  
18 quality control or when I'm changing belt sandings or  
19 changing ingot material. I wish I'd brought my backup  
20 slides, but in my backup slides I showed all the  
21 process steps that were involved in zirconium and  
22 said, well, where does the NRC want to get involved in  
23 this process?

24 The industry has the flexibility to say we  
25 will follow a very regimented process, and because

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1 we're doing that process the period of confirmatory  
2 testing can be very broad. But if I don't want the  
3 NRC involved in my shop at all and I don't want to  
4 define each and every step, then I run tests more  
5 frequently. So that per ingot was in the Reg Guide  
6 and it's just one acceptable way to make the rule, but  
7 the rule does not specify a frequency.

8 MEMBER BROWN: Okay. So in fact after  
9 he's done his initial new fuel testing to determine  
10 the susceptibility or what have you --

11 MR. CLIFFORD: Right.

12 MEMBER BROWN: -- effectively the fuel  
13 manufacturer could say I'm going to do it once every  
14 10 years as I'm manufacturing this fuel over some  
15 period of time as people request it or order it.

16 MR. CLIFFORD: The rule would allow that.  
17 They would need to justify that and --

18 (Simultaneous speaking.)

19 MEMBER BROWN: I understand. That's fine,  
20 but they have the ability to do that. And I guess  
21 because you're allowing that type of determination --  
22 is it -- I'm sure it's not automatic, but a reasonable  
23 request will be accepted --

24 MR. CLIFFORD: Absolutely.

25 MEMBER BROWN: -- I would imagine.

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1 MR. CLIFFORD: Yes.

2 MEMBER BROWN: Okay. That was the only  
3 real question I had based on reading all this stuff,  
4 so I'll pass on now.

5 MEMBER BALLINGER: Now, am I hearing you  
6 say; I want to get this clear, that you will allow an  
7 argument for including satisfying the breakaway  
8 oxidation requirement as part of the normal quality  
9 assurance and quality control process for the vendors?

10 MEMBER BROWN: That's what he said.

11 MR. CLIFFORD: If --

12 (Simultaneous speaking.)

13 MEMBER BALLINGER: That's what I heard him  
14 say.

15 (Simultaneous speaking.)

16 MR. CLIFFORD: -- get down to the level  
17 specifying each and every part of the fabrication  
18 process and can justify that they're not -- can commit  
19 to not changing those; and we're going all the way  
20 back to source material now, then yes.

21 MEMBER BALLINGER: Okay. Thank you.

22 MR. CLIFFORD: And I'm not sure anybody's  
23 going to want to commit to that level of scrutiny and  
24 regulation, but it's open.

25 MEMBER BALLINGER: So what you're saying

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1 is that if the vendor adjusts their quality control  
2 procedures and processes to -- they can adjust it to  
3 comply with the rule?

4 MR. CLIFFORD: Absolutely.

5 MEMBER BALLINGER: Okay.

6 MR. CLIFFORD: And that's what we expect  
7 they would do.

8 MEMBER BALLINGER: Thank you.

9 MR. CLIFFORD: Okay. Well, I'll turn this  
10 over to my colleague CJ to talk about the risk-  
11 informed portion.

12 MR. FONG: Thanks, Paul. I appreciate you  
13 leaving me some extra time to get bludgeoned here.  
14 But I'll try to be pretty crisp, too, Mr. Chairman.

15 We're here today to talk about the risk-  
16 informed portion of the rule, which of course is an  
17 optional piece of the regulation that licensees can  
18 use to risk-inform the treatment of debris. And I'm  
19 here to discuss two specific changes that have taken  
20 place to the rule language.

21 The first is the change that was  
22 identified via the NRC's non-concurrence process.

23 CHAIRMAN BLEY: CJ?

24 MR. FONG: Yes?

25 CHAIRMAN BLEY: Excuse me just a minute.

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1 MR. FONG: Sure.

2 CHAIRMAN BLEY: I'm sure we all remember,  
3 but just in case --

4 MR. FONG: Okay.

5 CHAIRMAN BLEY: -- for the Committee, we  
6 agreed that the Reg Guide we'd look at some point in  
7 the future.

8 MR. FONG: Ah, yes.

9 CHAIRMAN BLEY: And we've done that. So  
10 all we're really talking about is language that's in  
11 the rule in this area today.

12 MR. FONG: Right. Yes, and there's going  
13 to be a Subcommittee meeting March 22nd and a Full  
14 ACRS meeting on April 7th to talk about Reg Guide  
15 1.229, which has those specifics. Yes, thank you.

16 But there have been two changes to the  
17 rule language, and as I said one was the change  
18 identified via the non-concurrence process about the  
19 circumstances under which a licensee can select the  
20 risk-informed option. We'll get into that.

21 And the second change was a change to the  
22 process pertaining to methods and how licensees can  
23 change methods after subsequent successful adoption of  
24 the rule.

25 Next slide, please. So the first issue

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1 that was raised, the non-concurring individual brought  
2 up this issue and he said should we really be allowing  
3 the risk-informed option for intentional design  
4 changes to the existing fleet where someone has  
5 deterministically demonstrated that debris is not an  
6 issue, then down the road they want to intentionally  
7 introduce a problematic debris source? Would the  
8 risk-informed option really be appropriate for them?  
9 And similarly, what about a new reactor? Could  
10 somebody come out and design a new reactor and invoke  
11 the risk-informed option right off the bat?

12 And so this issue was entered into our  
13 non-concurrence process or program in September. It  
14 sparked a number of discussions both at the working  
15 group level and ultimately involved the steering  
16 committee of senior management.

17 Next slide. And so there were a number of  
18 issues that were -- or a number of I guess  
19 considerations. Some of those were discussed at the  
20 December Full Committee meeting. I think the one I  
21 really want to focus on here though is we really kind  
22 of wanted to go back to what the guidance says, go  
23 back to so-called first principles. And I think the  
24 most compelling argument was that Reg Guide 1.174 does  
25 allow the use of a risk-informed decision making

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1 process to increase risk, but the benefits of that  
2 risk increase should be clearly identified and should  
3 be commensurate with the proposed risk increase.

4 And so for the existing proposed use of  
5 the rule; i.e., to resolve GSI 191 or to respond to  
6 Generic Letter 2004-02, the Commission in effect  
7 identified those benefits for us. They said, hey,  
8 we're mindful of dose, we're mindful of operational  
9 considerations. Staff, go forth and develop a risk-  
10 informed option to address this issue.

11 Next slide. For new reactors, on the  
12 other hand, or for an existing reactor that had solved  
13 this problem and then down the road wanted to  
14 introduce a bunch of debris, we felt that the benefits  
15 identified by the Commission wouldn't be applicable  
16 there. Obviously, if you're a new reactor, there's no  
17 occupational dose associated with changing your  
18 insulation type. You haven't built anything yet.

19 And so, we felt that we didn't want to  
20 close the door on those entities, but the onus would  
21 be on them, the burden would be on them to identify  
22 what's the benefit? You're going to have a risk  
23 increase; that's acceptable according to the guidance,  
24 but you need to identify what benefit is being  
25 obtained.

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1           So we made a change to the rule language  
2 just to make that clear.

3           And if you'd go to the next slide, Paul.

4           I'm not going to read this word for word,  
5 but we agreed on some consensus language that would  
6 again allow the use of the risk-informed option for  
7 those folks, but make it clear then that they would be  
8 required to identify what the significant safety or  
9 security issue was and why it couldn't be addressed by  
10 other means. So identifying what benefit would be  
11 associated with invoking the risk-informed option.

12           So that's the first issue that led to a  
13 change.

14           VICE CHAIR CORRADINI: But in your minds  
15 nothing rises to that that you can think of?

16           MR. FONG: That's right. We haven't  
17 thought of that situation yet, but again it's hard to  
18 imagine all the possibilities. We wanted to leave  
19 that open, but we wanted to put the burden on the  
20 licensee to do that.

21           MEMBER BALLINGER: Now what about the sort  
22 of gray area case where there's a plant that's in  
23 operation that has solved the GSI 191 issue?

24           MR. FONG: Deterministically?

25           MEMBER BALLINGER: Deterministically.

1 MR. FONG: Right.

2 MEMBER BALLINGER: And they're operating  
3 along and all of a sudden they discover that they let  
4 something out, or there's a source that they hadn't  
5 accounted for. Now what can they do?

6 MR. FONG: Well, they've got several  
7 options. If they can demonstrate that the existing  
8 deterministic program bounds that new issue --

9 (Simultaneous speaking.)

10 MEMBER BALLINGER: That's what they would  
11 try first?

12 MR. FONG: Yes, I think that's what people  
13 would try to do first. If they can't do that --  
14 that's what we're saying here. We've crafted the  
15 language so that we wouldn't slam the door on that  
16 situation. We would certainly consider the risk-  
17 informed option, but I think we'd want to know, hey,  
18 why can't this be resolved using your existing  
19 response to the generic letter; i.e., a deterministic  
20 method?

21 MEMBER STETKAR: You can use analogies to  
22 things like fire protection. People have  
23 deterministically met Appendix R in fire protection  
24 and then they discover things that, for example, don't  
25 and they've invoked risk-informed --

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1 MR. FONG: Okay.

2 MEMBER STETKAR: -- bases for that. So  
3 there's precedent.

4 CHAIRMAN BLEY: This comes up in our  
5 discussions with the staff every time that word shows  
6 up, "practicable."

7 MR. FONG: Yes.

8 CHAIRMAN BLEY: And maybe you've got  
9 somebody from OGC here today. The dictionary  
10 definition of "practicable" essentially is it possible  
11 to do? Can it be done? Usually you mean practical,  
12 that it's a reasonable kind of thing. And practicable  
13 isn't the word that does that unless there's some  
14 established legal meaning for it that's different from  
15 the every day.

16 MR. FONG: Well, Mr. Chairman, we have  
17 lawyers here, but I actually did some homework on  
18 this, and --

19 CHAIRMAN BLEY: Okay.

20 MR. FONG: -- my dictionary says  
21 "practicable" is another way to say "feasible."

22 CHAIRMAN BLEY: Yes, that's right.

23 MR. FONG: So I thought that was  
24 appropriate for here.

25 CHAIRMAN BLEY: Feasible. That means you

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1 can do it. So no matter what it costs, you can do it.  
2 I agree. That's what my dictionary says, too.

3 (Laughter.)

4 MEMBER STETKAR: It is feasible to put a  
5 man on Mars. We know how to do that.

6 MEMBER BALLINGER: We've seen the movie.

7 (Laughter.)

8 MEMBER STETKAR: Seriously, we have the  
9 technology to do it. It is practicable, it is  
10 feasible. It is feasible. So this says unless it is  
11 completely infeasible impossible to do, that's the  
12 only case that you'll allow them.

13 CHAIRMAN BLEY: But you mean feasible.  
14 That's what you want it to mean. If it's possible for  
15 them to do it --

16 MR. FONG: I want it to mean practicable.

17 (Laughter.)

18 MEMBER STETKAR: So for example, if they  
19 identify a fire issue and that fire issue requires  
20 them to completely move everything in the containment,  
21 everything, but it's possible to do that, that is the  
22 -- rather than putting in some sort of fire retardant  
23 material that might not necessarily satisfy the debris  
24 requirements, you would require them to move  
25 everything in the containment? You would not allow

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1 them to use a risk-informed argument about the fire  
2 retardant?

3 MR. FONG: Well, no, this --

4 MEMBER STETKAR: That's what this says --

5 MR. FONG: Yes.

6 MEMBER STETKAR: -- and that's what you  
7 just said on the record.

8 MR. FONG: I think there's got to be some  
9 judgment applied. I think that the intent here was to  
10 have sort of a reasonableness standard applied to  
11 these decisions going down the road.

12 MEMBER STETKAR: I think that's what Dr.  
13 Bley meant by the term "practical" rather than  
14 "practicable" or "feasible."

15 MEMBER BANERJEE: You know the words have  
16 risen before with regard to containment accident  
17 pressure, and they've been very difficult to  
18 interpret.

19 CHAIRMAN BLEY: They weren't interpreted.

20 MEMBER BANERJEE: What?

21 CHAIRMAN BLEY: We never got it  
22 interpreted.

23 MEMBER BANERJEE: Well, the Commission  
24 handed down a ruling at one point.

25 So I think practicable is somewhere

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1 between feasible and practical, but that's how we sort  
2 of looked at it for containment accident pressure.  
3 But as Dennis says, there's no clear definition of it.

4 CHAIRMAN BLEY: You guys and the licensees  
5 have to live with it. So that's all I wanted to do  
6 was point it out to you.

7 MR. FONG: Okay. Thanks.

8 MEMBER BALLINGER: I mean, back to this  
9 again, if it's easily addressed, why not just change  
10 the language to make it clear?

11 MR. FONG: I think we could take a second  
12 look at it, sure.

13 MEMBER BALLINGER: I mean, it seems to me  
14 like everybody's in agreement on what the sort of  
15 revised definition of "practicable" should be in this  
16 case.

17 CHAIRMAN BLEY: "Reasonable" is a word  
18 that keeps coming up.

19 MEMBER BALLINGER: "Reasonable" is the  
20 word that keeps coming up, and Dennis has mentioned it  
21 -- I don't know, I lost count of the number of times  
22 he has.

23 MR. FONG: All right. We can take a  
24 second look at it. I think we --

25 VICE CHAIR CORRADINI: You don't have to

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1 agree to what we're asking.

2 MR. FONG: Yes, we'd looked at practical  
3 versus practicable. And maybe I will ask Geary to  
4 come chime in, but I guess our read on it was that  
5 "practical" meant there was a benefit. And clearly  
6 there is a benefit to the licensee, but we also wanted  
7 to make sure that there was a reasonableness component  
8 to what we we're requiring.

9 MEMBER BALLINGER: I mean, we just need to  
10 be careful that right now -- we started in 2002; now  
11 we're in 2016, and 10 years from now when there's a  
12 changeover of people and things, people's idea of what  
13 a definition is might change. So we need to be as  
14 clear as we possibly can, I think.

15 MR. MIZUNO: Okay. So this is Geary  
16 Mizuno, Office of General Counsel for the NRC. And  
17 the additional aspect that practicable brings to the  
18 table and to the language here, which isn't captured  
19 by practical is I think -- CJ just mentioned it in  
20 passing just now, which is that there needs to be some  
21 kind of reason for doing that.

22 Yes, it's practical to go to Mars. I  
23 mean, we know the technology exists. I saw *The*  
24 *Martian*. I read *The Case for Mars*. I mean, we can do  
25 it. But is there a reason to go there? Is there some

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1 kind of economic or strategic or scientific reason to  
2 go there that is compelling enough such that you're  
3 going to harness the considerable resources needed to  
4 do that? Practicable, at least looking at it from the  
5 legal standpoint and looking at the way that the  
6 courts and people have used that word, has that  
7 additional -- and I want to call it the additional  
8 aspect that there has to be some kind of need, not  
9 simply that it is a technically feasible to do.

10 CHAIRMAN BLEY: That's what I was getting  
11 at. If there's a legal basis, it's different than the  
12 common language. That's what I wanted to hear. And  
13 if there is, that's great.

14 MR. MIZUNO: It would have to be that.  
15 That's what staff was trying to capture here.

16 CHAIRMAN BLEY: Okay.

17 MR. FONG: Okay. Thank you, Geary.

18 Moving on to No. 2.

19 MEMBER BALLINGER: You thought you had  
20 enough time.

21 MR. FONG: It's scary when the lawyers  
22 have to bail you out.

23 (Laughter.)

24 MR. FONG: Okay. Issue No. 2 was raised  
25 actually during the December meeting. And the

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1 question came up if the licensee successfully adopts  
2 the risk-informed option, 50.46c(e), should all method  
3 changes require NRC approval? A strict reading of the  
4 language you could conclude that any kind of a method  
5 change, even something sort of small, the licensee  
6 would need to come in with a license amendment  
7 request. And we committed -- I was sitting up here.  
8 I committed to go back and re-look at the language.

9           Next slide, please. When we did that our  
10 intent was always to ensure that the methods that were  
11 key to the decision were reviewed and accepted, and  
12 but down the road there would be a process to ensure  
13 that licensees would not be using tried and true  
14 methods to get their foot in the door and then after  
15 they got approval switch to less-credible methods.  
16 The intent was not to require NRC approval for every  
17 small little change that a licensee might want to  
18 make.

19           So one example was the standby failure  
20 rate. Another example might be changing from multiple  
21 Greek letter to alpha factor. Clearly, we don't want  
22 someone coming in with a LAR for those kind of  
23 changes. So how do we strike a balance?

24           Next slide. This analysis is kind of  
25 unique because there's a lot that goes into it. And

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1 we felt that it wasn't practical --

2 (Laughter.)

3 MR. FONG: -- or maybe there's another  
4 word that might be better here, but we didn't want to  
5 try to define all -- have a massive list of all  
6 methods going down from coatings to debris zones of  
7 influence to LOCA frequencies. Defining that up front  
8 we felt would be a challenge. So we decided instead  
9 to change the language so that the staff would impose  
10 a license condition identifying which methods can be  
11 changed without NRC approval and which can't. And  
12 that's consistent with what we've done in some other  
13 areas. For example, 50.69, which is risk-informed SSE  
14 categorization.

15 We also wanted though to give ourselves  
16 some confidence that this method would be viable, so  
17 we went through some of the initial submittals that we  
18 have. For example, the South Texas Pilot. And we  
19 challenged ourselves, can we look at the methods  
20 they're using and see which ones, yes, we'd be okay  
21 with a change down the road by the license or, no, if  
22 the licensee wants to make a change, we want that to  
23 come to the staff.

24 VICE CHAIR CORRADINI: So can I say that  
25 back to you?

1 MR. FONG: Yes.

2 VICE CHAIR CORRADINI: So you're saying;  
3 and you use South Texas as an example, South Texas has  
4 a method. And eventually you approve that method.  
5 You're going to go through that method and in steps 1,  
6 2 and 3, yes, they can change it, but steps 4, 5 and  
7 6 they got to come back to the staff?

8 MR. FONG: Correct. And again, we've done  
9 that in that other areas. 50.69 is a good example.  
10 If you look at the Vogtle 50.69 LAR, there's a table  
11 that says these methods are very, very important.  
12 Staff approves what you did here, but if you want to  
13 change that say by going from a seismic margins  
14 analysis to a seismic PRA or vice-versa, staff would  
15 want to take a look at that.

16 VICE CHAIR CORRADINI: So what are other  
17 options you were considering before you settled on  
18 this one, because this one seems unusual --

19 MR. FONG: Well, if you go --

20 VICE CHAIR CORRADINI: -- for want of a  
21 better word.

22 MR. FONG: Sure, Dr. Corradini. I'll show  
23 you the next slide. This is what the language used to  
24 say, and it basically said any changes --

25 (Simultaneous speaking.)

1 VICE CHAIR CORRADINI: Yes, that's  
2 clearly --

3 (Simultaneous speaking.)

4 MR. FONG: So that's kind of one end of  
5 the spectrum where we didn't want to be. The other  
6 end of the spectrum might be to just be silent on the  
7 whole process and say, hey, just get approved and  
8 change stuff down the road as you see fit. And we  
9 didn't want to do that either. We felt there are some  
10 methods that the staff wants to take a second look at  
11 if they're changed.

12 VICE CHAIR CORRADINI: So just for my  
13 memory, can we take a step back? The only way the  
14 licensee could enter into a risk-informed is they  
15 can't meet the deterministic?

16 MR. FONG: Well, I --

17 VICE CHAIR CORRADINI: Because they can't  
18 back into it. We just went over that language. So I  
19 can't back into it because I would add -- I found a  
20 mistake or I wanted to put in new material, the only  
21 way I would enter into risk-informed in this is  
22 because I can't meet the determination.

23 MR. FONG: I wouldn't say it that way,  
24 because licensees responded to Generic Letter 2004-02  
25 and one of the options was to go risk-informed. An

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1 entry point to the risk-informed is not, hey, you  
2 couldn't get there deterministically.

3 VICE CHAIR CORRADINI: But they chose it?

4 MR. FONG: They chose it. They responded  
5 on the docket in writing to the staff explaining what  
6 method they chose. That's the entry point. So some  
7 licensees might have -- maybe you could argue they  
8 could have done it deterministically, but they made  
9 the initial decision to go risk-informed.

10 VICE CHAIR CORRADINI: Okay. So I'm sure  
11 the risk-informed people here are going to correct me  
12 that I'm off in left field here, but it seems to me a  
13 logical thing would be we're going to approve the  
14 method and then down the road if you change the method  
15 and all of a sudden you're starting to see an  
16 allowable difference in debris, there's some trigger  
17 amount that you'd go back and look at the method. It  
18 would seem to me that's a heck of lot more logical  
19 than saying steps 1, 2 and 3 are okay to do whatever  
20 you want and 4, 5 and 6 --

21 MEMBER STETKAR: That's what I was going  
22 to ask about, because just carte blanche on the method  
23 -- if you use -- I use the standby failure rate versus  
24 demand probability, something that's kind of divorced  
25 from this. But in certain applications that

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1 particular method might be sensitive to the results,  
2 whereas in a different application there may be very  
3 small sensitivity on that method. So just saying  
4 that, well, there might be sensitivities, so we want  
5 to disallow changes to that particular method on a  
6 case-by-case basis has to have some sort of  
7 performance-based --

8 MR. FONG: It is.

9 MEMBER STETKAR: -- trigger on it.

10 MR. FONG: I think maybe we're saying  
11 something similar, because that's why we declined --  
12 we first looked at -- maybe we could just come up with  
13 five or six methods that are so important they  
14 shouldn't be allowed to be changed. But as you  
15 pointed out, that really varies from application to  
16 application.

17 MEMBER STETKAR: Exactly.

18 MR. FONG: For one licensee say the zone  
19 of influence there's an 11 need zone of influence for  
20 some materials. For some applications that might be  
21 a huge deal. The whole thing could hinge on that.  
22 Whereas for other applicants not that big of a deal.

23 MEMBER STETKAR: Right.

24 MR. FONG: And so that's why we wanted to  
25 evaluate each on a case-by-case basis. We've been

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1 reviewing the South Texas Pilot now for some time.  
2 We've got a familiarity with it. We think we the  
3 staff can reasonably determine, hey, these are the  
4 heavy hitters that we should keep a close eye on.  
5 These other ones are within the licensee's purview as  
6 far as changing.

7 VICE CHAIR CORRADINI: Okay. But if you  
8 know that, why not simply look at a trigger point and  
9 change in the allowable as the point where you start  
10 looking versus actually going through the 10-step  
11 method and say these four you can do with, but these  
12 six we've got to look at before you do anything? That  
13 strikes me as a bit too much into the weeds. It seems  
14 to me there would be some sort of delta on the overall  
15 result, and if that delta gets too big, then you start  
16 going, hmm, now did they do that? Let's go look.  
17 Because then, as you said, you already know that --  
18 what you called the heavy hitters, the things that  
19 most influence the result anyway.

20 MR. FONG: I think, if I'm understanding  
21 your suggestion correctly, that's certainly some  
22 merit. I think one of the challenges might be  
23 defining what the unit or metric might be. Would it  
24 be pounds of debris? Would it be delta CDF? Pounds  
25 of coatings? There's kind of a lot that goes into

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1 this.

2 VICE CHAIR CORRADINI: Right.

3 MR. FONG: But I think it would be hard to  
4 define, unlike on the fuel side where you can say,  
5 okay, 50 degrees is sort of a line. We looked at  
6 several options for doing that with debris, and it's  
7 difficult because there's so many different components  
8 to the final product. And we felt like given some of  
9 our experience in NFP 805 space, when you start  
10 getting risk metrics that are down in the 10 to the  
11 minus 7 range, that that sort of creates a bunch of  
12 other unforeseen challenges.

13 VICE CHAIR CORRADINI: So I don't know  
14 what I can and can't say in open session, but I  
15 thought there was some sort of temperature above which  
16 people started worrying in terms of in-core; I'm  
17 looking at Professor Banerjee, that when we saw  
18 certain vendors and certain analyses and certain  
19 experiments there was a temperature above which I  
20 started getting concerned. And if I was below that,  
21 based on debris or chemical form or all the stuff I  
22 can't remember, things were okay. So I would think it  
23 eventually go back to temperature of the fuel.  
24 Cladding. Or surface.

25 The only reason I'm asking -- and I'll

1 stop, but the only reason I'm asking is this just  
2 seems -- just at first blush this seems a lot more in  
3 the weeds than I'd expect for a risk-informed  
4 approach. It seems you'd use the rolled-up risk-  
5 informed calculation to help tell you when something  
6 is so large of change you've got to go back, look at  
7 the method and figure out what they did.

8 MEMBER BANERJEE: I think the problem is  
9 that whereas it's fairly clear how you determine the  
10 temperature in a LOCA calculation or something.  
11 Everything's very prescribed and you go through it and  
12 you do best estimate uncertainty, whatever. Here the  
13 temperature, which will remain nameless, is a decent  
14 amount, is not that easy to calculate. There's a lot  
15 more judgment that goes into it. And it's simply  
16 because we can't do the same type of best estimate  
17 calculations. Otherwise, you could use risk-informed  
18 all the time.

19 VICE CHAIR CORRADINI: I agree with you.

20 MEMBER BANERJEE: Yes.

21 VICE CHAIR CORRADINI: And you know much  
22 more than I. But on the other hand, there are other  
23 applications where that same similar sort of  
24 temperature, to be named nameless, when I cross it,  
25 staff gets nervous. So that means I have some sort of

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1 expected bound. And if I start seeing I cross above  
2 it, then I start looking at the method versus --

3 MEMBER BANERJEE: What you're saying is  
4 use it as a trigger --

5 VICE CHAIR CORRADINI: Yes, use it as a  
6 trigger.

7 MEMBER BANERJEE: -- rather than --

8 VICE CHAIR CORRADINI: Use it as a  
9 trigger. I'm not sure what it is, but use it as a  
10 trigger. Then if the licensee comes in with some  
11 change and that causes some difference, then you say,  
12 okay, now I got to --

13 MEMBER BANERJEE: I think what the staff  
14 has done, though, is it's -- instead of trying to --  
15 (Simultaneous speaking.)

16 VICE CHAIR CORRADINI: They've gone  
17 further down inside.

18 MEMBER BANERJEE: Yes. The staff can  
19 correct me, but they've gone further upstream of  
20 that --

21 VICE CHAIR CORRADINI: Correct.

22 MEMBER BANERJEE: -- and tried to set  
23 criteria, which then serves as a surrogate for what  
24 you're saying.

25 VICE CHAIR CORRADINI: Right.

1                   MEMBER BANERJEE: And there are a few of  
2 those which possibly -- I think there's merit in what  
3 Mike is saying, because you could look at something  
4 which affects those surrogates, whatever they are, but  
5 I don't want to talk about -- I don't know where the  
6 borders of proprietary stuff and open stuff is here.

7                   But let's say one of those surrogates is  
8 strongly affected, such as let's say the fiber loading  
9 per channel, okay, that's carried. And then you could  
10 say, well, yes, okay, if this is affected by so much;  
11 10 percent, 20 percent, take a number, I don't care,  
12 then you need to look at the method.

13                   So I think there's merit in what you're  
14 saying, Mike, but I don't know how much into the weeds  
15 you want to get here.

16                   MEMBER STETKAR: CJ, since we're  
17 discussing the rule today, the proposed change to the  
18 rule, which is precisely what's on the board right  
19 now --

20                   (Simultaneous speaking.)

21                   MR. FONG: This is a deletion. There's an  
22 addition on the next slide.

23                   MEMBER STETKAR: Okay.

24                   MR. FONG: So that's the language that was  
25 deleted that basically says any change you've got to

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1 come to NRC.

2 MEMBER STETKAR: Right.

3 MR. FONG: The next slide shows the  
4 language that we use to kind of replace that, where we  
5 said you're going to have a license -- instead of that  
6 you're going to have a license condition that will  
7 identify which changes require NRC approval.

8 PARTICIPANT: The license condition on  
9 file, this 10 percent or 20 percent?

10 MR. FONG: I'd have to ask Geary on that  
11 one, too. I guess the license condition could specify  
12 a process maybe to identify these. But I like what  
13 Dr. Banerjee said about sort of upstream. If you  
14 think of this analysis, there's a number of upstream  
15 calculations and there's sort of a series of  
16 downstream calculations. We picked the point in the  
17 analysis that we felt that we could make a reasonable  
18 judgment as far as where the sensitivities lie.

19 MEMBER BANERJEE: There's nothing that  
20 stops you from doing that here, the language, as far  
21 as I can see. It's really up to the staff.

22 MR. FONG: Geary, any thoughts on that?

23 MR. MIZUNO: Simply to say that the  
24 ultimate language change that is reflected in the  
25 draft final rule reflects the difficulty of trying to

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1       come up with a one-size-fits-all criterion that can be  
2       readily conveyed in rule language that would not cause  
3       perhaps over-regulation for some applications and  
4       under-regulations for others.

5               And ultimately the compromise or the final  
6       position that was adopted was that we, meaning the  
7       NRC, would review each application, determine the key  
8       aspects of the methodology -- I mean, methodology in  
9       quotations marks -- or the approach that would seem to  
10      be of most concern to the NRC should it change,  
11      recognizing that every approach may be different and  
12      that we would then control that through a clear  
13      license condition.

14              And of course these license conditions are  
15      developed as part of the application review process,  
16      so that if the applicant felt that the staff's initial  
17      draft license condition was not acceptable, that that  
18      would be the subject of the back and forth.

19              But in general, what you see in the  
20      regulatory language is what the NRC staff is trying to  
21      control in terms of the ultimate goal or -- I don't  
22      want to call it performance, but ultimate goal.

23              MR. CLIFFORD: If I could give an example,  
24      in the deterministic world, when we approve a fuel rod  
25      thermal-mechanical model, of course the model is

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1       comprised of many, many different models within that  
2       named routine, we may approve the fission gas release  
3       model, for example, and say we've accepted this based  
4       upon the data and we've accepted the upper tolerance  
5       and the lower tolerance and how those are applied in  
6       the design-basis calculations.

7                But we may also say that say something as  
8       purely empirical, like rod growth -- we may say, well  
9       -- the vender may say, well, we're still collecting  
10      rod growth data in the spent fuel pool after so many  
11      outages and our database is expanding and expanding  
12      and expanding and we don't want to be locked into one  
13      particular model, so we'll approve a process that says  
14      you must use a best estimate of all the data for this  
15      application. You must use a 95 upper tolerance for  
16      this design calculation. You must use a lower 95 for  
17      this application.

18               So that allows the vendor -- so the  
19      process allows the vendor to collect data, use that  
20      data and then adapt their model without coming back  
21      for NRC approval. I'm not saying that's directly  
22      applicable to risk-informed, but that's something that  
23      we've done in the past.

24               MEMBER BANERJEE: So NRC doesn't look at  
25      the final model and make sure that the --

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1 MR. CLIFFORD: Not the updates to the  
2 model. It would be a notification process. They  
3 would send us a letter and say we've collected this  
4 data. Here's the new data, the old data. Here's how  
5 we're using it. We're sticking -- we define that they  
6 have to use a 95/95 upper tolerance of the data. But  
7 we don't necessarily review, approve and issue a new  
8 SE for the amendment to the model.

9 MEMBER BANERJEE: So you sort of accept it  
10 without doing a confirmatory review or analysis?

11 MR. CLIFFORD: Correct.

12 VICE CHAIR CORRADINI: So can you  
13 interrupt the blue for me? It looks maybe thankfully  
14 or unthankfully a bit legalistic. You're saying that  
15 NRC approval must specify the type of changes to the  
16 risk-informed analyses, evaluations and modeling for  
17 which NRC -- must be requested in the form of a  
18 license amendment.

19 MR. FONG: Right. So in plain English,  
20 some changes would require a license amendment, some  
21 would not.

22 VICE CHAIR CORRADINI: So if I read this  
23 right, somewhere in the Reg Guide, which we're not  
24 going to look at and we're not going to talk about --

25 (Laughter.)

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1 VICE CHAIR CORRADINI: -- there's going to  
2 be guidance that has physical parameters which are  
3 trigger points? I'm still back to the physical  
4 parameters. If I were to have kept --

5 MEMBER BANERJEE: Anything that --

6 VICE CHAIR CORRADINI: Yes, but that's  
7 what bothers me. It just strikes me as this is a --

8 MEMBER BANERJEE: Well, the staff will  
9 tell you what those are.

10 VICE CHAIR CORRADINI: When we get to 229,  
11 you'll come back to that?

12 MEMBER BANERJEE: Yes. I won't come back.  
13 You'll do it.

14 MR. FONG: Well, in the Reg Guide that  
15 we're not going to talk about today there will be  
16 additional guidance there. But I would say that after  
17 looking at a number of these they're very, very site-  
18 specific. And so, I think a good example would be  
19 non-qualified coatings. We've seen some sites that  
20 have a lot of non-qualified coatings. So their model  
21 for how those coatings are dislodged during a LOCA and  
22 they transport and what fraction get where, it's very  
23 important and can really affect the final answer. But  
24 there other sites that don't have much non-qualified  
25 coatings at all. But that model's less important.

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1           So I'm confident that the staff, after  
2           looking at these in a lot of detail -- we can make  
3           that call.

4           MEMBER BANERJEE: I guess what he's saying  
5           though --

6           VICE CHAIR CORRADINI: I guess what I'm  
7           saying though, if I might try, is there's some  
8           temperature that I'm concerned if I get above, I don't  
9           have adequate long-term cooling and they come with a  
10          risk-informed calculation that says here is the bound,  
11          here's our calculation, here's our 5 to 95 window, and  
12          you're okay with that method, and then they come in by  
13          some change in how they're running their plant, that  
14          that changes. And the delta change in that is large  
15          enough by some measure. Now I start looking.

16          It seems the trigger ought to be based on  
17          long-term cooling, and I just jump to temperature,  
18          versus the individual pieces of the calculation.  
19          That's just what is bothering me.

20          MR. FONG: I see what you're saying. I  
21          think a lot of times you're not going to get that  
22          fidelity. For example, all of the applications we've  
23          seen so far will try to bound certain cases. So  
24          they'll say for this debris load in the vessel the  
25          temperature peaks at X. Okay? Then they'll evaluate

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1 other break locations. They won't necessarily run all  
2 their thermal-hydraulic models again to get X sub 1,  
3 X sub 2, X sub -- they're not going to get 1,000  
4 different temperatures. They're going to run and see  
5 if the debris was less than what created X. And you  
6 call it bounded.

7 So you might not get that full range of  
8 temperatures for each accident sequence that you're  
9 thinking of where you could do a comparison.

10 VICE CHAIR CORRADINI: Right.

11 MR. FONG: There's a bounding and kind of  
12 binning approach that's used because of the thousands  
13 and thousands of scenarios. One application had over  
14 one million scenarios they presented to us. So  
15 they're not going to have a peak clad temperature for  
16 every single one of those. They'll try to group them  
17 and bound them.

18 VICE CHAIR CORRADINI: Sure.

19 MR. FONG: So I don't know that you'd get  
20 that level of fidelity where you could define a clear  
21 one-dimensional metric. Okay, stay below at this  
22 temperature and you're fine. It's not always that  
23 simple.

24 VICE CHAIR CORRADINI: But my simple mind  
25 says that if they get -- their peak X is here and the

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1 long-term cooling worry limit is here, then I have a  
2 margin. And if I start eating that margin away by  
3 some percentage, now I start looking at their method.  
4 And if I don't, then life is good.

5 MEMBER BANERJEE: I think the problem  
6 you're dealing with, Mike, is there aren't any good  
7 models, right, which is part of the problem. So a lot  
8 of it depends on sort of prototypical testing and  
9 things like that. So you can't say that adding a  
10 little chemical will give you a sort of linear  
11 response in your result.

12 VICE CHAIR CORRADINI: I understand.

13 MEMBER BANERJEE: You might block the  
14 whole thing. So I think that's part of the problem  
15 that the staff is faced with. They have to depend on  
16 sort of judgment and looking at things. It's not an  
17 easy problem because there isn't a good model. That's  
18 the problem.

19 MEMBER BALLINGER: I think we're sort  
20 of --

21 MEMBER STETKAR: A bit of my concern is  
22 this is rule language. It's not regulatory guidance.  
23 It's rule language. And this, the way I read it, says  
24 the NRC approval. When you give your approval of this  
25 risk-informed application with its supporting analyses

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1 and methods, at that point you, the staff, are locked  
2 in. It says "must specify." So methods A-1, A.2, B.7  
3 fall under this license condition. A-1.4 doesn't.

4 Now, if I change A-1.4 later and I'm an  
5 applicant and it makes a big -- well, I don't have to  
6 -- it's not part of my license condition. You can't  
7 do that. You specified a priori the only ones. And  
8 that hamstrings a lot of people.

9 MR. FONG: Yes, that's the trade-off.

10 MEMBER STETKAR: Because you don't --

11 MR. FONG: I mean, we anticipate a lot --

12 (Simultaneous speaking.)

13 MEMBER STETKAR: -- we have a lot of  
14 examples in risk assessment over two or three decades  
15 where certain methods -- methods and knowledge evolve  
16 over time.

17 MR. FONG: Sure.

18 MEMBER STETKAR: And what you might think  
19 is important today might not be so important from a  
20 methodology perspective --

21 MR. FONG: No, I think --

22 MEMBER STETKAR: -- 10 years from now.

23 MR. FONG: I appreciate that point, and I  
24 think what the staff's done to try to address that is  
25 there's an update process. You're not --

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1 (Simultaneous speaking.)

2 MEMBER STETKAR: Well, that's what I was  
3 getting to is there is an update requirement.

4 MR. FONG: There's an update process  
5 that's both --

6 (Simultaneous speaking.)

7 MEMBER STETKAR: And any updates are  
8 auditable by --

9 MR. FONG: Right. So in that situation  
10 you're describing our --

11 (Simultaneous speaking.)

12 MEMBER STETKAR: That gets you a way out  
13 without hamstringing the staff into specifying a  
14 priori --

15 (Simultaneous speaking.)

16 MEMBER STETKAR: -- what is allowed or  
17 isn't allowed in a license condition.

18 MR. FONG: There's a requirement that as  
19 issues are identified real time they're addressed, but  
20 also every four years there's an update.

21 MEMBER STETKAR: Every four years it  
22 updates the PRA.

23 MR. FONG: So the change you're talking  
24 about would be caught by that update process.

25 MEMBER STETKAR: Yes.

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1                   MEMBER BALLINGER: My job performance  
2 depends on me staying on schedule, in which case I've  
3 blown it already. We need to have time for the  
4 industry presentation. So unless there are any other  
5 questions, can we -- thank you very much for being  
6 excoriated.

7                   MR. FONG: Thank you.

8                   MEMBER BANERJEE: But I think the message  
9 you take away is that if it's somehow possible to  
10 relate it to an outcome rather than being too  
11 prescriptive; it could be something upstream, which is  
12 say the fiber loading per channel or something, that  
13 would be helpful.

14                   MEMBER BALLINGER: Thank you.

15                   MR. FONG: Thank you.

16                   MR. CLEFTON: Good morning. Thank you  
17 very much for allowing me to represent the industry  
18 this morning. To stay on schedule, as Ron identified,  
19 I have one significant point that I'd like to bring to  
20 the table today, and that is I'd suggest that we  
21 consider conditional compliance with this rule.

22                   The rule started with our implementation  
23 in 2000. By 2002 the staff and the industry were  
24 working together for a solution to the petition. Our  
25 petition was simply take the now names out of the

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1 existing rule. Since that time we've been working for  
2 16 years to refine the language in there with ANPRs,  
3 draft pre-decisional, more draft, more draft, more  
4 workshops, more meetings and several times with the  
5 ACRS.

6 And I'd have to compliment the staff and  
7 the management at the NRC that they've used the  
8 subject matter resources that were available in the  
9 industry to optimize the language. I think we're  
10 getting to a point that it's reasonable. We can use  
11 that word in this standpoint.

12 We worked with the staff to identify an  
13 implementation schedule. We worked with the staff to  
14 make it a performance-based rule. We worked with the  
15 staff to listen to the vendors and their complications  
16 associated with providing quality material. As Member  
17 Brown identified, we've had 50 years of good  
18 performance without breakaway oxidation.

19 The E-110 that existed has not been in use  
20 in the United States, any place else in the world.  
21 That isn't an issue. We resolved it in the rule. You  
22 made it a method to keep it in the Quality Assurance  
23 Program.

24 So my slides today are to please recognize  
25 that compliance with this rule is a significant

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1 consumption of resources on both sides, the NRC and  
2 the industry. We have several programs going in the  
3 nuclear world right now. We have cumulative effects  
4 of regulation, whether the changes in regulation are  
5 important and significant and give us safety gain.  
6 We've got Project AIM 2020, which the NRC is working  
7 at improving the efficiency within the halls of the  
8 NRC.

9 In the industry we've got Delivering the  
10 Nuclear Promise. We've got significant improvements  
11 and gains, and that predominantly based on safety,  
12 efficient and cost of operation. All of those drive  
13 us to a point that we're threatening power plants out  
14 there. We've lost a few out recently. Economic  
15 reasons driving them down because the price of gas and  
16 other competition that's out there.

17 By making this a conditional rule we can  
18 allow those plants that are right on the margin of  
19 operations to implement it, go in compliance with it,  
20 provide the documentation, all the necessary  
21 calculations, if there's an economic or a safety  
22 benefit for it. But if there's not, let's let them  
23 continue operating safely as they are today and have  
24 been for the past 16 years on 10 CFR 46 so that we  
25 don't force a regulation on the marginal plant

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1 operators that are looking at the resources that could  
2 drive them to closing.

3 VICE CHAIR CORRADINI: So can I clarify  
4 what you just said? You're saying that if I don't  
5 change the fuel, or cladding, and I don't have some  
6 sort of burnup limit, you would not be subject to  
7 this?

8 MR. CLEFTON: Right. We're putting it in  
9 that we're worried predominantly of future fuel loads  
10 and allowing new fuel designs with a fresh rule, but  
11 existing rule 46 takes good care of us. We are  
12 operating quite safely on it. If we have thermal  
13 conductivity degradation or an error that's discovered  
14 in the PCT, or some other thing that requires a new  
15 evaluation model, that's where we would initiate and  
16 roll to 46c. And it would be rolled into the cost.

17 Typically we're not going to do a power  
18 uprate unless there's a power gain associated with it.  
19 If we're going a power up again, we have new  
20 evaluation, new models. Or if we're making an  
21 economic decision to move to new fuel loads from a  
22 different manufacturer or change description, a new  
23 evaluation model would be driven.

24 And those could be defined with interface  
25 between the staff and the industry certainly. But

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1 it's big picture. If a new evaluation model is out  
2 there, then we should roll to 46c. If not, continued  
3 life under 46 as it is now.

4 MEMBER BROWN: Just to make sure I  
5 understand, right now it's not conditional. It's an  
6 eight-year -- everybody's got to comply in eight  
7 years?

8 MR. CLEFTON: Exactly.

9 MEMBER BROWN: And you've got to make  
10 plans be available, or at least identify a game plan  
11 within six months or something like that? You would  
12 want that eight years to go to some flexibility  
13 between staying with where you are based on some  
14 conditions as opposed to moving to adherence to the  
15 rule?

16 MR. CLEFTON: Right. And as I took the  
17 Subcommittee meeting, there is a single line that we  
18 can take out of the rule that allows continued  
19 operation under 46. We can take out the other one  
20 that says "must be complied with by" the interval.  
21 The 84 months came from industry and staff working  
22 with a survey that I ran for the whole industry and  
23 the vendors to project how long it would take to put  
24 compliance in place for all power plants. And then we  
25 backed off.

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1           And the reasonable approach that we came  
2 up with was that within 60 months we'd have a plan for  
3 implementation, and within 84 months we'd have it all  
4 in place. But we could take out that 84-month date  
5 and still have periodic safety reviews. We've had  
6 both owners' groups come back with safety analysis  
7 that shows continued operation with periodic reviews  
8 by the NRC as continued safe operation of the existing  
9 plants out there.

10           So it takes away the fixed date. We can't  
11 see any real reason for that fixed date out there.  
12 There's no driver specific for it. There's no  
13 increase in safety margin or anything associated with  
14 it.

15           MEMBER BROWN: So they'd will still be  
16 with what? Is it the 17 percent thing and the --

17           (Simultaneous speaking.)

18           MR. FONG: Well, existing fuel would  
19 continue under its operation. The 17 percent straight  
20 line that we'd go into a curved support of extended  
21 operation hydrogen uptake is based on extend life of  
22 the fuel and pushing it beyond where we are right now.  
23 Operational aspects, we're not pushing fuel that hard  
24 right not and we wouldn't have plans to.

25           But I think what our concern was that in

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1 future designs you might be different place on that  
2 curve, that we go further out. We don't want to --  
3 and Paul perhaps can explain that better for us as far  
4 as implementing new fuel designs that he might have  
5 been looking at.

6 Yes, sir?

7 MEMBER RICCARDELLA: I guess I'd like to  
8 know what the staff's reaction is to this suggestion.

9 MR. CLIFFORD: This is Paul Clifford from  
10 the staff. One problem with this -- defining a  
11 trigger, and one of the triggers would be a plant mod,  
12 would be it would discourage plants from moving from  
13 old ZIRLO to optimized ZIRLO, because even though  
14 optimized ZIRLO is much better, it doesn't corrode as  
15 much and it would be beneficial with respect to 50.46  
16 performance, it would then force them to redo all the  
17 analysis and incur that expense. So it would be  
18 detrimental to improvements to the plant. That's one  
19 thought.

20 MEMBER RICCARDELLA: So therefore you'll  
21 force everybody to incur that additional expense?

22 MR. CLIFFORD: Well, I mean, we've worked  
23 with the industry and we've come up with a very  
24 flexible seven-year -- I mean, that's three, four,  
25 five outages depending on your cycle length, to adapt

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1 or adopt the new requirements.

2 I mean, another way of doing this would be  
3 if there's a certain number of plants that are  
4 approaching their end of life, maybe you would like to  
5 extend the 7 years to 12 years, or something else.  
6 That would give you even more flexibility. But to  
7 throw away the overall requirement that eventually  
8 you'll have an end date, I mean, that's something that  
9 the staff doesn't support. I think there has to be an  
10 end date where you eventually comply with the new  
11 requirements.

12 MEMBER BALLINGER: But the counter-  
13 argument for that would be, at least in one sense,  
14 you're saying that improvement for improvement's sake  
15 is an absolute good regardless of what the current  
16 level of safety is.

17 MR. CLIFFORD: What I was trying to say is  
18 if --

19 MEMBER BALLINGER: Is that what you're  
20 saying?

21 MR. CLIFFORD: Well, no, they wouldn't  
22 move to a better performing alloy because they would  
23 have to incur the cost of going to 50.46c, whereas if  
24 they stayed with their old poor-performing alloy, they  
25 wouldn't incur that cost.

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1                   MEMBER BALLINGER: But if their peak clad  
2 temperature was 1,700 Fahrenheit, or some ridiculously  
3 low number, all right, you're saying that they should  
4 change anyway, where industry would argue we're at  
5 1,700 with the current fuel that we have. Why should  
6 we change?

7                   MR. CLIFFORD: There are a lot of plants  
8 out there, more than 40 percent of the plants out  
9 there that aren't limited by LOCA.

10                  MEMBER BALLINGER: Right.

11                  MR. CLIFFORD: And the change, the amount  
12 of money incurred to move to 50.46c is not  
13 significant, because they don't have to update their  
14 models. They don't have to re-perform their  
15 calculations. They just say here are my existing  
16 analysis records results and I can meet the stricter  
17 50.46c requirements. I don't have to do anything. I  
18 just have to demonstrate that I'm in compliance and  
19 I'm done.

20                  But there are plants out there that are  
21 closer, that have to do more work. So there are  
22 plants out there. And we know exactly which plants  
23 are which and how many fall into each category.

24                  MEMBER BALLINGER: Thank you. That it?

25                  MR. CLEFTON: Yes, sir. Trying to keep it

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1 on schedule.

2 MEMBER BALLINGER: Well --

3 MR. CLEFTON: We're between us and the end  
4 of the break at 9:45.

5 MEMBER BALLINGER: We're opening the  
6 bridge line as we speak, but in the meantime we should  
7 take comments from the audience. If anybody has  
8 comments from the audience, can you please step to the  
9 microphone, state your name and give us your comment?

10 (No audible response.)

11 MEMBER BALLINGER: We have a full gallery  
12 and nobody has single comment.

13 MR. CLEFTON: This is a reflection of how  
14 closely the staff and the industry --

15 (Laughter.)

16 MR. CLEFTON: -- have been working on  
17 putting this rule together.

18 MEMBER BALLINGER: Or the number of  
19 retirements that have occurred since 2002.

20 Okay. The bridge line is now open, I  
21 think. Is there anybody out there?

22 MR. LAUR: Yes, this is Steve Laur.

23 MEMBER BALLINGER: Steve, can you give us  
24 your comment, please?

25 MR. LAUR: Well, my first comment was you

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1 asked if anybody was out here, and the answer is yes.

2 (Laughter.)

3 MEMBER BALLINGER: Okay. So if you don't  
4 want to make a comment, just let us know.

5 MR. LAUR: No, I'd like to make a very  
6 quick comment, if I may. I'm a member of the -- Steve  
7 Laur, a member of the NRC staff, not the public.

8 But this talk about methods I find a  
9 little disconcerting. The deterministic people are --  
10 I guess they're a little confused because they do  
11 understand and control methods. We're talking about  
12 the process that's used to calculate the end point.  
13 So if a plant had an Appendix K or a RELAP analysis  
14 and on their own decided to use a MAP analysis, the  
15 staff would want to review that change. That's the  
16 kind of thing we're talking about, not the final  
17 answer, not the final metric such as core damage  
18 frequency, but how you got there.

19 Because a plant could find a whole bunch  
20 more debris and change to a different approach and get  
21 the same number. And the staff would like to review  
22 that approach. The bottom line is we expect the  
23 methods to be acceptable to the NRC. Thank you.

24 MEMBER BALLINGER: Thank you. Are there  
25 any more comments on the bridge line?

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1 MR. LEWIS: My name is Marvin Lewis. I'm  
2 a member of the public.

3 MEMBER BALLINGER: Yes, Marvin?

4 MR. LEWIS: Thank you for this  
5 opportunity. I want to point out that a lot of this  
6 work on 46c originated with an engineer -- well,  
7 actually a father-son team called Leeseey. And don't  
8 ask me to spell that.

9 But anyway, what I'm worried about is  
10 that, yes, without input from the public, not meaning  
11 the utilities and not meaning the staff, there are  
12 situations missed, like a hanging maintenance tag in  
13 front of a little red light at Three Mile Island back  
14 in '79, like the Leeseey's objection -- and we know the  
15 Polly Cathcart occurred, that there was something  
16 going on at 2,220 degrees. And these inputs seem to  
17 have a problem getting through, although I have to  
18 admit that with Leeseey's numbers and with Three Mile  
19 Island No. 2, where it did get through. And I wound  
20 up actually winning a contention on Three Mile Island  
21 No. 1 restart back in '80.

22 But I am worried about these fuel  
23 questions, because they were very, very difficult to  
24 get through, very, very difficult to get into the  
25 public sphere. And I hope that we'll see more people

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1 getting into these conversations from the public. I  
2 think the public are in charge of the life boats even  
3 if the NRC and the utilities are in charge of the  
4 power plants.

5 And thank you for allowing me to make my  
6 statement.

7 MEMBER BALLINGER: Thank you. Are there  
8 any more folks that want to make a comment?

9 (No audible response.)

10 MEMBER BALLINGER: Hearing none; thank you  
11 very much, I turn the it over to the Chairman.

12 CHAIRMAN BLEY: Thank you, Dr. Ballinger.  
13 We're a little bit behind, but we'll start the next  
14 session at 10:00, 15 minutes late.

15 Before we take a break, I want to remind  
16 all the members that the reason there's an extended  
17 lunch is we have a closed meeting to talk about some  
18 specific personnel issues. We will -- let me glance  
19 at the calendar here. We'll allow ourselves a short  
20 break and we'll start that meeting at 12:30. So we  
21 all need to be back here for a closed meeting at  
22 12:30.

23 We'll take a break until 10:00.

24 (Whereupon, the above-entitled matter went  
25 off the record at 9:43 a.m. and resumed at 10:03 a.m.)

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1 CHAIRMAN BLEY: Meeting will come to order  
2 once again and we'll move onto to Peach Bottom  
3 MELLLA+, and I'll pass it to Dr. Rempe.

4 MEMBER REMPE: Thank you, Mr. Chairman.

5 On December 2nd our Power Updates  
6 Subcommittee reviewed the license amendment request  
7 and the associated NRC staff safety evaluation to  
8 allow operation of Peach Bottom Units 2 and 3 in the  
9 expanded Maximum Extended Load Line Limit Analysis, or  
10 MELLLA+ domain. And at the end of this meeting our  
11 Subcommittee recommended that this LAR be presented to  
12 the Full Committee.

13 This LAR for operation in the MELLLA+  
14 domain is the fourth to be reviewed by us, and as  
15 you'll hear today many of the features of Peach Bottom  
16 Units 2 and 3 that are of importance with respect to  
17 MELLLA+ operation are encompassed by or similar to  
18 features that we've seen in plants that we've  
19 previously reviewed.

20 Today we're going to hear presentations  
21 from the NRC staff, their consultant and  
22 representatives from the licensee, Exelon Generation  
23 Company. And part of the presentations will be closed  
24 in order to discuss information that's proprietary to  
25 the licensee and its contractors.

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1           And I believe we're going to be starting  
2 today by hearing from Doug Broaddus from NRR  
3 management.

4           Doug?

5           MR. BROADDUS: Thank you. Good morning.  
6 Yes, I'm Doug Broaddus. I'm am the chief of the Plant  
7 Licensing Branch I, II in the Division of Operating  
8 Reactor Licensing in the Office of Nuclear Reactor  
9 Regulation.

10           The NRC staff appreciates the opportunity  
11 to brief the ACRS Full Committee meeting on Exelon  
12 Corporation's license amendment request to allow Peach  
13 Bottom Units 2 and 3 to operate in the Maximum  
14 Extended Load Line Limit Analysis Plus domain, or as  
15 we're going to refer it from now on, MELLLA+.

16           The request would change the Peach Bottom  
17 technical specifications from the currently licensed  
18 MELLLA domain to allow operation in an expanded  
19 MELLLA+ domain under the previously-approved extended  
20 power uprate conditions of 3951 megawatts thermal  
21 radiant core power.

22           The expanded MELLLA+ operating domain is  
23 intended to increase operating flexibility by allowing  
24 control of reactivity at maximum power by changing  
25 flow rather than by control of rod insertion or

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1 withdrawal. The proposed amendment would allow  
2 recirculation core flow to operate within a wider  
3 window than under the current MELLLA conditions to a  
4 core flow as low as 83 percent under MELLLA+.

5 Peach Bottom Units 2 and 3 are boiling  
6 water reactors owned and operated by Exelon, and at  
7 this meeting the NRC staff will present the results of  
8 our review of Exelon's application.

9 The technical staff performed a thorough  
10 review of Exelon's application, which is the NRC's --  
11 as was said before, it was the NRC's fourth review  
12 involving the implementation of MELLLA+. Staff did  
13 previously review and has presented on Monticello,  
14 Grand Gulf and Nine Mile Point Units 2.

15 As with the previous reviews, Exelon  
16 followed the NRC-approved GE-Hitachi MELLLA+ topical  
17 report to find the scope of the evaluations required  
18 to support operation of Peach Bottom in the MELLLA+  
19 domain.

20 The NRC's review of Peach Bottom as  
21 documented in the draft safety evaluation previously  
22 provided to ACRS contains no open items, and it has  
23 been revised to address feedback received during the  
24 ACRS Subcommittee meeting.

25 MEMBER REMPE: Doug, with respect to the

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1 version that we got since the Subcommittee meeting, I  
2 was glad to see that you did update it for Section  
3 3.39, like we discussed or identified, but there were  
4 a lot of changes. And so for the record today could  
5 you characterize some of those changes? And is it in  
6 your belief correct in every way at this time, or are  
7 there some other changes still to be incorporated?

8 MR. BROADDUS: I would characterize that  
9 the majority of the changes were clarifications rather  
10 than technical changes. We really didn't make any  
11 technical -- Rick, I'll let you, if you want to convey  
12 any more than that.

13 MR. ENNIS: This is Rick Ennis. I'm the  
14 project manager for Peach Bottom at NRR. The changes  
15 that we made were editorial to clarify like  
16 conclusions, the reasons why those conclusions were  
17 made. We had also sent a version of the draft SE to  
18 Exelon to do a proprietary markings review, and we  
19 corrected some of those. And then also to incorporate  
20 your comments and just little editorial changes  
21 throughout, but no real content changes other than  
22 this one section 3.39 that ACRS had commented o.

23 MEMBER REMPE: Okay. Thank you.

24 MR. BROADDUS: All right. Based on the  
25 staff's thorough review the staff has determined that

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1 the proposed operation of Peach Bottom Units 2 and 3  
2 in the MELLLA+ domain provides additional operational  
3 flexibility, satisfies all applicable regulatory  
4 criteria and maintains plant safety.

5 This concludes my opening remarks. Unless  
6 there are any additional questions, I would like to  
7 turn it over to Rick Ennis, the NRC senior project  
8 manager for Peach Bottom Units 2 and 3. And he will  
9 provide some additional details about the MELLLA+  
10 application and the presentations you'll hear today.

11 MR. ENNIS: As I mentioned, my name is  
12 Rick Ennis. I'm the NRC project manager for Peach  
13 Bottom in the Office of Nuclear Reactor Regulation,  
14 Division of Operating Reactor Licensing.

15 Today you'll hear presentations from the  
16 NRC staff and Exelon regarding the proposed MELLLA+  
17 for Peach Bottom Units 2 and 3.

18 I'll provide some background information  
19 regarding the staff review and then I'll discuss the  
20 agenda for today's meeting.

21 After we received the application in  
22 September 2014, as we do with other license amendment  
23 reviews, the staff performed an acceptance review.  
24 And we accepted the application for review on October  
25 14th, 2014 based on the finding that the application

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1 provided sufficient detail for the technical review.  
2 The key technical areas during the review involved the  
3 Reactor Systems Branch in NRR, as well as the Human  
4 Factors Branch.

5 The overall review we found was pretty  
6 straightforward. We had a total of 40 RAI questions.  
7 These questions resulted in eight supplements to the  
8 application being submitted by Exelon.

9 Consistent with our focus area of the  
10 review we performed two audits. The first audit in  
11 May of 2015 at the Peach Bottom site focused on time-  
12 critical operator actions and detail of issues related  
13 to this audit are contained in Section 3.3.10 of the  
14 staff's safety evaluation.

15 The second audit from August 31st to  
16 September 2nd, 2015 was at GE-Hitachi in Wilmington,  
17 North Carolina, and that audit focused on sensitivity  
18 calcs and the methodologies for ATWS within  
19 instability events using TRACG. Details of the issues  
20 related to that audit are contained in Appendix A to  
21 the staff's safety evaluation under Requests for  
22 Additional Information SRXB-RAI-18. And the NRC staff  
23 presentations today closely align with these technical  
24 focus areas addressed by the audits as well as the  
25 RAIs.

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1           With respect to the agenda today, during  
2           the open session Exelon will provide an overview and  
3           history of some of the key design issues pertaining to  
4           Peach Bottom and an overview of the amendment request.  
5           They'll also provide a discussion on the design and  
6           analyses supporting the proposed change, as well as a  
7           discussion on operator procedures and operator  
8           training including time-critical operator actions.

9           We'll then need to go into closed session  
10          due to the proprietary nature of the information that  
11          will be discussed. The first presentation during the  
12          closed session will be a discussion by Exelon  
13          regarding the MELLLA+ analyses and then the NRC staff  
14          and one of our contractors will give a presentation  
15          that will focus on the reactor systems and human  
16          factors reviews.

17          Unless there's any questions, I'd like to  
18          turn it over to Exelon.

19          MEMBER REMPE:    So I have a question.  
20          During our Subcommittee meeting in the open section  
21          Dr. Powers asked you to identify some lessons learned  
22          from these reviews, and although he complimented you  
23          guys for your great and thorough job, he did say have  
24          you come up with some ideas where you think that you  
25          might be able to expedite future reviews or by -- with

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1 maintaining the same level of safety, of course.

2 And as I recall, the response back from  
3 you and your colleagues were that you were thinking  
4 about developing some sort of a guidance document.  
5 There was some testing, which I did see you'll be  
6 presenting in the closed session that user need  
7 request that you're planning to do, and then some  
8 additional plant -- other plant-specific models with  
9 trace and analyses so that you'd be able to expedite  
10 the review process with plant comparison calculations.  
11 Is that still true? Because I think he did ask you to  
12 discuss that during the Full Committee meeting.

13 MR. BROADDUS: Yes, and also one of the  
14 things I remember talking about during the  
15 Subcommittee meeting -- this review really didn't take  
16 much -- other than the fact that we had to go through  
17 ACRS, if we hadn't done that, it would have been  
18 completed very close to our normal one-year metric for  
19 a normal licensing action.

20 MEMBER REMPE: Yes.

21 MR. BROADDUS: So, and that's how we look  
22 at efficiency. Can we complete things within one  
23 year? Some of the reasons why it was a little bit  
24 close to the one year was there were other MELLLA+  
25 reviews being done at the front end which was

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1 impacting some of the exact same staff we were trying  
2 to use, so that delayed some of the safety evaluation  
3 inputs to us.

4 So one thing NRR staff has to do going  
5 forward is before we would go to any great lengths to  
6 develop guidance for efficiencies, we have to  
7 determine how many more MELLLA+ reviews are we going  
8 to get in the future? Is there a bang for the buck to  
9 go to great lengths to -- like for EPU's we have the  
10 review standard. We probably don't want to go to that  
11 extent. That was a huge effort. Okay?

12 Then again, we talked about the format on  
13 the safety evaluation. What we did in this case is we  
14 followed what we did for Grand Gulf. Going through  
15 this I think there are some things that we could do to  
16 make that a little bit easier to do and make it very  
17 clear which branches have which sections of the SE to  
18 do. I know the user need that Diego talked about,  
19 that will help down the future, but I'm not sure what  
20 the timing will be with respect to other licensing  
21 actions.

22 We do have a regulatory issue summary that  
23 NRR has issued were licensees to submit expected  
24 licensing actions. We do that across the board for  
25 any licensing actions. I think we're expecting --

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1 Doug, you can correct me, I think the end of February  
2 is the next submittal?

3 MR. BROADDUS: Yes.

4 MR. ENNIS: Yes, so we'll get an idea  
5 possibly of other MELLLA+s and when they're going to  
6 come in. So I don't think there's anything definitive  
7 at this point.

8 MEMBER REMPE: So the guidance document's  
9 off the table, to summarize. The user need for  
10 getting data is still on the table?

11 MR. ENNIS: Still on.

12 MEMBER REMPE: Additional trace  
13 calculations are on or off right now?

14 MR. ENNIS: Diego, could you address that?

15 MR. SAENZ: This is Diego Saenz.

16 MEMBER REMPE: Yes.

17 MR. SAENZ: Our management is still  
18 reviewing whether or not that --

19 MEMBER REMPE: So it's a request that  
20 you'd like? And then just because you mentioned it,  
21 how many more MELLLA+ plants are you anticipating at  
22 this time? I know there's one under review. Is  
23 there another?

24 MR. ENNIS: I don't --

25 MEMBER REMPE: Or is there one that is --

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1 I know another of a plant.

2 MR. ENNIS: Is there one under review  
3 right now, Diego?

4 MR. SAENZ: Well, there's the EFW, so,  
5 yes, there's the EFW for Monticello under review right  
6 now.

7 MEMBER REMPE: Isn't there another plant  
8 that's not come yet that will be doing an EPU, and the  
9 MELLLA+ most likely that I know of? I don't know if  
10 we're supposed to say names or not.

11 MR. ENNIS: I'm not aware.

12 MEMBER REMPE: I've heard discussion  
13 about --

14 MR. SAENZ: I can say I'm expecting a  
15 MELLLA+ submittal this summer for another plant.

16 MEMBER REMPE: Yes, that's what I -- yes,  
17 okay.

18 MR. SAENZ: So that might be the same one  
19 you're talking about.

20 MR. BROADDUS: Just one clarification. I  
21 would say that a formal guidance may be off the table,  
22 but informal we still have the ability, as Rick said,  
23 to provide some informal guidance. We could say, hey,  
24 this is how we're going to approach these in the  
25 future if we get another one or something like that,

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1 from lessons learned. But if there's -- we wouldn't  
2 likely be doing something that's formal as the review  
3 standard for the EPU's and such.

4 MEMBER REMPE: Okay. Thank you.

5 MR. BROADDUS: You're welcome.

6 MEMBER REMPE: Any other questions from  
7 the staff?

8 (No audible response.)

9 MEMBER REMPE: Then I guess let's switch  
10 and have the licensee come up with their open  
11 presentation.

12 MR. NEFF: Good morning. This is the  
13 Peach Bottom presentation for the MELLLA+ application.  
14 My name is David Neff. I am the licensing engineer  
15 for EPU. I had worked on the Peach Bottom EPU and the  
16 MELLLA+ projects. Kevin is unable to attend today, so  
17 I'm replacing Kevin on the presentation.

18 Okay. Good morning. I will introduce the  
19 presentation team.

20 MEMBER REMPE: You have papers, or  
21 somebody does. I think it's you.

22 MR. NEFF: That was me. Thank you.

23 MEMBER REMPE: Be careful because it  
24 interferes with the --

25 (Simultaneous speaking.)

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1 MR. NEFF: It sure does. It sure does.  
2 Thank you.

3 MEMBER REMPE: -- recorder.

4 MR. NEFF: I wondered what that was.  
5 Thank you.

6 All right. Here at the table with me  
7 today is Jim Armstrong, our regulatory assurance  
8 manager. We have Andy Olson from Corporate Fuels and  
9 Dave Turek from the Peach Bottom Operations. He's our  
10 operations manager. And they will be making some  
11 presentations as well.

12 We also have some other individuals from  
13 Peach Bottom and from our corporate offices and from  
14 General Electric-Hitachi, our contractor, and will be  
15 called upon if there are some questions we need their  
16 support from.

17 Moving on to slide 5, during today's open  
18 session we will briefly provide you with a station  
19 overview leading up to our application, the MELLLA+  
20 project overview, key aspects of our design analysis,  
21 and a discussion on operator actions and training.

22 At this point I'd like to turn the  
23 presentation over to Jim Armstrong.

24 MR. ARMSTRONG: All right. Good morning.  
25 Thank you for the opportunity to present and answer

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1 any questions you may have regarding our Peach Bottom  
2 MELLLA+ application.

3 Dave will discuss during his portion of  
4 the presentation how important this change is to us,  
5 especially the flexibility and precision it provides  
6 to our operators when it comes to controlling reactor  
7 power.

8 In order to provide the foundation for the  
9 rest of our presentations and your questions, I would  
10 like to provide brief overview of our plant's history  
11 leading up to this change.

12 As previously stated, both Peach Bottom  
13 Units 2 and 3 are GE BWR-4 with a Mark I containment.  
14 The containment design pressure is 56 psig and we  
15 began commercial operation in 1974 with a original  
16 license thermal power of 3293 megawatts thermal. We  
17 just finished implementation of EPU. Unit 2 was  
18 completed in 2014 and Unit 3 in 2015 at a thermal  
19 power of 3951 megawatts thermal.

20 Part of the modifications involved with  
21 EPU involved enriched boron, which improves the  
22 standby liquid control system margin to ATWS. And  
23 then we eliminated containment accident pressure  
24 credit. We operate on a 24-month operating cycles.  
25 We have full cores of GNF2 in both units. We have

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1 steam-driven feedwater pumps and we are licensed for  
2 increased core flow of 110 percent.

3 Some history, some key milestones in our  
4 past. As I said, we began in '73-'74. We implemented  
5 the stretch power uprate in '94-'95. And then a  
6 measurement uncertainty recapture in 2002. We  
7 implemented the MELLLA operating domain in 1995. We  
8 received our renewed operating license in 2003 and we  
9 implemented the Option III Stability Solution in 2005.  
10 GNF2 fuel was introduced in 2010. We are now full  
11 core in both units. And again, EPU was just  
12 implemented.

13 Before I turn it over to Dave and the rest  
14 of the team, I want to leave you with our goal, which  
15 is to ensure that all your questions before we leave  
16 today are answered and provide you with the sense of  
17 confidence that we have regarding our readiness to  
18 implement this important change for our operators.

19 Peach Bottom continues to operate at high  
20 levels of safety and reliability. We have achieved  
21 four consecutive INPO-1 ratings, we have gone 10 years  
22 without an automatic scram, and we had a very  
23 successful implementation of EPU on both units. These  
24 achievements are reflective of the rigor that our  
25 operations, maintenance, engineering and training

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1 personnel exhibit, as well as a culture of continuous  
2 improvement through a healthy Corrective Action  
3 Program. I would also say that I am confident that  
4 this same rigor has been applied through our MELLLA+  
5 reviews and that our team will implement this safely.

6 Exelon greatly enhanced the nuclear safety  
7 of the station as part of EPU implementation. As I  
8 mentioned, two key initiatives were the enriched boron  
9 and the elimination of containment accident pressure  
10 and PSH credit by installation of RHR cross-tie mods.  
11 We are proud of these achievements. We believe we  
12 have a very safe and reliable station and we will  
13 implement MELLLA+ with those same safety goals in  
14 mind.

15 Pending any questions you may have for me,  
16 I'll turn it over to Dave Neff.

17 MR. NEFF: Thank you. This Dave Neff  
18 again. So for the MELLLA+ benefits that Jim mentioned  
19 the application will result in expanding the nominal  
20 core flow window at 100 percent EPU power by about 16  
21 percent of rated flow. This will allow us to restore  
22 the ability of the Peach Bottoms to control power  
23 using core flow versus moving control rods.

24 This should reduce the number of times we  
25 will be required to maneuver the reactor, especially

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1 during the end of cycle. We expect to eliminate about  
2 half the number of load drops, and each of those load  
3 drops then would involve a significant control rod  
4 manipulation. So by using core flow changes that will  
5 greatly simplify that kind of operation.

6 Additionally the Detect and Suppress  
7 Solution - Confirmation Density, or DSS-CD, provides  
8 earlier detection of any instability with more  
9 sensitivity and speed.

10 And finally, the station capacity factor  
11 will increase due to the reduced number of down  
12 powers.

13 On slide No. 11 is the proposed power-to-  
14 flow map. As you can see in the blue dotted  
15 horizontal line, that was our power level at 3415,  
16 which was before EPU, and that was the operating  
17 window we had while operating at 100 percent power.  
18 This horizontal line was reduced at EPU and it  
19 presented by points delta to foxtrot at the 3951  
20 megawatts thermal, which is what the EPU power level  
21 is. What MELLLA+ will allow us to do is show the  
22 green horizontal line from Juliet to foxtrot, and that  
23 will open up that flow window for the operators to  
24 then control power using flow more significantly than  
25 requiring control rod manipulations.

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1           Moving on to slide 12, as Doug had  
2 mentioned, Peach Bottom application is based on the  
3 GE-H approved topical, as were the previously approved  
4 industry applications. Operating pressure, maximum  
5 license power, maximum license core flow and feedwater  
6 flow rate or temperature are unchanged with the  
7 MELLLA+. Also balance of plant equipment is not  
8 required to be modified to support the MELLLA+  
9 implementation.

10           Slide 13 speaks to our implementation plan  
11 for two phases. Outage-related plant modifications  
12 and the installation of the DSS-CD and the firmware  
13 and testing is now complete on both units. We are  
14 monitoring both units using the DSS-CD along with the  
15 Option III Solution.

16           After NRC approval the tech specks will be  
17 implemented and the DSS-CD option will be enabled and  
18 then tested. Procedures in updating the 3D Monicore  
19 Databank and the COLR will also be performed during  
20 the implementation phase. If the request is approved  
21 in the April 2016 time frame -- well, we are ready to  
22 implement on Unit 2 in April of this year and on Unit  
23 3 in May of this year.

24           If there are no questions, I'd like to  
25 turn it over to Andy Olson who will discuss our

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1 MELLLA+ analysis.

2 MR. OLSON: Good morning. I'm Andy Olson,  
3 safety analysis engineer in our Nuclear Fuel  
4 Department.

5 MR. NEFF: Andy, is your mic on?

6 MR. OLSON: Thank you. Slide 15, please.  
7 So one of the key aspects of MELLLA+ implementation is  
8 associated with the available flow window at EPU  
9 operation. For EPU power, as was stated previously  
10 Peach Bottom is licensed for maximum 110 percent core  
11 flow. We can achieve near 110 percent core flow only  
12 at limited conditions, end-of-cycle operation, and for  
13 the most part the operation core flow is limited to  
14 roughly 105, 105½ percent, as noted on the slide here.

15 This results in a practical core flow  
16 operating window for Peach Bottom currently of 101 to  
17 105.5 percent, which is a very narrow operating  
18 window. That's in part due -- the need to maintain  
19 margin to the current minimum MELLLA boundary flow  
20 rate of 99 percent and also due to the fact that the  
21 higher core flows are only achievable at end-of-cycle  
22 operating conditions.

23 In support of MELLLA+ operation we have  
24 completed the supplemental reload licensing report and  
25 analyses. That document has been submitted to the NRC

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1 as supplemental information as part of our submittal,  
2 our license amendment request.

3 The reload analysis for MELLLA process  
4 based on the current operating core design -- that  
5 core design for both the units was developed in  
6 anticipation of implementing MELLLA+, so the impacts  
7 of MELLLA+ operation are already considered and built  
8 in to that design. There are some minor impacts on  
9 the critical power thermal limits for operation during  
10 MELLLA+. This reflects changes in the safety limited  
11 MCPR due to MELLLA+-specific adders and uncertainty  
12 requirements. And we can get into further details of  
13 that during the closed session.

14 There are no impacts to linear heat  
15 generation rates limits, nor any are there any impacts  
16 to the maximum average planar linear heat generation  
17 rates associated with LOCA. The analysis is complete  
18 and ready for implementation.

19 The MELLLA+ SRLR also contains an updated  
20 stability section to reflect the change to the DSS-CD  
21 methodology. All the required DSS-CD information  
22 including backup stability protection and automated  
23 backup stability protection values are included as  
24 necessary.

25 Appendix F of the SRLR identifies all

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1 applicable limitations and conditions for Peach Bottom  
2 associated with the Interim Methods Licensing Topical  
3 Report and the new Appendix G has been added to  
4 address the applicable limitations and conditions  
5 associated with the MELLLA+ Licensing Topical Report.

6 So in summary, all the required reload  
7 analyses to support MELLLA+ operation are complete and  
8 ready to go. We have actually just finished updating  
9 the COLR to reflect MELLLA+ in anticipation and the  
10 reactor core are designed to support MELLLA+  
11 operation.

12 MEMBER REMPE: Thank you.

13 MR. NEFF: Good. If there aren't any  
14 questions, I'd like to turn over now to Dave Turek in  
15 Operations.

16 MR. TUREK: Good morning. My name's Dave  
17 Turek. I am the operations manager at Peach Bottom.  
18 I'd like to go over the Peach Bottom operations and  
19 training portions of MELLLA+.

20 So there are a couple limitations to  
21 MELLLA+ as far as operating goes. One would be  
22 operation in single loop operations. It's an  
23 immediate exit of the MELLLA+ region. In addition to  
24 that, feedwater heating out of service and  
25 specifically greater than a 10-degree Fahrenheit

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1 reduction in feedwater temperature would again be a  
2 exit the MELLLA+ domain, if you will.

3 Next slide. Again, with the changes as  
4 you were aware from Subcommittee, we do have some tech  
5 spec changes that are required as part of MELLLA+ from  
6 the OPRM upscale function. Set point changes are  
7 situated with simulated thermal power, the high trip  
8 function. Again, the single loop ops, very clear  
9 direction to exit the MELLLA+ region immediately. And  
10 then again, changes to tech spec administrative  
11 sections that has to do with report generation under  
12 various conditions.

13 Next slide. For the ATWS instability  
14 there are new time-critical operator actions. Now  
15 before I get into discussing those, I just want to  
16 make sure that I'm clear with you that the actions  
17 that we are taking to combat an ATWS or even an ATWS  
18 instability-type event are unchanged. It was our  
19 existing EOP strategy from before and it continues to  
20 be our EOP strategy going forward, however, the time  
21 criticalness is the new part of MELLLA+.

22 We have three time-critical operator  
23 actions: Initiate reactor water level reduction less  
24 than 120 seconds; injection of standby liquid control  
25 System or boron in less than 120 seconds; and

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1 initiation of suppression pool cooling within 660  
2 seconds. Again, those strategies were all part of our  
3 EOP previously, but they didn't have the time-critical  
4 nature then.

5 CHAIRMAN BLEY: Time-critical is the  
6 numbers you have up here or does it have some other  
7 meaning?

8 MR. TUREK: Time-critical meaning in order  
9 to meet the analysis the analytical part of the design  
10 of MELLLA+. Those are the numbers that are assumed in  
11 the design, therefore we need to be less than those  
12 numbers, less than or equal.

13 CHAIRMAN BLEY: Before MELLLA+ were there  
14 different time limits?

15 MR. TUREK: There were no time limits.

16 CHAIRMAN BLEY: There were no time limits?

17 MR. TUREK: No time limits.

18 (Simultaneous speaking.)

19 CHAIRMAN BLEY: -- supposed to do these?

20 MR. TUREK: That's correct.

21 CHAIRMAN BLEY: Okay.

22 MR. TUREK: And we did do those in the  
23 past. So what we were tasked with was how do we go  
24 change our operating strategy, still maintaining plant  
25 design, and meet those time limits. So we had to get

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1 a group of people together to determine how we were  
2 going to do that. And we came up with -- not knowing  
3 the industry, came with rapid response cards. We used  
4 them for other applications at Peach Bottom. It's not  
5 a new --

6 CHAIRMAN BLEY: Just --

7 MR. TUREK: Yes?

8 CHAIRMAN BLEY: -- for my information --  
9 I was not at the Subcommittee meeting.

10 MR. TUREK: Yes, that's correct.

11 CHAIRMAN BLEY: Did you have record --  
12 well, you did -- records from your training and drills  
13 in the past for these 120-second items? How long did  
14 it normally take people to get to these points?

15 MR. TUREK: We did not have data from  
16 before, but I will be covering that in an upcoming  
17 slide specifically.

18 CHAIRMAN BLEY: Oh, okay.

19 MR. TUREK: Yes. So, yes, we had a design  
20 how we were going to go do exactly what you're asking.  
21 How do we know that we're going to be able to meet the  
22 120 seconds? So we established new rapid response  
23 cards specifically to deal with ATWS. And again, it  
24 will handle a situation for an ATWS or an ATWS-I.  
25 It's the same exact actions that are taken.

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1           So we put an operating crew together,  
2 worked with engineering, worked with the MELLLA+ team  
3 to streamline our already existing EOP strategy, maybe  
4 move some things around to get to these actions  
5 quicker without taking away the command and control  
6 part of the controlling supervisor and not minimizing  
7 the important communications.       Streamlining  
8 communications, eliminating those that aren't need,  
9 but make sure that we're not taking away the things  
10 that make us very successful in transients and actions  
11 such as communication command and control team work.

12           MEMBER STETKAR: David?

13           MR. TUREK: Yes.

14           MEMBER STETKAR: You mentioned moving  
15 things around in the EOP so that the operators get to  
16 these actions more quickly. Can you give us some idea  
17 of what kinds of things you moved around so -- that  
18 you postponed?

19           MR. TUREK: Yes, so we did not change the  
20 EOPs, if that's what --

21           (Simultaneous speaking.)

22           MEMBER STETKAR: It --

23           MR. TUREK: What we did is --

24           (Simultaneous speaking.)

25           MR. TUREK: No, what we did is we arranged

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1 a rapid response card such that we could eliminate any  
2 inefficiencies to get to those actions that are  
3 already in our EOPs to --

4 MEMBER STETKAR: Okay.

5 MR. TUREK: -- for example, initiate  
6 alternate rod insertion.

7 MEMBER STETKAR: Okay.

8 MR. TUREK: Lower level is there. Direct  
9 standby liquid. Trip recirc pumps 10 seconds a part.  
10 We did not --

11 (Simultaneous speaking.)

12 MEMBER STETKAR: But the flow chart didn't  
13 change?

14 MR. TUREK: The flow chart didn't change.  
15 That's right. It didn't change.

16 MEMBER STETKAR: Flow chart didn't change,  
17 but your rapid response cards changed, your existing  
18 rapid response cards changed?

19 MR. TUREK: That's correct. Because what  
20 we did was able to the rapid -- it's actually a brand  
21 new rapid response card. I just want to be clear.

22 MEMBER STETKAR: Yes, but if I had been  
23 operating at the station for the last 30 years of my  
24 life, I had some rapid response cards --

25 MR. TUREK: Absolutely.

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1 MEMBER STETKAR: -- for some part of that  
2 tenure. And you've changed that?

3 MR. TUREK: Yes, it's a new rapid response  
4 card, but it's not unlike other rapid response cards  
5 that I have, to your point. We had rapid response  
6 cards for other --

7 MEMBER STETKAR: Let me try to see if I  
8 can get an answer. Did you prior to this have rapid  
9 response cards for ATWS events?

10 MR. TUREK: We did not.

11 MEMBER STETKAR: You did not? Thank you.

12 MR. TUREK: There you go. Thank you.

13 MEMBER STETKAR: Then I have no more  
14 questions about that.

15 (Laughter.)

16 MEMBER REMPE: I have a question about the  
17 third time-critical action. If I read what the staff  
18 has here, in their draft SE they have that the TCA  
19 associated with initiation of RHR suppression pool  
20 cooling at 660 seconds into an ATWS event was an  
21 existing TCA that was implemented as part of the Peach  
22 Bottom Atomic Power Station EPU.

23 MR. TUREK: That is correct. Eleven  
24 minutes.

25 MEMBER REMPE: Okay. Just a few minutes

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1 ago you just said we have three new. So you only have  
2 two --

3 MR. TUREK: I'm sorry. Two new. I  
4 apologize. You're correct. It is two, just to be  
5 clear.

6 MEMBER REMPE: That's the way the staff  
7 characterized it.

8 MR. TUREK: One and two, and then the  
9 third was existing. Yes, thank you for that  
10 correction.

11 MEMBER REMPE: Thank you. Yes.

12 MR. TUREK: Next slide. So again, these  
13 rapid response cards were in place when we did our  
14 audit back in May of 2015. And again, the operating  
15 crew that was assigned development of these MELLLA+  
16 ATWS-I time-critical operator actions have since been  
17 put into place. They're approved now. They're for  
18 use even though we don't have MELLLA+. They did  
19 improve our overall ATWS response time, so have  
20 implemented those rapid response cards now pre-  
21 MELLLA+.

22 CHAIRMAN BLEY: Can you tell me a little  
23 bit about how you used the cards? I've seen different  
24 kinds of plants have similar things. Some do them  
25 from memory and then go back and check against the

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1 cards; some do them from the cards.

2 MR. TUREK: We do them from the cards, not  
3 from memory. There is a slide, if you want to go to  
4 slide -- go to the last slide, slide 50, if you have  
5 it.

6 But the rapid response cards are --  
7 they're short.

8 CHAIRMAN BLEY: Yes.

9 MR. ENNIS: Intentionally short. They're  
10 at the work location. If you look at this picture  
11 here, this is a reactor operator that's facing the  
12 reactor controls with the full core display overhead.  
13 The rapid response cards, if you look to the lower  
14 right, you see the little bin that's there. That's  
15 where the rapid response --

16 CHAIRMAN BLEY: Okay.

17 MR. TUREK: Situated right on front of  
18 there there's a brass switch above that book that is  
19 the control switch for standby liquid control. So it  
20 is right there for initiation of standby liquid.

21 The rapid response cards for ATWS for the  
22 RO would be right where he's standing in front of  
23 another bin to the left. When you look at this  
24 picture here, he has the full core display, which is  
25 all the control rod indication. Very easy to

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1 determine control rod movement.

2 Down in front of him in the darker blue  
3 and black consoles would be reactor power, also where  
4 we can monitor for instability, core-wide instability,  
5 and even out-of-phase instability.

6 And then directly in front of his left  
7 hand there the other brass switch is the reactor  
8 control switch with the startup, shutdown, hot standby  
9 and refuel. So that kind of gives you an idea of  
10 where they're at.

11 So the way that the rapid response cards  
12 work is we get a failure to scram, easily recognizable  
13 from the operator, either from alarms, indications of  
14 rods, indication of reactor power. He calls out an  
15 entry and I have had a failure to scram. We enter our  
16 EOP, which would be our T-101, power above one percent  
17 and not shut down. And the supervisor then would give  
18 the update to implement the rapid response cards.

19 They would take their initial actions.  
20 And then they pause at certain areas. I'm ready to  
21 inject SLC, standby liquid. And that supervisor then  
22 gives him that direction. And the same with the other  
23 reactor operator. The assist reactor operator would  
24 give that report that I'm ready to lower level.

25 MEMBER STETKAR: Dave?

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1 MR. TUREK: Yes.

2 MEMBER STETKAR: While we're talking about  
3 that, at Peach Bottom before you initiate SLC or drop  
4 level do you have to manually inhibit or block ADS?

5 MR. TUREK: Yes, we do.

6 MEMBER STETKAR: If so, who does that and  
7 where on this little picture is that action taken?

8 MR. TUREK: Okay. It's done by the plant  
9 reactor operator, which is the second assist reactor  
10 operator. And it's not shown on this picture. It  
11 would actually be about --

12 MEMBER STETKAR: That's a pre-condition  
13 before you do either of these things?

14 MR. TUREK: That's correct.

15 MEMBER STETKAR: Because that would arm  
16 ADS?

17 MR. TUREK: That's correct.

18 MEMBER STETKAR: Okay.

19 MR. TUREK: Very specifically called out  
20 in the procedure.

21 MR. ARMSTRONG: That's the volt controlled  
22 switches.

23 MR. TUREK: Two switches. That's right.

24 MEMBER STETKAR: I was just getting a  
25 sense to make sure the other members understand the

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1 sequencing of things, because you're focusing only on  
2 the three -- the two really that's --

3 MR. TUREK: Yes, I mean --

4 MEMBER STETKAR: -- listed as relevant to  
5 MELLLA+.

6 MR. TUREK: And that's why --

7 MEMBER STETKAR: Other people have other  
8 things that they need to be doing in this sequence.

9 MR. TUREK: That's correct. That's why  
10 it's important not to take away that command and  
11 control with how we have them set up because if  
12 certain actions, other actions are successful, then it  
13 may preclude having to take these ATWS actions.  
14 That's correct.

15 Next slide. So here's the question that  
16 you were asking earlier around do we have times  
17 associated with how we're implementing these actions.

18 CHAIRMAN BLEY: I'm sorry. Could you pop  
19 that up to full screen?

20 MR. TUREK: I think so.

21 MEMBER REMPE: You go to view.

22 MR. TUREK: Okay. So the audit crew.  
23 Again, this was licensed operators working with the  
24 MELLLA+ team engineering, and they developed these  
25 actions. They developed a method on how to better

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1 implement this strategy now that we have two new time-  
2 critical operator actions. And you can see there the  
3 required time is 120 seconds.

4 MEMBER STETKAR: Dave, again for the  
5 purposes of the folks who haven't heard this story  
6 before, the audit crew was the well-trained SLC people  
7 that developed this and they were trying to determine  
8 whether they were feasible, right?

9 MR. TUREK: Absolutely.

10 MEMBER STETKAR: Okay.

11 MR. TUREK: Absolutely.

12 MEMBER STETKAR: So they weren't a  
13 randomly sampled operating crew?

14 MR. TUREK: No, no, not at all. And  
15 that's exactly --

16 (Simultaneous speaking.)

17 MEMBER STETKAR: I just wanted to make  
18 sure that when it says "audit," this doesn't -- the  
19 connotation of the randomly sampled crew that the NRC  
20 may have audited, for example.

21 MR. TUREK: No. No, that's a good point.  
22 This crew was -- you're right. From start to finish  
23 the same crew was tasked with developing and honing  
24 the strategy to implement our ATWS time-critical  
25 operator actions. And as you can see there, their

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1 outage completion time from SLC and -- this is from  
2 time of the ATWS to SLC injection was 54 seconds. And  
3 to initiate reactor water level reduction was 79  
4 seconds.

5 Now to your point, then in August, once we  
6 had it refined and what we wanted, we now rolled that  
7 out to all of the five operating crews for them to  
8 become proficient in it. We ran them through multiple  
9 times. And again, the rapid response cards are  
10 approved today and in use so we can still test this.  
11 And as you can see, not unsurprisingly, the average  
12 time for them to complete, to your point, was a little  
13 higher because again the licensed operators that were  
14 part of the audit crew absolutely were part of  
15 developing it. So they had it down much more.

16 MEMBER STETKAR: But those five operating  
17 crews also knew that they were going to be tested on  
18 ATWS events? Was this part of their routine --

19 MR. TUREK: For some and not for some. In  
20 other words, obviously when we rolled out the new  
21 time-critical operator actions with the rapid response  
22 cards, we needed them to gain some initial training  
23 and proficiency of just doing those. But since then  
24 we don't tell them that -- not in all cases do we tell  
25 them what scenario we're going to run.

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1 CHAIRMAN BLEY: But these numbers were for  
2 the guys who were primed for this?

3 MR. TUREK: The top ones were. The bottom  
4 ones were -- yes, through practice. That's exactly  
5 right. Through practice trial --

6 MEMBER STETKAR: They aren't random  
7 samples --

8 MR. TUREK: They are not.

9 MEMBER STETKAR: -- for routine simulator  
10 training?

11 MR. TUREK: That's correct.

12 MEMBER STETKAR: Because you haven't  
13 gotten that far yet.

14 MR. TUREK: That's correct.

15 MEMBER STETKAR: Okay.

16 MEMBER SKILLMAN: David, what does  
17 "average duration" for your audit crew?

18 MR. TUREK: Deviation.

19 MEMBER SKILLMAN: Deviation?

20 MR. TUREK: Yes, that's between operators.  
21 Like you have X amount of operators. You did it X  
22 amount of time. How much was each of the crews off,  
23 if you will?

24 (Simultaneous speaking.)

25 MEMBER SKILLMAN: Wait a minute. A crew

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1 is comprised of so many operators?

2 MR. TUREK: Yes, two --

3 MEMBER SKILLMAN: So you have one audit  
4 crew?

5 MR. TUREK: That's correct.

6 MEMBER SKILLMAN: So what does "deviation"  
7 mean relative to the audit crew? That's one crew.  
8 These are multiple exercises?

9 MR. TUREK: Multiple exercises. That's  
10 correct.

11 MEMBER SKILLMAN: And in each case they  
12 know --

13 MR. TUREK: That's correct.

14 MEMBER SKILLMAN: -- the scenarios coming  
15 at them?

16 MR. TUREK: That's correct.

17 MEMBER SKILLMAN: Okay. Now for the  
18 deviation for the five operating crews they don't  
19 always know exactly what the scenario is that's coming  
20 at them?

21 MR. TUREK: For this training; and, Tony,  
22 you correct me if I'm wrong, for this I believe they  
23 always knew that this was the scenarios that we were  
24 running, sir, that it was ATWS. Again, brand new  
25 procedure, brand new requirements. How to teach the

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1 operators that this is how we're going to implement  
2 ATWSs. That's the deviation that we're talking about  
3 there.

4 MEMBER BALLINGER: So what was the range?

5 MR. TUREK: The highest for -- I can give  
6 you the highest. For example, the high for standby  
7 liquid injection was 103 seconds, and the high for  
8 reactor water level reduction was 105 seconds.

9 MEMBER BALLINGER: For the five operating  
10 crews?

11 MR. TUREK: For the five operating crews.  
12 That's correct.

13 MEMBER BALLINGER: Hundred and five?  
14 Okay.

15 MR. TUREK: That's correct.

16 MEMBER REMPE: But you said today that  
17 you've since then done testing where they weren't  
18 primed. And did you see some deviation and is it a  
19 much higher number now?

20 MR. TUREK: Well, just to be clear, what  
21 we've done is we've implemented the training. We  
22 haven't done any evaluation of them with this yet.

23 MEMBER REMPE: Okay.

24 MR. TUREK: We're still in training. I  
25 just want to be clear on that.

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1 MEMBER REMPE: Okay.

2 MR. TUREK: Okay? Because that's  
3 important from a proficiency -- now, I will tell you  
4 from an audit crew to the five operating crews, by  
5 nature of training I expect their times will continue  
6 to get better.

7 MEMBER REMPE: Okay.

8 MR. TUREK: Because from the initial --  
9 and I'll get -- let's go to the next slide. I can  
10 explain it better on the next slide.

11 So part of the ACRS Subcommittee asked can  
12 you give us some examples of some real plant-type  
13 transients that we could show operator initiation  
14 within a certain time frame? So we went back and  
15 looked. There was two separate reactor recirc pump  
16 trips. One occurred on August 30th, 2013 and one  
17 occurred in February 19th of 2015. On a single recirc  
18 pump trip we're required to enter an operational  
19 transient procedure and we have immediate operator  
20 actions to insert a pre-described listing of rods to  
21 get us down outside of the instability region.

22 So as you can see from our recirc pump  
23 trip, this is closely related to MELLLA+-type  
24 strategies there. And you can see the two separate  
25 crews. These were done on night work, these events.

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1 Obviously had no clue that we were going to have a  
2 reactor recirc pump trip on either of these two nights  
3 27 months apart. And the operators because of their  
4 training and the repetitiveness of their training and  
5 the way that we evaluate them on their training, you  
6 can see that one crew responded in 30 seconds  
7 following a pump trip. This was for rod insertion.  
8 And the second one responded in 31 seconds. Highly  
9 repeatable, again based on their training.

10 So now you get into the difference between  
11 -- well, let's go to the next slide. Because there  
12 what I say is that for -- we ran this in a training-  
13 type scenario then. Same exact thing. Did not tell  
14 the crew what they were going to get in a recirc pump  
15 trip.

16 MEMBER STETKAR: Dave, when said "next  
17 slide," you meant the --

18 MR. TUREK: I'm sorry.

19 MEMBER STETKAR: -- next bullet item on  
20 the previous slide?

21 MR. TUREK: Yes.

22 MEMBER STETKAR: Okay.

23 MR. TUREK: So I want to go to the  
24 training simulation. So we then ran this on a crew  
25 over in a simulator so that we could understand

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1 initial operator response. And they did not know what  
2 scenario they get, but obviously by virtue of placing  
3 them in the control room simulator --

4 PARTICIPANT: Something's going to happen.

5 MR. TUREK: Exactly. They know that --  
6 yes, there's only so much that we can keep from them,  
7 but they didn't know what. And they were able to do  
8 their initial operator actions within 16 seconds. So  
9 a little bit of a difference there between real life  
10 control room to a simulator-type setting.

11 The biggest thing to take away is that  
12 with the new strategy and the pre-planned steps the  
13 remainder is consistent throughout. We do the same  
14 actions regardless of whether it's an ATWS with  
15 instability or an ATWS to allow us to implement that  
16 strategy. And I believe that that strategy is what  
17 they've used in other stations for us.

18 Now go to the next slide.

19 MEMBER BALLINGER: So what this means --

20 MR. TUREK: Yes, sir?

21 MEMBER BALLINGER: -- is that it's not a  
22 factor of two.

23 MR. TUREK: It's not a factor of two.

24 MEMBER BALLINGER: That factor of 15  
25 seconds is really a realization factor.

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1 MR. TUREK: That's exactly right.

2 MEMBER BALLINGER: They suddenly realize  
3 what's going on, right?

4 MR. TUREK: That's exactly right. It is  
5 not a factor of two.

6 MEMBER POWERS: How do you know that?

7 MEMBER BALLINGER: I don't.

8 MEMBER POWERS: I mean, it seems to me I  
9 think we can interpret this --

10 (Simultaneous speaking.)

11 MEMBER BALLINGER: That's what I'm saying.

12 CHAIRMAN BLEY: Microphone.

13 MEMBER POWERS: -- interpret it as a  
14 factor of two.

15 MR. TUREK: Right. And it's based on what  
16 we see, the way we conduct our training and the way  
17 that we have real life plant transients. It is  
18 exactly as you talked about, a factor of realism  
19 there. In real life recognizing an alarm or a  
20 condition, diagnosing that condition, communicating  
21 that to the crews, making sure you're right before you  
22 take action.

23 And the plan is going to be a little bit  
24 different than if you're on a simulator knowing that  
25 if you're wrong, you can reset. You can't do that in

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1 real life. So there is a little bit of a delay there.  
2 It's not a doubling of the time to do the action.  
3 It's all around the initial identification,  
4 communication, diagnosis and then implementing your  
5 initial operator actions.

6 MEMBER SKILLMAN: David, were there any  
7 enhancements to the information provided to the  
8 operators? Were there different alarms or different  
9 indicators or different array in terms of human  
10 factors that gave them different information?

11 MR. TUREK: There was not. As a matter of  
12 fact, we didn't even use an STA, which would normally  
13 be part of a training scenario, because with a recirc  
14 pump trip it happens very quickly, not taking into  
15 account that that STA is going to be standing right  
16 there. So we kept it to the exact same crew size that  
17 they had to respond to in the plant.

18 MEMBER SKILLMAN: Okay. Thank you.

19 MR. TUREK: You're welcome.

20 MEMBER BALLINGER: Let me correct my  
21 answer. My Naval experience that is the difference.  
22 When you're having an ORS Board, or whatever they call  
23 at, the time where you know something is going to  
24 happen, you're primed to react, whereas when it  
25 happens in real life people are just drinking their

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1 coffee and stuff like that. So there's a little bit  
2 of a dashpot going on. It's 10 or 15 seconds before  
3 people get engaged, I guess is another way to look at  
4 it.

5 Am I right, Charlie? Or Dennis.

6 MEMBER BROWN: Except when the scram alarm  
7 goes off. They don't have to wait.

8 MEMBER BALLINGER: No.

9 (Laughter.)

10 MEMBER BALLINGER: True. That's true.

11 MEMBER BROWN: They know exactly what to  
12 do.

13 MR. TUREK: That's correct. All right.  
14 Next slide. So anyway, we've already talked about  
15 this slide, everyone. The operator actions are  
16 similar for every ATWS. We do have a five-week  
17 training cycle again to reinforced familiarity. It's  
18 very repeatable. Much like a lot of our other  
19 training it's very systematic and that based on our  
20 analysis in the 120 seconds and taking into account  
21 our real-life events, we believe that there's adequate  
22 margin there with room for us to continue to improve  
23 as we continue our training.

24 Next slide, please. So you heard earlier,  
25 and I just want to reinforce, implementation of

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1 MELLLA+ for us at Peach Bottom from a operations  
2 perspective is all around minimizing the amount of  
3 reactor power manipulations we have, not because we  
4 can't make reactor power manipulations and not because  
5 we can't do them correctly, but there's an inherent  
6 risk always to maneuvering the power plant when you  
7 don't have to. And that greater flexibility with core  
8 flow is an easier, if you will a more -- it's just  
9 better for the operator not having to have those  
10 challenges of constantly moving reactor power,  
11 notching rods and changing flow. And again, the  
12 capacity factor there.

13 We are ready to implement MELLLA+. We do  
14 have a plan in place to implement MELLLA+. We've  
15 already done the hardware and software changes, as  
16 you've heard. We've completed the training and we're  
17 continuing to train our operators on ATWS. We do ATWS  
18 training generally speaking more than any other type  
19 of training because it drives us deeper into our EOPs  
20 generically. So we do get a lot of hands-on training  
21 there. And we are ready to implement the tech specs,  
22 the procedures and the testing upon approval.

23 Next slide.

24 MEMBER REMPE: Okay. At this --

25 MR. TUREK: And, Chairman, go ahead.

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1 MEMBER REMPE: Yes, at this point do the  
2 members have any questions they want to bring up,  
3 because we're going to go into closed session. And  
4 because of the gyrations required with closing the  
5 phone lines and all that, I'd like to ask that we open  
6 the phone lines and let the public make comments, if  
7 they have any.

8 And while we're waiting for that to occur,  
9 is there anyone in the room who wants to make a  
10 comment?

11 (No audible response.)

12 MEMBER REMPE: Okay. So we'll just have  
13 to wait a minute here until we get that open.

14 (Pause.)

15 MEMBER REMPE: Thank you, by the way, for  
16 providing the simulator versus real time operation.

17 MR. TUREK: You're welcome.

18 MEMBER REMPE: That was one of the  
19 questions that was brought up during the Subcommittee  
20 meeting.

21 (Pause.)

22 MEMBER REMPE: Okay. We need have, if  
23 there's anyone out there, even if you don't have a  
24 comment, to speak up and let us confirm that we do  
25 have a member of the public out there that can provide

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1 a comment.

2 (No audible response.)

3 MEMBER REMPE: And with the lack of  
4 anybody responding, but hearing some funny sounds and  
5 the noise level, I'd suggest we do have it open.

6 And then let's close it. And now we need  
7 to have confirmation that the slides that are  
8 presented are not being broadcast out. And we'll have  
9 to wait for that.

10 Oh, can someone who knows who should and  
11 shouldn't be in the room verify that there's not  
12 anyone who shouldn't be here in the room?

13 (Off microphone comment.)

14 MEMBER REMPE: Okay. So it's all safe and  
15 we know that for sure?

16 PARTICIPANT: Yes.

17 MEMBER REMPE: Okay. And can you verify  
18 that there's no one in the room that shouldn't be  
19 here? Looks good?

20 MR. SAENZ: I don't see anybody.

21 MEMBER REMPE: Good. Thank you.

22 (Whereupon, the above-entitled matter went  
23 off the record at 10:55 a.m. and resumed at 2:02 p.m.)

24 CHAIRMAN BLEY: We will come to order.

25 And I will turn this meeting on Reg Guide 1.127 over

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1 to Mr. Harold Ray. Harold?

2 MEMBER RAY: Thank you, Mr. Chairman.

3 Back in November, November 18th, the  
4 Regulatory Policies and Practices Subcommittee met  
5 with the Staff to review what was then entitled the  
6 Design and Inspection Criteria for Water-Control  
7 Structures Associated with Nuclear Power Plants.

8 It now is titled as you see on the screen  
9 here, but that is just a change in title, not a change  
10 in scope. But it more accurately reflects I think the  
11 -- the scope, and that is criteria and design features  
12 for inspection of water-control structures associated  
13 with nuclear power plants.

14 This Reg Guide has had public comments  
15 completed in March of last year, now incorporated.  
16 That will be part of the Staff presentation today.

17 The Subcommittee did review an early draft  
18 prior to the events I just described back in February  
19 of 2012. It came to the Full Committee in October of  
20 '14, and at that time, the Full Committee said they  
21 wanted to see it after the public comment period, and  
22 the comments had been incorporated, so we are now at  
23 that point.

24 The background will be described I think  
25 quite fully having looked at the slides the Staff is

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1 planning to present, so I will say nothing more except  
2 to ask Tim Lupold to make any comments that he would  
3 like to make before we go forward.

4 MR. LUPOLD: Thank you. My name is Tim  
5 Lupold. I am with the Office of Nuclear Reactor  
6 Regulation.

7 And as Mr. Ray stated, we had come in back  
8 in November, and we discussed some of the changes to  
9 the Regulatory Guide, and there were still a few  
10 comments at the Subcommittee meeting. And we welcome  
11 the opportunity to come here today and to tell you how  
12 we resolved those comments, which we have.

13 We have actually two individuals that are  
14 sitting up front, Mark Orr from the Office of  
15 Research, Regulatory Research, and from my staff, we  
16 have Rob -- Bob Pettis. And he will be going through  
17 the presentation today to let you know what changes we  
18 made to the document.

19 All right, thank you.

20 MEMBER RAY: Gentlemen, proceed.

21 MR. PETTIS: Okay. Slide two is probably  
22 a good place to begin, since --

23 MEMBER RAY: Are we sure we've got the  
24 microphones on? That is always a pre-condition here  
25 for the new system so that we get all of your words

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1 captured. Down at the bottom.

2 MR. PETTIS: Just to recap what -- what  
3 Mr. Ray had said with respect to being here back in  
4 November, some of this is a little -- a little  
5 repetitive, but later on, I have a slide that  
6 consolidates some of the ACRS comments back in that --  
7 in that meeting that we'll go over.

8 The purpose of the Revision of the Reg  
9 Guide basically standardizes existing Staff positions,  
10 focuses on applicable NRC regulations, provides design  
11 and inspection guidance, incorporates public comments  
12 which were received -- we had one set of public  
13 comments from one particular source, one particular  
14 licensee, that basically were addressed and  
15 reconciled, and the Committee has a copy of those --  
16 of those comments, and I will be glad to go over those  
17 if you would like.

18 Incorporates public comments, and also  
19 responds to the ACRS comments from November --

20 CHAIRMAN BLEY: Now just for the record,  
21 this is picayune, but we have to say it, those were  
22 not ACRS comments, those were comments by Members of  
23 the Committee, since we only speak in our letters.

24 MR. PETTIS: Okay. Well, well noted.

25 On page 3, we have some of the Federal

1 Guidelines that basically are associated with the --  
2 with this Reg Guide, or at least the subject matter.  
3 This Reg Guide Rev. 1, we are talking 1979 vintage, so  
4 this Reg Guide has not had the benefit of any revision  
5 in, you know, over 30 plus years, so since then, there  
6 has been quite a knowledge base of information that  
7 has been -- that has been collected, and the purpose  
8 of the Guide was to try to -- was to try to  
9 incorporate that into -- into this new Revision.

10 So we have FEMA Guidelines, we have  
11 Guidelines on multiple types of water-control  
12 structures, not just dams, we have FEMA Guidelines,  
13 FEMA 93 which has to do with the Dam Safety Program,  
14 we have FEMA Guidelines, there's some information in  
15 the SRPs.

16 Other Reg Guides have also been revised as  
17 well. One that comes to mind is the Ultimate Heat  
18 Sink, 1.26 I believe. They have all been revised and  
19 actually reflect in their -- in their references Reg  
20 Guide 1.127, so there has been a connection between  
21 some of the existing Reg Guides and also this one.

22 On page 4, Reg Guide 127 revised to agree  
23 with Staff guidance. And these are some of those.  
24 Reg Guide 311, Design Construction and Inspection of  
25 Embankment Retention Systems at Uranium Recovery

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1 Facilities, and the NUREG 0800 SRP, and the two  
2 sections, Section 2.5.4 on Stability of Subsurface  
3 Materials, and Section 2.5.5., Stability of Slopes.

4 And then we have various NRC inspection  
5 procedures as well. We can go to page 5. We've got  
6 General Design Criterion 45, Inspection of Cooling  
7 Water Systems, which is pretty much the -- the core  
8 regulatory requirement. It requires cooling water  
9 systems to be designed to permit the appropriate  
10 periodic inspection of important components to ensure  
11 integrity and capability of the system.

12 We have some references to 50.34(a), 50.34  
13 (b)(4), with respect to applicants providing analysis  
14 and evaluation. We have an added reg in there for  
15 Part 52 plants.

16 We can go to page 6. The guidance that we  
17 have in the Reg Guide basically provides guidance for  
18 licensees and applicants for developing an in-service  
19 inspection program and surveillance program, which is  
20 -- which is really the -- the thrust of the Reg Guide.  
21 It is to have -- give them some guidance so that they  
22 can incorporate that guidance into their inspection  
23 programs.

24 MEMBER RAY: Well let me interrupt here  
25 and just say, this particular slide six preserves the

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1 for me misleading inference that this is design  
2 guidance, whereas the corrected title makes the  
3 important point that it's design features for  
4 inspection. In other words, it's not for design of  
5 the structures, it's design for inspection of the  
6 structures.

7 MR. PETTIS: Correct.

8 MEMBER RAY: And that's where I think now  
9 there is clarity in the title. I just note here on  
10 this slide, it talks about design and inspection  
11 guidance, which one could read to mean that there is  
12 guidance for the design of the structures here, but  
13 it's actually design for inspection of these  
14 structures --

15 MR. ORR: Correct.

16 MEMBER RAY: -- that we're talking about.

17 MR. ORR: We want the -- the structures  
18 designed so they can be inspected.

19 MEMBER RAY: That is right, but for  
20 existing structures and so on for example --

21 MR. ORR: Yes.

22 MEMBER RAY: -- which this covers,  
23 existing as well as new structures, and structures  
24 that are both a part of a plant and those that are  
25 relied on by the plant that aren't part of the plant.

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1 MR. ORR: Correct.

2 MEMBER RAY: So bottom line is, it is  
3 design of the inspection program and instrumentation  
4 and capability to do inspections that -- that we're  
5 talking about here.

6 MR. ORR: Yes.

7 MEMBER RAY: Okay.

8 MEMBER STETKAR: Don't go back. I have  
9 read now several versions of this thing, and for the  
10 life of me, I still can't understand the scope of  
11 this, so I would like on the record the answers to  
12 some questions.

13 If I have a dam upstream from the plant  
14 that impounds water, and failure of that dam can cause  
15 flooding of the site, is that dam included in the  
16 scope of this Reg Guide? That's a yes or a no.

17 MR. PETTIS: Yes.

18 MEMBER STETKAR: Okay. That dam does not  
19 impound water for the emergency cooling system. That  
20 dam simply impounds water such that if that dam fails,  
21 my site will be flooded.

22 MR. ORR: Correct.

23 MEMBER STETKAR: And this does include  
24 that. Okay. Because I will tell you, I can find  
25 words in this Reg Guide that can be interpreted many

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1 different ways, and the use of "emergency cooling" and  
2 the words "safety-related" get thrown around, and I  
3 need answers to this because I don't understand what  
4 the scope of this Reg Guide applies to.

5 MR. PETTIS: I'm going to have --

6 MEMBER STETKAR: I can't understand it  
7 from your visual here.

8 MR. PETTIS: Okay. I'm going to --

9 MEMBER STETKAR: Because the second bullet  
10 still doesn't tell me what it applies to.

11 MR. KARWOSKI: This is Ken Karwoski from  
12 the NRC Staff. I'm the NRC's Dam Safety Officer.

13 With respect to that specific question,  
14 the answer is it depends. If the -- if the dam is  
15 onsite and is used by the utility as part of the  
16 ultimate heat sink, it's a Seismic Category I dam,  
17 then yes --

18 MEMBER STETKAR: No, I got that.

19 MR. KARWOSKI: Okay. But if it's upstream  
20 of the plant, like say 100 miles, and it's owned, or  
21 operated and maintained, by the Army Corps of  
22 Engineers. No, it would not be applicable to those  
23 things.

24 MEMBER RICCARDELLA: What if it's five  
25 miles that's going to --

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1 MR. KARWOSKI: It would all depend on --  
2 on the specific situation, but in general, the answer  
3 would be no because the utility has no control over a  
4 dam that might be privately owned --

5 MEMBER STETKAR: Well it says the Reg  
6 Guide applies to onsite and offsite water-control  
7 structures, e.g. dams, floats, canals, reservoirs, and  
8 associated conveyance facilities, but associated with  
9 the emergency cooling water systems of nuclear power  
10 plants whose failure could either cause site flooding,  
11 the failure of the plant's emergency cooling systems,  
12 or otherwise endanger the plant.

13 So I'm -- I'm -- so it doesn't have to be  
14 onsite. If it's not onsite, it's not clear how the  
15 licensee can inspect it. It can be offsite. It  
16 explicitly says it can be offsite. It's got something  
17 to do with flooding. It's got something to do with  
18 emergency cooling.

19 MEMBER RAY: John, can I chime in?

20 MEMBER STETKAR: Yeah. Well, I am trying  
21 to get --

22 MEMBER RAY: Well, you were asking -- the  
23 last paragraph on page 14 of the document reads as  
24 follows. It is very short.

25 "For water-control structures owned,

1 operated, or regulated by others and relied upon or  
2 taken credit for by licensee" -- do you want me to  
3 finish?

4 MEMBER STETKAR: Yes, keep -- keep going,  
5 because I was going to get to that, but go on.

6 MEMBER RAY: -- " the licensee or  
7 applicant should verify with the owner of said  
8 structures that the occurrence" -- and this is in the  
9 context of inspection following an unusual event --  
10 "that the occurrence of such unusual events did not  
11 impact the structure's ability to perform its intended  
12 safety function."

13 You are certainly correct that this refers  
14 both to onsite and offsite --

15 MEMBER STETKAR: But that is unusual  
16 events. I want to get to -- I will get to that later.  
17 My -- my question is about the fundamental scope --

18 CHAIRMAN BLEY: You were at the  
19 Subcommittee meeting, right?

20 MEMBER STETKAR: I was at the Subcommittee  
21 meeting.

22 CHAIRMAN BLEY: I just --

23 MEMBER STETKAR: But I --

24 CHAIRMAN BLEY: -- memory of the  
25 Subcommittee meeting. My memory there was that the

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1 way it finally ended up that made me comfortable was  
2 that the NRC, not the owner, would in some way have  
3 assurances from the Corps or somebody else of knowing  
4 the Corps' standards, that the same similar standards  
5 were being met --

6 MEMBER STETKAR: I am just --

7 CHAIRMAN BLEY: -- for those structures,  
8 and that's -- that's just my memory. I don't know --

9 MEMBER STETKAR: Let me try something,  
10 though. Suppose I have a dam that impounds water that  
11 I use for my main condenser cooling water system.  
12 I've got another little pond someplace onsite, hole in  
13 the ground that I pump water through for my emergency  
14 core cooling system.

15 So this -- this dam has nothing to do with  
16 my licensing emergency core cooling function. It --  
17 it's a big dam. It impounds, you know, a lake, and I  
18 use that lake, I take suction from it, I run it  
19 through my main condenser, and I cool the rest of the  
20 plant.

21 Dam fails. I get 12 feet of water on my  
22 site. It floods. Does the scope of this Reg Guide  
23 apply to inspections of that dam?

24 MR. PETTIS: The short answer is if the  
25 licensee has taken credit for that dam somewhere in

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1 its design on licensing basis, the answer is yes.

2 MEMBER STETKAR: For flooding, for  
3 example?

4 MR. PETTIS: Well this is not a flooding  
5 Reg Guide.

6 MEMBER STETKAR: Well that's --

7 MR. PETTIS: Which is --

8 MEMBER STETKAR: Well, yes --

9 MEMBER RAY: Let me -- let me try. It  
10 applies, John, insofar as you are able to implement  
11 instrumentation at that dam that you're referring to.

12 MEMBER STETKAR: Don't -- I don't want to  
13 talk about instrumentation --

14 (Simultaneous speaking.)

15 MEMBER STETKAR: I want to talk about the  
16 dam.

17 PARTICIPANT: Go ahead.

18 MEMBER STETKAR: I want to talk about the  
19 dam.

20 MEMBER RAY: I know. I am talking about  
21 the dam, and I am telling you, this is about  
22 instrumentation.

23 MEMBER STETKAR: It is not.

24 MEMBER RAY: It is.

25 MEMBER STETKAR: It is about inspections

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1 of dams --

2 MEMBER RAY: It is --

3 MEMBER STETKAR: -- they could be  
4 instrumented, they could not be instrumented.

5 MEMBER RAY: I am sorry. I should have  
6 used --

7 MEMBER STETKAR: It is inspections.

8 MEMBER RAY: I should have --

9 MEMBER STETKAR: So this is an additional  
10 inspection of the dam.

11 MEMBER RAY: But instrumentation is part  
12 of an inspection program.

13 MEMBER STETKAR: It might be.

14 MEMBER RAY: Typically. But leave that  
15 aside. I should have said --

16 MEMBER STETKAR: Okay.

17 MEMBER RAY: -- inspection. If you can  
18 implement inspection of the dam, then yes, it would be  
19 the guidance that you would follow because it  
20 describes an acceptable means of inspecting that dam.  
21 But does it -- is it required to be implemented? No.  
22 That's, as they were trying to say, that's something  
23 that has to be negotiated, and it depends.

24 So whether or not -- if you take credit  
25 for it, then a reasonable licensing review is going to

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1 say on what basis are you taking credit for it? And  
2 that would then address what the agreement is between  
3 the plant and the owner of that dam that you're  
4 talking about.

5 MEMBER STETKAR: That's -- that's what I'm  
6 --

7 MEMBER RAY: It's just guidance for  
8 inspection. That is all this is.

9 MEMBER STETKAR: I am trying to understand  
10 what taking credit for that dam means. I understand  
11 if that dam impounds my emergency cooling water  
12 system, that's -- that's not what I'm arguing about.  
13 I am -- I am concerned about taking -- what does  
14 taking credit in a regulatory sense of an upstream dam  
15 mean?

16 And if -- is that -- the Staff just said  
17 on the record that that doesn't mean that I'm taking  
18 credit for flood protection, although there are words  
19 in here that seem to say "otherwise endanger the  
20 plant," "could either cause site flooding or otherwise  
21 endanger the" -- flood sounds like endangering the  
22 plant.

23 MEMBER RAY: Your -- your licensing basis  
24 will say whether you are taking credit for the flood  
25 protection of the dam. This provides guidance for

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1 inspection of it, and it -- let's assume that you are  
2 taking credit for it. Then, you can use this guidance  
3 to try and implement an inspection program.

4 MEMBER STETKAR: It -- it does, but it  
5 also defines the scope of the dams for which this  
6 guidance applies, and that is what I am trying to get  
7 to.

8 MEMBER RAY: Well, I guess I'll -- I'll  
9 end now, but I would say the scope is where you are  
10 able or need to implement guidance for inspection.  
11 This would apply. But it doesn't require that it be  
12 implemented at the dam that you're describing.

13 But if you're taking credit for something  
14 that you have no ability to monitor, I would think the  
15 licensing review would raise that as an issue.

16 MEMBER STETKAR: If you built -- if you  
17 look at bullets two and three here on this particular  
18 visual, they kind of illustrate my confusion.

19 Bullet two says applies to the dams, yada  
20 yada yada, associated with emergency cooling water  
21 systems, and -- that's a logical and -- so first, they  
22 have to be associated with emergency cooling water  
23 systems. And -- and then, the others apply.

24 The third bullet just says "Scope includes  
25 embankments and other pertinent structures associated

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1 with or part of a water-control structure typically  
2 built to protect the plant." That to me doesn't have  
3 anything to do with emergency cooling, does it? Maybe  
4 it's a dam that prevents the site from flooding.

5 MEMBER RAY: You're certainly right --

6 MEMBER STETKAR: Or diverts water away  
7 from the site so that it does not flood.

8 MEMBER RAY: You're certainly right. I  
9 think reading the Reg Guide, it doesn't have that  
10 degree of lack of clarity in it --

11 MEMBER STETKAR: Okay.

12 MEMBER RAY: -- as I read the Reg Guide  
13 itself, then. These -- these summary statements here  
14 do have the ambiguity that you're describing.

15 MEMBER STETKAR: Well, I --

16 MEMBER RAY: I can see that.

17 MEMBER STETKAR: -- I've extracted  
18 statements from the Reg Guide that have the same  
19 ambiguity.

20 MEMBER RAY: Well, not to me, but all  
21 right, fine. We'll include it in our comments, then.

22 MR. PETTIS: That -- that third bullet has  
23 more application to -- up in the heat sink than it has  
24 anything else. When we're talking about embankments  
25 and other pertinent structures, there's a --

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1 MEMBER STETKAR: You know, that's what you  
2 just said orally, but that's not what --

3 MR. PETTIS: -- there's an association  
4 that has to do with -- with the UHS. I think -- I  
5 think the big picture here is this is -- when this Reg  
6 Guide first came to -- to ACRS' attention, it came  
7 during maybe a not-so-good time with the Fukushima and  
8 --

9 MEMBER STETKAR: It's still not a good  
10 time regarding flooding and Fukushima, for the record.

11 MR. PETTIS: And there were flooding-  
12 related issues, and --

13 MEMBER STETKAR: There still are.

14 MR. PETTIS: So we were trying to extract  
15 ourselves from flooding because this is not designed  
16 for a flooding Reg Guide.

17 MEMBER RAY: But Bob, you've got to keep  
18 clear that it's talking about inspection programs and  
19 inspection capability, and I think what John is asking  
20 about is does the Reg Guide necessarily apply to a  
21 structure like he described for purposes of inspection  
22 capability?

23 And my answer is I think an answer that  
24 was given early on. It may or may not. It depends on  
25 the agreement reached, in my mind, as part of the

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1 licensing basis.

2 MR. PETTIS: Well, we have --

3 MEMBER RAY: But it does not necessarily  
4 apply.

5 MR. PETTIS: We tried to make it as simple  
6 as possible by basically tying it to the licensee's  
7 design and licensing basis, what they take credit for,  
8 what's safety-related, what isn't. What is it that  
9 the licensee uses this structure, water-control  
10 structure, for? If it's something onsite and it  
11 affects emergency cooling water, they take credit in  
12 their design and licensing basis, it's included.

13 If it's something offsite, which I guess  
14 could be considered outside the controlled area,  
15 owner-controlled area, then they have -- they have  
16 responsibility.

17 The way we tried to account for structures  
18 like -- well, I mean even intake structures. I mean,  
19 they're -- you know, they fall -- they fall under --  
20 under this as well.

21 But let's say there's dams -- I mean, dams  
22 in the dam sense, not a -- a water-retaining device  
23 onsite, but all of the dams, or pretty much all of the  
24 dams, that are located offsite, from at least our  
25 review, seem to have some federal control. They are

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1 either under FERC or they're under some other  
2 federally regulated program.

3 And that is why on the -- on the top of  
4 page 6, we have that paragraph that talks somewhat in  
5 depth about the fact that if one of those dams, for  
6 whatever reason, the licensee is taking some type of  
7 credit for it in their design and licensing basis, and  
8 that plant is regulated by one of the federal partners  
9 that imposes a comparable inspection program, then the  
10 licensee can take credit for that.

11 The ones I think that -- that we do, and  
12 I am maybe speaking out of -- out of turn, I mean Ken  
13 is more familiar, but I think the dams that we inspect  
14 as part of the Dam Safety Program, which is a very  
15 small subset, has really nothing to do with this Reg  
16 Guide per se, I think there's probably 18 or 20 dams  
17 associated with those seven licensee facilities that  
18 we have under the Dam Safety Program.

19 Two -- I think we have a total of nine,  
20 seven operating plants, and we have two uranium  
21 tailing type plants. Out of those seven, I believe  
22 there's 18 or 20 dams that are offsite dams that are  
23 part of the Dam Safety Program that get inspected by  
24 FERC and -- and, you know, TVA and others.

25 So there's probably very few of the

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1 operating plants that may -- and I'm just saying in  
2 general -- that may wind up having a dam that is not  
3 under one of those -- one of those programs. And --

4 MEMBER STETKAR: Now, I am actually less  
5 interested in the operating plants because I know that  
6 that -- you -- you already have a constraint that's a  
7 known sort of quantity. I am worried about the fact  
8 that these Reg Guides get enshrined, and we're going  
9 to have possibly maybe sometime new plants built that  
10 may be built on rivers or whatever, and people will  
11 invoke this Reg Guide, you know, for those plants, so  
12 I am trying to understand how they might apply to  
13 those plants.

14 MEMBER RAY: Well John, does it help to --  
15 this sentence in the paragraph he was just referring  
16 to -- for offsite, water-control structures not  
17 regulated by another federal or state agency -- I know  
18 you've got this all in mind, I am just trying to get  
19 you --

20 MEMBER STETKAR: I got -- I got that. I  
21 understand how -- how that. I am still trying to  
22 understand whether or not the scope of this applies  
23 only to dams for which a licensee somehow includes  
24 credit in their licensing basis as part of their  
25 emergency ultimate heat sink, or whether it applies to

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1 a broader set of dams for a facility where a licensee  
2 might take credit, if you use that term, for that dam,  
3 an upstream dam, or a downstream dam, for that matter,  
4 for flooding protection for the site as part of their  
5 design basis --

6 MEMBER RAY: I believe it's the latter.  
7 I have tried to --

8 MEMBER STETKAR: But my problem is there's  
9 a lot of words in here that say for safety-related  
10 dams. Well, that second is not a safety-related dam.

11 MEMBER RAY: The part that I was just  
12 reading there does not say safety-related dam --

13 MEMBER STETKAR: Later in the Regulatory  
14 Guidance, it says safety-related dams.

15 MEMBER RAY: Well, I understand, but --

16 MR. PETTIS: Let's see. Yes, to my  
17 understanding, I don't -- I don't think -- I'm going  
18 out on a limb here -- I don't think we even have the  
19 words "safety-related" in this Reg Guide, and I think  
20 the reason for it is because most of these structures  
21 and water-control structures are not even classified  
22 as safety-related.

23 MEMBER RAY: Particularly those that  
24 protect against flooding, like -- you found it before  
25 I did.

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1 MR. PETTIS: Like I said --

2 MEMBER REMPE: Item H.

3 MEMBER RAY: -- stick my neck out.

4 MR. PETTIS: Page 13?

5 MEMBER REMPE: Item H.

6 MR. PETTIS: Oh, I've got a different  
7 pagination here.

8 MEMBER REMPE: Oh, I am -- I am -- you are  
9 right. I am looking at the pdf. Well, I think the  
10 pdf page is in -- it's the last item under --

11 MR. PETTIS: Item H, Special Provisions  
12 for Dams?

13 MEMBER REMPE: No, Post-Construction  
14 Changes, above --

15 MR. PETTIS: Right.

16 MEMBER REMPE: -- technical evaluation.

17 MR. PETTIS: Yeah.

18 MEMBER REMPE: It is page 13 in your --

19 MR. PETTIS: Okay.

20 PARTICIPANT: Technical evaluation.

21 MEMBER REMPE: Above technical  
22 evaluations.

23 PARTICIPANT: Right, Post-Construction  
24 Changes.

25 MEMBER REMPE: Yes.

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1 (Simultaneous speaking.)

2 MEMBER STETKAR: Only for safety-related,  
3 I had a separate question about that.

4 MEMBER RAY: It is probably the only place  
5 in the Reg Guide with it.

6 MR. PETTIS: It's the only place I could  
7 find.

8 MEMBER RAY: Where that word is in there,  
9 and -- .

10 MR. ORR: What are we referring to,  
11 though? That's -- that's not really dealing with the  
12 Reg Guide. It's providing some additional guidance as  
13 far as operating and maintenance features that should  
14 be examined.

15 MEMBER RAY: Where is this, Joy?

16 MEMBER REMPE: It's on page --

17 MR. PETTIS: It's C5H.

18 MEMBER REMPE: Page 13, all the way at the  
19 top.

20 MEMBER RAY: Oh, I see it, okay, excuse  
21 me.

22 MEMBER STETKAR: The question I had about  
23 that, which is -- it's all partly related to the  
24 scope, is suppose you make modifications to a non-  
25 safety-related dam that could fail and flood your

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1 site. Does that mean that you don't have to -- you  
2 don't care about that?

3 MR. LUPOLD: No, we do care about that.

4 MEMBER STETKAR: Okay. Well, I am not  
5 sure that --

6 MR. LUPOLD: Number one --

7 MEMBER STETKAR: -- licensees wouldn't --

8 MR. LUPOLD: -- those changes would  
9 actually probably not be included within an inspection  
10 procedure, and it could be.

11 Maybe it was an oversight on our part to  
12 not remove "safety-related," all right? But let me  
13 read a couple of statements about the scope of this  
14 particular Reg Guide, and I will say the Reg Guide  
15 scope was expanded.

16 Right in the purpose, on the very first  
17 page, we say the water-control structures include  
18 those used in the emergency cooling water system and  
19 those relied upon for flood protection.

20 MEMBER STETKAR: Yes.

21 MR. LUPOLD: The dam structures relied  
22 upon for flood protection falls under the scope of  
23 this Reg Guide, and that is what Mr. Pettis has  
24 stated.

25 And back in the section under C, Staff

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1 Regulatory Guidance, we state the Regulatory Guide  
2 applies to onsite and offsite water-control structures  
3 associated with emergency cooling water systems,  
4 nuclear power plants whose failure can either cause  
5 site flooding, the failure of the plant's emergency  
6 cooling system, and we say or otherwise endanger the  
7 plant. Maybe the wording would have been better  
8 stated to say "Failure of the plant's emergency  
9 system," period, and say "An offsite water-control  
10 structure that could otherwise endanger the plant."

11 MEMBER STETKAR: I --

12 MR. LUPOLD: That would have been a  
13 clearer statement.

14 MEMBER STETKAR: The --

15 MR. LUPOLD: But that is how we're  
16 interpreting that.

17 MEMBER STETKAR: As long as everyone  
18 understands that, because one interpretation of the  
19 sentence that you just quoted was that the logical  
20 restriction says "Onsite and offsite water-control  
21 structures associated with emergency cooling water  
22 systems" -- that is a necessary and sufficient --  
23 that is a necessary requirement -- and then, "whose  
24 failure" could be expanded.

25 If I don't have -- if my dam is not

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1 associated with my emergency cooling system, I don't  
2 care about it.

3 MR. LUPOLD: Well, I understand what you  
4 are saying, and I understand what the words say. I  
5 understand how the words are written. But I'm telling  
6 you how we're interpreting them.

7 MEMBER STETKAR: Okay. As long as every  
8 current licensee and every possible future licensee  
9 who might build a plant near a river or lake or  
10 something like that understands -- and all of their  
11 attorneys --

12 PARTICIPANT: And reviewers.

13 MEMBER STETKAR: -- and reviewers --

14 MR. LUPOLD: Okay, understood.

15 MEMBER STETKAR: -- would understand those  
16 words, then, you know, that is fine.

17 MR. LUPOLD: What I think I would  
18 recommend as a way forward through this particular  
19 item is when you write anything up on this, you make  
20 a recommendation that we clarify that particular  
21 sentence.

22 MEMBER RAY: Okay. What sentence are you  
23 -- I lost track.

24 MR. LUPOLD: Yeah, on page 5, in section  
25 C, the Staff Regulatory Guidance, the first paragraph

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1 under that is -- is the -- is where I read from, and  
2 it talks about -- and it can -- you're right, it could  
3 be interpreted that this is only applicable to the  
4 emergency cooling water system, but that is not the  
5 way that it was meant to be.

6 MEMBER STETKAR: But there are a few  
7 things. I mean, you have to kind of read through it  
8 from this -- I am obviously reading it from the very  
9 focused, skeptical point of view, and extracting  
10 places where -- where that kind of piques my concern.

11 There's another question, and I just have  
12 the sections here. Embankments or other appurtenance  
13 structures associated with or part of a water-control  
14 structure addressed by this Reg Guide are those  
15 typically built to provide or protect the ultimate  
16 heat sink. I mean, there are several places where  
17 this seems to be narrowly focused only on the  
18 emergency-ultimate-heat-sink-related structures.

19 CHAIRMAN BLEY: Let me suggest a little  
20 internal conversation here. We had almost verbatim  
21 the same discussion at the Subcommittee meeting. My  
22 impression was on a few of these, the Staff was going  
23 to try to clean up the language so it couldn't be  
24 misinterpreted. It's smelling like maybe -- do we  
25 want -- do you want -- do we want a letter on this,

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1 and point out these few things? Because it didn't  
2 work just to talk about them.

3 MEMBER STETKAR: It didn't work just to  
4 talk about them, and in the places where they changed  
5 the language, it -- it became -- onsite versus offsite  
6 was clarified. The ability to rely on inspections  
7 performed by other agencies was clarified. This  
8 notion of does it apply strictly to the emergency  
9 ultimate heat -- the emergency cooling ultimate heat  
10 sink protection, I think attempts were made to clarify  
11 that, but not consistently throughout the document.

12 CHAIRMAN BLEY: And there was the argument  
13 that the up-front scope maybe is controlling, but I  
14 don't know if that really works for people.

15 MEMBER RAY: Well, the sentence that we're  
16 talking about, if I can make a suggestion, is easily  
17 modified. The problem with it is simply that the  
18 phrase "associated with emergency cooling water  
19 systems" appears in the wrong place, to be simplistic  
20 about it.

21 I wrote up the letter without making that  
22 qualification, just saying that it applied to  
23 structures that either protected against flooding or  
24 were part of the emergency cooling water system,  
25 basically.

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1           The problem we are having is here that  
2 we're talking about water-control structures  
3 associated with emergency cooling water systems whose  
4 failure could cause flooding, limiting -- I know, hold  
5 on -- and that means that other structures not  
6 associated with emergency cooling water systems that  
7 could cause flooding are not covered.

8           And that is your concern. I understand  
9 that. I understood that from the beginning, and the  
10 letter as I wrote it does not make that limitation.  
11 It is structures that could either cause flooding or  
12 which are involved in the emergency cooling water  
13 system.

14           MEMBER STETKAR: And indeed --

15           MEMBER RAY: It's just an improperly  
16 stated sentence, as I saw it, and therefore, I was  
17 correcting it, was the intention.

18           Now, I don't think anybody disagrees with  
19 the proposition that it covers both. In fact, the way  
20 I had written it was an inspection monitoring program  
21 for water-control structures including those used in  
22 emergency cooling water system and those relied upon  
23 for flood reduction --

24           MEMBER STETKAR: And this is exactly what  
25 the first paragraph in the Reg Guide says. That is

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1 exactly what --

2 MEMBER RAY: That's right.

3 MEMBER STETKAR: -- but as you get into  
4 more of the elaboration and the details, you start to  
5 -- to wander away from that overarching notion.

6 MEMBER RAY: I didn't see it that way. I  
7 saw it as simply an incorrect statement of the  
8 purpose, which I was then correcting. And --

9 MEMBER STETKAR: Okay.

10 MEMBER RAY: -- so the way it is written  
11 is wrong. We ought to stipulate to that. And the way  
12 it is stated earlier is right, and that is the way I  
13 was trying to get it --

14 MEMBER STETKAR: Yes, the way it is stated  
15 in the introduction is the way I was trying to --

16 MEMBER RAY: Yes.

17 MEMBER STETKAR: -- to understand it.

18 MEMBER RAY: To me, this is just a wording  
19 screw-up --

20 MEMBER STETKAR: And that's what I was  
21 trying to understand, whether there was something more  
22 subtle, as I was bringing up --

23 MEMBER RAY: I never thought about that,  
24 John, frankly. I just assumed that --

25 MEMBER STETKAR: Because I am reading it

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1 from the perspective of a licensee who, you know,  
2 brings out the lawyers, and says I am not, you know,  
3 I don't need to inspect that dam because it doesn't  
4 satisfy the logical "and" relationships that are  
5 stated in this guidance.

6 MEMBER RAY: Well, of course, I see  
7 guidance a little differently than you do maybe, which  
8 is I don't see lawyers getting involved in regulatory  
9 guidance anyway. It is something that you adopt or  
10 you don't, and if you don't, you propose something  
11 else, and it's either acceptable or it's not.

12 But nevertheless --

13 MEMBER STETKAR: Okay.

14 MEMBER RAY: -- you are exactly right,  
15 this statement here is -- needs to be fixed.

16 MEMBER STETKAR: Okay.

17 MEMBER RAY: Sorry about that.

18 CHAIRMAN BLEY: And I thought that's the  
19 way we left the Subcommittee meeting --

20 PARTICIPANT: I thought that's the way you  
21 left the Subcommittee meeting. That's why I --

22 MEMBER RAY: But I didn't see this until  
23 yesterday, okay? So now I'm kind of speaking -- all  
24 right -- kind of speaking to the Staff.

25 MEMBER RAY: Okay, proceed.

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1 MR. PETTIS: Slide seven? This is some  
2 more background on Rev. 2, issued for popular comment.  
3 One set of comments received. Those are the ones that  
4 we have the comment resolution document for. There  
5 were a total of about 18 or so comments. And we  
6 responded internally to those, and those have been  
7 revised as a result of our last meeting in November,  
8 and they hopefully align themselves with some of the  
9 comments that the Members had.

10 MEMBER RAY: Tim, do you fully understand  
11 what we just talked about in that one sentence and how  
12 it needs to be fixed?

13 MEMBER STETKAR: It's perhaps more than --

14 MR. LUPOLD: Yes.

15 MEMBER RAY: Okay.

16 MEMBER STETKAR: -- one sentence, but that  
17 one sentence is the best illustration of it.

18 MEMBER RAY: All right. We will be here  
19 tomorrow. You may consider whether or not some  
20 further editorial modification is in order, or we can  
21 write it down in a letter and send it to you, whatever  
22 you want.

23 MR. LUPOLD: A letter seems like a  
24 sledgehammer when we might not need one.

25 MEMBER RAY: So let's just proceed, but I

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1 just want to make that point.

2 MR. LUPOLD: All right.

3 MR. PETTIS: Those comments, as  
4 applicable, were incorporated into the Reg Guide, and  
5 out of the 18 or so comments, we basically responded  
6 to about four of those that seemed applicable to the  
7 Reg Guide. So the Reg Guide incorporates comments 7,  
8 8, 9, and 14 that came from that list of 18 comments  
9 from industry.

10 I am just trying to be specific and  
11 delineate for the Committee exactly what it was that  
12 we looked at, what it was that we commented on, and  
13 how we incorporated those comments into the Reg Guide.

14 The next slide, which is slide eight, has  
15 about six bullets: one, two, three, four, five or six  
16 bullets.

17 This slide represents some of the comments  
18 from the Members back in the last meeting. So this is  
19 an attempt to try to catalog what some of the  
20 discussions were, what some of the issues were, and I  
21 put them on the slide because they've been  
22 incorporated. If you'd like, I can tell you exactly  
23 where they are. Yes?

24 MEMBER STETKAR: The third bullet, do me  
25 a favor. When -- look at -- look at that, and I'm

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1 glad you added the paragraph --

2 MR. PETTIS: Page 8, third bullet, or 7?

3 MEMBER STETKAR: It's -- well, page 8 of  
4 your thing, but it's page 6 of the Reg Guide, or  
5 section Inspection --

6 MR. PETTIS: Under this slide?

7 MEMBER STETKAR: Yes, this slide.

8 MR. PETTIS: Right, okay, that's page 8.  
9 You're talking third bullet on this one?

10 MEMBER STETKAR: Yes sir.

11 MR. PETTIS: Okay.

12 MEMBER STETKAR: You did add the paragraph  
13 that -- that elaborated on the inspection for plants  
14 that have aggressive groundwater --

15 MR. PETTIS: Yes.

16 MEMBER STETKAR: -- conditions. The  
17 description of what is non-aggressive is not logically  
18 consistent with what is aggressive. Aggressive has an  
19 "or" logic, and it specifically says "pH less than  
20 5.5, chlorides greater than 500 PPM or sulfates  
21 greater than 1500" --

22 MR. PETTIS: Right, it's the non-  
23 aggressive.

24 MEMBER STETKAR: I am sorry, for plants  
25 with aggressive groundwater, I will now quote for the

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1 record.

2 "For plants with aggressive  
3 groundwater/soil (pH less than 5.5, chlorides greater  
4 than 500 PPM, or sulfates greater than 1500 PPM), a  
5 program should be implemented to manage concrete  
6 aging."

7 So aggressive means any one of those  
8 criteria being satisfied. The preceding paragraph  
9 says "For plants with non-aggressive raw water and  
10 groundwater/soil (pH greater than 5.5, chlorides less  
11 than 500 parts per million (PPM), or sulfates less  
12 than 1500 PPM)."

13 Those descriptions of aggressive and non-  
14 aggressive are not logically consistent. To have non-  
15 aggressive, you need an "and" logic. All three of  
16 those conditions must be satisfied if indeed the  
17 aggressive is an "or" logic.

18 PARTICIPANT: Or vice versa.

19 MEMBER STETKAR: Or vice versa. As -- as  
20 written, it's not -- I don't know what is aggressive,  
21 and I don't know. I don't know water chemistry. Is  
22 aggressive -- does it require all three of those  
23 conditions to be satisfied: low pH and high chlorides  
24 and high sulfates? Or does it require only any one of  
25 them?

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1 CHAIRMAN BLEY: I remember at the  
2 Subcommittee meeting, you were going to go -- the  
3 Staff was going to go check it, and --

4 MR. PETTIS: We did.

5 CHAIRMAN BLEY: -- and make the language  
6 correct, then.

7 MR. PETTIS: We did.

8 MEMBER STETKAR: Well, they added the  
9 paragraph for aggressive. They didn't have any -- any  
10 inspection for aggressive conditions.

11 CHAIRMAN BLEY: About the logic problem.

12 MR. PETTIS: Right, there was a takeaway  
13 at the last meeting. The two parts, like you said, we  
14 added the aggressive.

15 MEMBER STETKAR: You did?

16 MR. PETTIS: And then there was a question  
17 with respect to the "or" or the "and/or," and the  
18 takeaway was to, you know, go back and take a look.

19 MEMBER STETKAR: And when you added --

20 MR. PETTIS: I did go back and take a  
21 look. This -- this language is basically in the new  
22 revision of GALL for license renewal, so I'd preface  
23 this --

24 MEMBER STETKAR: But what did you say?

25 MR. PETTIS: And or or --

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1 MEMBER STETKAR: The two are not  
2 consistent.

3 MR. PETTIS: And it's or. It's or, and --

4 CHAIRMAN BLEY: Any one of them makes it  
5 aggressive.

6 MEMBER STETKAR: No, non-aggressive.

7 MR. PETTIS: No, no, the non-aggressive.

8 CHAIRMAN BLEY: Any one of the three makes  
9 it aggressive. Therefore, in the previous paragraph,  
10 it should be an "and."

11 MEMBER STETKAR: To me, but that's just  
12 me.

13 MR. PETTIS: Well rather than change what  
14 was in the GALL Report, I just went back to verify, so  
15 --

16 MEMBER STETKAR: Well, just because --  
17 just because, you know, my brother used to play with  
18 broken glass doesn't mean I have to. It actually says  
19 that in the GALL Report?

20 MR. PETTIS: And the revision, and the new  
21 revision.

22 (Simultaneous speaking.)

23 MEMBER BROWN: -- for the non-aggressive?

24 MR. PETTIS: For the -- for the non-  
25 aggressive.

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1 MEMBER BROWN: Any one of those makes it  
2 non-aggressive? That doesn't make any sense.

3 MR. PETTIS: No, it does not.

4 (Simultaneous speaking.)

5 MEMBER POWERS: I mean understand that  
6 aggressive is driven by pH because you dissolve the  
7 calcium hydroxide, so that means low pH makes it  
8 aggressive.

9 Okay. Aggressive is driven by sulfate  
10 because you precipitate out gypsum. It causes  
11 expansion and spallation, okay? So high sulfate makes  
12 something aggressive.

13 MEMBER STETKAR: Even if you have high pH.

14 MEMBER POWERS: Even if you have high pH.  
15 Okay, so any one of those things can do -- chloride,  
16 makes it aggressive because it increases the  
17 solubility of calcium, okay, whether you have --

18 MEMBER STETKAR: Now --

19 MEMBER POWERS: That one, you can combat  
20 by having high pH. But nevertheless, with chloride,  
21 it becomes more soluble regardless of the pH. It's  
22 just not very important at high pH. But sulfate works  
23 all the time because, I mean, it's the classic  
24 driveway when you put sulfates on it because you  
25 precipitate out gypsum.

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1 MEMBER RAY: Okay, so non-aggressive has  
2 to be "and."

3 MEMBER POWERS: You have to have all those  
4 things --

5 MEMBER RAY: That's right.

6 MEMBER POWERS: -- to be non-aggressive.

7 MEMBER RAY: Okay.

8 MR. LUPOLD: We will agree with that, and  
9 we'll go ahead and change that, and we'll actually go  
10 back and check the GALL --

11 MEMBER RAY: Yeah, I was going to say --

12 MR. LUPOLD: We will alert the Division  
13 for License Renewal that they can correct that.

14 MEMBER STETKAR: The reason I was looking  
15 at Dick Skillman is we have a Subcommittee meeting  
16 coming up on GALL for subsequent license removal here  
17 in the near future, so it is something we ought to  
18 look at.

19 MEMBER SKILLMAN: It's getting smaller and  
20 smaller. It's dissolving.

21 (Laughter.)

22 MEMBER RAY: Good job, John. I -- I  
23 missed that one. The other one, I got.

24 MEMBER STETKAR: In the Subcommittee  
25 meeting, I brought up the logical "or" because it

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1 wasn't clear to me -- for non-aggressive, because it  
2 wasn't clear to me why the logical "or" applied, and  
3 I noted that there was no guidance for aggressive.  
4 And they indeed, yes, said yeah, you're right, we  
5 should have guidance for aggressive, which they added.  
6 It is fine. It is great, the guidance for aggressive.

7           And indeed, the description of -- in that  
8 paragraph, that now addresses guidance for aggressive  
9 conditions, the description of what are aggressive  
10 conditions was consistent with my understanding. It  
11 is just that the -- the preceding paragraph, the logic  
12 did not get changed. That is interesting.  
13 Interesting in GALL. I was going to look up GALL now.

14           MEMBER RAY: Okay, let's resume.

15           MR. PETTIS: Okay. Back to slide -- back  
16 to slide eight.

17           So again, these are the bullets that  
18 represented the takeaways that we took away from the  
19 November meeting that had to do with Member comments,  
20 and tried to incorporate those as we could into the  
21 Reg Guide.

22           The applicability was revised, which we --  
23 we just discussed. The title change was more  
24 reflective -- or more accurately reflects the scope  
25 that's in the Reg Guide. The aggressive water

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1 environment that we -- that we spoke about.

2 The consideration for remote monitoring  
3 instrumentation, we had -- we had removed that in the  
4 original version, and basically commented internally  
5 that -- that we didn't -- we didn't think it was -- it  
6 was necessary.

7 Based on the comments received, we went  
8 back, took another look at it, and modified it  
9 somewhat, modified the language a little bit, but we  
10 put it back in.

11 And again, it is a Reg Guide, so if  
12 someone wants to propose something -- something  
13 different, they can -- they can feel free to do that.

14 The last one had to do with this -- this  
15 term "significance." We were trying to make it a  
16 little less specific, I guess. We did not want to  
17 specify what -- what constituted the threshold for  
18 significance, so the collective wisdom was to, again,  
19 tie it back to the licensee, use the word  
20 "importance," and as an example, we put in the Reg  
21 Guide an earthquake that meets or exceeds design basis  
22 for a structure or component, just to kind of give  
23 some sense as to what we might consider to be  
24 important.

25 MEMBER BROWN: Is that an operating basis

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1 earthquake, a safe shutdown earthquake, or a design  
2 basis?

3 MR. PETTIS: We --

4 MEMBER BROWN: This says design basis,  
5 which --

6 MR. PETTIS: This says design basis,  
7 right.

8 MEMBER BROWN: -- means that's a licensing  
9 basis earthquake, then?

10 MR. PETTIS: Well, some -- some plants  
11 that are out there probably do not even -- do not even  
12 have -- some of the older plants are probably going to  
13 have a different design basis with respect to, you  
14 know, OBE, SSE, and what have you, so we just used the  
15 term "design basis," whatever that plant's design  
16 basis, without being specific.

17 MEMBER RAY: Well Charlie, the way I read  
18 it was this is merely an example --

19 MR. PETTIS: That's an example.

20 MEMBER RAY: -- the word "important" is  
21 more --

22 MEMBER BROWN: I agree with that.

23 MEMBER RAY: -- significant.

24 MEMBER BROWN: Yes, I did not disagree  
25 with that.

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1           MEMBER RAY:    To use the word that is  
2 prohibited here.  I don't like it as an example.  I  
3 would rather something else.  But it is hard to pick  
4 something else because like he says, not every plant  
5 has an operating basis for structures like this.

6           MR. PETTIS:  Well, especially the Part 52  
7 plants that basically, you know, are new plants.

8           MEMBER RAY:  Or structures that aren't  
9 part of the -- of plant design.

10          MR. PETTIS:  It is always difficult in  
11 putting some words together because, you know, you  
12 can't encompass everything which you'd like --

13          MEMBER RAY:  As long as it's an example,  
14 I find it to be okay, personally.

15          MR. PETTIS:  Well that is why we, you  
16 know, just flagged it as an example, you know, by  
17 putting "Example: an earthquake that meets or exceeds  
18 its design basis."

19          MEMBER STETKAR:  I was looking for  
20 something else.  If -- but if I don't -- if I have an  
21 earthquake -- and I apologize, I wasn't listening, I  
22 was searching GALL -- if I have an earthquake that  
23 does not meet or exceed the design basis, that means  
24 I don't need to inspect the structure?

25          MR. PETTIS:  That means you as a licensee

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1 make that call internally.

2 MEMBER RAY: You decide whether it's  
3 important or not is the way I see it. This is simply  
4 an example of what is important, but that is not the  
5 only measure of importance.

6 MR. PETTIS: I mean, just like we didn't  
7 want to quantify the word "significance," we maybe  
8 broke that mold in providing some guidance for the  
9 word "importance," but again, we were just trying to  
10 give some threshold for consideration as to what is  
11 important.

12 And again, you know, the licensees job is  
13 to sit down, look at the data, and consider those  
14 structures to be fully compliant.

15 And that is all we have on that -- on the  
16 slide presentation. Are you interested in going over  
17 the public comments?

18 MEMBER RAY: I think yes, if you can do --

19 MR. PETTIS: Because I can --

20 MEMBER RAY: -- 10 minutes or so --

21 MR. PETTIS: Yes.

22 MEMBER RAY: -- on that, that would be --

23 MR. PETTIS: Yes. I am not going to go  
24 over all of them. Just the ones that --

25 MEMBER RAY: These were looked at

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1 carefully at the Subcommittee level, and so I just  
2 think any highlights that you think should be part of  
3 this record.

4 MR. PETTIS: Yes. Okay.

5 Yes, the attempt was to try to see which  
6 ones would be applicable to incorporating into the Reg  
7 Guide. Excuse me. I am not sure if -- maybe I need  
8 this closer.

9 But like the -- like one of the previous  
10 slides stated, we basically went back and incorporated  
11 the -- the comments that were in comments 7, 8, 9, and  
12 14.

13 The previous copy of these comments that  
14 were given to the Committee back in November didn't  
15 have any numbering scheme associated with them. These  
16 were just raw comments that came in. So we decided to  
17 put some numbers on them, so that's why, in this  
18 comment, you see little blue numbers in the left-hand  
19 corner that say comment number 1, comment number 2, so  
20 at least this way, we can intelligently talk about  
21 what was incorporated and what wasn't.

22 On page 6 is comment 7. Page 6 is comment  
23 7, which had to do with the remote monitoring, and  
24 then again, we provided in the NRC resolution a little  
25 longer discussion as to what we were going to put in

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1 the Reg Guide. That was put in on that paragraph --

2 MEMBER RAY: Don't have that document that  
3 you're referring to.

4 MEMBER BROWN: Yeah, we do.

5 MEMBER REMPE: We've got it  
6 electronically.

7 MEMBER RAY: Oh.

8 MEMBER BROWN: We did.

9 PARTICIPANT: Oh, you do have it?

10 MEMBER RAY: Paging through the paperwork  
11 here, and --

12 MEMBER BROWN: No, we did not get it as a  
13 handout. I just happened to print it out. I printed  
14 out those --

15 MEMBER RAY: Oh, okay.

16 MEMBER BROWN: -- pages --

17 MEMBER RAY: Okay, so --

18 MR. PETTIS: Okay, so --

19 MEMBER RAY: So the Committee does not  
20 have --

21 MR. PETTIS: There's no hard copies.

22 MEMBER RAY: No hard copies.

23 MR. PETTIS: Oh, okay.

24 MEMBER RAY: So if you can just try and  
25 summarize --

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1 MR. PETTIS: Okay.

2 MEMBER RAY: -- overall.

3 MR. PETTIS: Well again, we got four  
4 comments that we incorporated into the Reg Guide. We  
5 have the one on the remote monitoring, which is this  
6 comment number 7, which happens to correlate to one of  
7 the ACRS Member type comments, which I call comment 6.  
8 It's the bullet that's on that page.

9 Comment 8, public comment 8 talked about  
10 this significance and the word "significance," and we  
11 had polished that up, and went to the word  
12 "importance," and put that on page 13.

13 We have public comment 9, which again  
14 talks about that similar type of comment.

15 MEMBER BROWN: Well, you --

16 MR. PETTIS: We went --

17 MEMBER BROWN: Let me go backwards. On 8,  
18 just since nobody has a copy of it, yeah, you changed  
19 or deleted the word "significant," but you tied --  
20 this was where, when findings of an engineering data  
21 review or an inspection of the monitoring program  
22 indicate that changes outside the normal expected  
23 variations occur, and you all changed the word -- used  
24 the wording "based on changes." You -- you expanded  
25 it or clarified it to make sure you didn't -- so that

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1 "based on changes" wasn't quote "tied up in the  
2 significance" --

3 MR. PETTIS: Right.

4 MEMBER BROWN: -- that's -- so again, it  
5 was a different way of approaching the use of the word  
6 "significant" as opposed to -- I am looking, I don't  
7 think you used the word "important" there, but you --

8 MR. PETTIS: No, not in that one.

9 MEMBER BROWN: -- said "based on changes"  
10 as opposed to --

11 MR. PETTIS: Correct.

12 MEMBER BROWN: -- the word "important," so  
13 that's -- that looked reasonable, so I didn't raise  
14 any objections to that. It is kind of hard to know  
15 what they're talking about --

16 MEMBER RAY: All right, well listen --

17 MEMBER BROWN: -- when you don't have --

18 MEMBER RAY: -- it seems to me that there  
19 is some further work needed. I will -- and it's  
20 relatively minor as regards what your intent is. I  
21 don't think there is any issue about what your intent  
22 is, that I can tell, anyway.

23 But we don't try and be in a position, if  
24 necessary, to reflect that -- those things we've  
25 talked about here that need further change in a

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1 letter, but we can possibly, depending on how the  
2 Committee feels about it, avoid doing so if you can  
3 tell us what further changes you would be making, and  
4 we would have to do that tomorrow. And Teresia will  
5 let you know when, okay? Tim, is that right?

6 MR. LUPOLD: That is fine, satisfactory.

7 MEMBER RAY: Okay. So I hope you have  
8 taken good notes.

9 With that, I don't think, Chairman, there  
10 is any more value in our drawing on this further,  
11 unless there are other questions or comments that the  
12 Members might have.

13 CHAIRMAN BLEY: I think not. I think even  
14 tomorrow maybe, you and John could meet with them, and  
15 that would probably suffice --

16 MEMBER RAY: Okay.

17 CHAIRMAN BLEY: -- for the Committee.  
18 We'll talk about it later.

19 Can we get the phone line open?

20 MR. PETTIS: Yes, please.

21 CHAIRMAN BLEY: And there is nobody here  
22 to invite in the room to make a comment, so we will  
23 wait for the phone line.

24 MEMBER RAY: So yeah, we will probably  
25 seek to meet with you at a mutually convenient time

**NEAL R. GROSS**

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WASHINGTON, D.C. 20005-3701

1 early tomorrow. We'll -- we can get John and myself  
2 and Teresia, anybody else who wants to, and see what  
3 changes you would like to make, and then decide, okay,  
4 that is sufficient or not. But we want to do it  
5 tomorrow, but earlier rather than later.

6 MR. PETTIS: Okay.

7 MEMBER RAY: Okay?

8 MR. PETTIS: Very good.

9 MEMBER RAY: Is the phone line open?

10 MR. PETTIS: Yes.

11 MEMBER RAY: Thank you. Anyone on the  
12 phone line, if there is anyone on the phone line, we  
13 would welcome your acknowledgment, please, and let us  
14 know that you are there, whether you have a comment or  
15 not.

16 (No audible response.)

17 MEMBER RAY: I do hear the phone line  
18 appears to be open, but no comment from any member of  
19 the public, so with that, we'll close the line. I  
20 will turn it back to the Chairman.

21 CHAIRMAN BLEY: Thank you. I guess we are  
22 finished with this. Our next item would be read-  
23 throughs of the letter. We told people it would be  
24 4:00. I don't know if there is a way to get to the  
25 Staff.

**NEAL R. GROSS**

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1 PARTICIPANT: I just talked with Chris --

2 CHAIRMAN BLEY: Yeah.

3 PARTICIPANT: -- it's ready to go.

4 CHAIRMAN BLEY: Okay. Doesn't the Staff  
5 want to be here for reading through it?

6 PARTICIPANT: I don't know.

7 CHAIRMAN BLEY: See if you can get Paul  
8 over here. Paul was wanting to come. And we'll take  
9 at least a 15-minute recess. We're off the record for  
10 the week. Aren't we? No, no, just for the day.

11 (Whereupon, the above-entitled matter went  
12 off the record at 3:01 p.m.)

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**U.S. NRC**

UNITED STATES NUCLEAR REGULATORY COMMISSION

*Protecting People and the Environment*

# Recent 10 CFR 50.46c Rulemaking Activities

ACRS Full Committee  
February 2016

Jessica Kratchman  
Division of Policy and Rulemaking  
Nuclear Reactor Regulation

# Agenda

- Rulemaking status update
- Recent changes to 50.46c ECCS Performance Requirements
- Recent changes to 50.46c Risk-Informed Options for Long Term Core Cooling.

# Recent Activities

- Implementation Template Workshop Public Meeting
  - January 19, 2016
- Concurrence activities have continued since last ACRS interaction, including the completion
  - OGC NLO, division and inter-office level concurrences.
- Next steps: EDO concurrence and submission to the Commission



**U.S. NRC**

UNITED STATES NUCLEAR REGULATORY COMMISSION

*Protecting People and the Environment*

# Recent Changes to 50.46c ECCS Performance Requirements

ACRS Full Committee  
February 2016

Paul M. Clifford  
Division of Safety Systems  
Nuclear Reactor Regulation



# Goal

Describe Changes to “Deterministic” Rule Language

# Editorial Changes

- Dozens of editorial changes
- No impact on performance requirements

(iii) A description of, and basis for acceptability of, the evaluations conducted to demonstrate compliance with paragraphs (e)(1)(i) and ~~(e)(1)(ii)~~ of this section; and

# Paragraph (m)(1) Reporting

- Last minute changes based on public workshop/webinar to resolve industry concerns
- Final rule language and SOC revised to clarify flexibility with respect to defining scope and schedule for reanalysis

(1) *ECCS evaluation model: reporting.*

(i) If an entity identifies any change to, or error in, an ECCS evaluation model or the application of such a model that does not result in any predicted response that exceeds any of the acceptance criteria specified in this section and is itself not significant as defined in paragraph (n) of this section, then the entity must prepare a report describing each such change or error, its estimated effect on predicted response, and ~~a demonstration~~the basis for the entity's determination that the error ~~or~~ change is not significant. The entity must be submittedsubmit the report to the NRC ~~no later than 12 months after the change or discovery of the error~~at least annually. |

(ii) If an entity identifies any change to, or error in, an ECCS evaluation model, or the application of such a model, that does not result in any predicted response that exceeds any of the acceptance criteria but is significant as defined in paragraph (n) of this section, then the entity must prepare a report describing each such change or error, its estimated effect on predicted response, proposed corrective actions, a proposed scope and ~~a~~ schedule for providing a reanalysis and ~~implementation of~~implementing the corrective actions. The entity must be submittedsubmit the report to the NRC within 60 days of the change or discovery of the error.

# Paragraph (n) Significant

- Last minute change to definition of significant change or error with respect to calculated ECR
  - Based on public comment

(ii) ~~Integral~~A calculated integral time at temperature different by more than 1.0-4 percent ECR from the oxidation calculated for the limiting transient using the last acceptable evaluation model, or is a cumulation of changes and errors such that the sum of the absolute magnitudes of the respective oxidation changes is greater than 1.0-4 percent ECR.

# Conclusions

- With or without 50.46c, research findings must be incorporated into plant licensing bases to ensure adequate protection
- ECCS safety assessment supports NRC decision to pursue rulemaking, along with a flexible and efficient implementation plan
- Staff has conducted a series of public workshops and webinars to encourage stakeholder involvement
- Many changes incorporated into SOC, rule language, and guidance to improve clarity, expand flexibility, and reduce burden
- Staff requests that ACRS provide a written endorsement of the 50.46c rule package



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# 50.46c Risk-Informed Alternative for Long-Term Core Cooling

Advisory Committee on Reactor Safeguards  
February 4, 2016

Steve Laur, CJ Fong  
Division of Risk Assessment  
Office of Nuclear Reactor Regulation

# Objectives

1. Identify two changes to risk-informed option
2. Explain rationale for changes

## **Issue raised via non-concurrence process:**

Should the risk-informed option allow:

- An *intentional* design change that would introduce problematic debris sources to an existing reactor?
- Intentional use of problematic debris sources in a *new reactor*?
- Entered into NRC's non-concurrence program in September 2015
- Consensus language developed by working group and approved by steering committee

# Regulatory Considerations

## **RG 1.174 states:**

“For those cases in which risk increases are proposed, the benefits should be described and should be commensurate with the proposed risk increases.”

- For existing reactors, the Commission has already identified those benefits (e.g., reduced dose) in various communications with the staff (e.g., SRM-SECY-12-0093) and has indicated that they are commensurate with the proposed risk increase by directing the staff to permit a risk-informed option.

## **Regulatory Considerations (cont.)**

- For new reactors or for an existing reactor wishing to introduce problematic debris sources where none previously existed, the benefit would not be the same (as no occupational dose would be averted)
- Therefore, under these circumstances, the onus is on the entity seeking to use the risk-informed alternative to identify the benefits and demonstrate that they are commensurate with the proposed risk increase (consistent w/ RG 1.174)

# Revised rule language

*(e) Alternate risk-informed approach for addressing the effects of debris on long-term core cooling.*

*(1) Attributes of an acceptable risk-informed approach.*

An entity may request that the NRC approve a risk-informed approach for addressing the effects of debris on long-term core cooling to demonstrate compliance with the requirements in paragraph (d)(2)(iii) of this section. **An entity may request to use the alternate risk-informed approach for design modifications or new reactor designs that introduce debris sources only if the entity demonstrates there is a significant safety or security issue that cannot be practicably addressed by other means.**

## Issue #2: changing methods

- Issue: after successful adoption of 50.46c(e), should all method changes require NRC approval?
  - Discussed during December 2015 ACRS meeting
  - Staff committed to re-examination of rule language

# Regulatory Considerations

- Intent of language was to prevent erosion of safety by use of un-vetted methods
- Intent of language was not to require NRC approval for very minor changes or changes from one approved method to another (e.g., multiple greek letter → alpha factor)

# Regulatory Considerations

- Not practical to define all methods that are / are not acceptable a priori
- Instead, staff will impose a license condition indicating which methods cannot be changed without NRC approval (case-by-case approach)
- Consistent with recent risk-informed LARs (e.g., 50.69)

# Revised Rule Language

(m)(8) Risk-informed consideration of debris: updates.

(i) Each licensee shall update its risk informed evaluations under paragraph (e)(1) of this section no later than 48 months after initial NRC approval or the latest update. However, this requirement does not apply to holders of combined licenses before initial loading of fuel under § 52.103(g) of this chapter, or to design certification rules.

~~Each licensee that desires to change the methods or approaches employed in the NRC approved risk-informed evaluation of debris shall submit an amendment to its operating license under 10 CFR 50.90 through 50.92. The amendment should describe any changes the licensee wishes to make to the analyses, evaluations, and modeling (including the PRA and its supporting analyses).~~

# Revised Rule Language (cont)

(e)(3) The NRC's approval must specify the ~~circumstances under which the licensee or applicant, as applicable, shall notify the NRC of changes or errors in the risk evaluation approach utilized to address the effects of debris on long term cooling~~ types of changes to the risk-informed analyses, evaluations and modeling (including the PRA and its supporting analyses) for which NRC approval must be requested in the form of a license amendment under 10 CFR 50.90 through 50.92, (including any necessary requests for departures or exemptions from a referenced standard design certification under 10 CFR part 52, if applicable), or in the form of a request to amend a standard design certification rule under 10 CFR part 2, subpart H, as applicable.

# Recap / Questions?

- Two changes were made to rule:
  - Additional justification required to use risk-informed option for new reactor or to intentionally introduce problematic debris to existing reactor
  - Clarified that not all changes will require NRC approval

# 10CFR50.46c Rulemaking

**Gordon Clefton**

Sr. Project Manager, NEI

Full ACRS Committee Meeting

Rockville, Md., USA: February 4, 2016

# NEI Perspective

## 10CFR50.46c compliance will be a substantial consumption of resources

- NEI Petition for Rulemaking submitted in 2000
  - 46c compliance projected to be complete 2022-2023
- Programs now improving efficiency:
  - NEI 'Cumulative Effects of Regulation Project'
  - NRC 'Project AIM 2020'
  - NEI 'Delivering the Nuclear Promise'

# NEI Perspective

## §50.46c Implementation Proposal

- Suggest a Conditional Compliance
  - No Fixed Date for § 50.46c Compliance is Required
- Switch to § 50.46c
  - If a Plant Makes a Change Requiring a New Evaluation Model (EM)
  - If Thermal Conductivity Degradation or Other Changes/Errors Affect PCT Requiring a New EM
- Conditional Compliance Allows Maintaining:
  - Compliance with Existing § 50.46
  - Significant Margins-of-Safety Under Current Acceptance Criteria

# Questions?



**Peach Bottom Atomic Power Station  
Units 2 and 3**

**MELLLA+**

**Maximum Extended Load Line Limit Analysis Plus**

**Advisory Committee on Reactor Safeguards**

**Power Uprate Full Committee Meeting**

**February 4, 2016**



**Exelon Generation®**

# Introductions

**Kevin Borton**  
**Licensing Manager, Power Uprates**



**Exelon** Generation®

# Licensee Presenters

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- Jim Armstrong      Reg Assurance Manager      Exelon/PBAPS
- Kevin Borton      Sr. Manager, Licensing      Exelon/PUR
- Andy Olson      Sr. Staff Engineer, Fuels      Exelon /Corp
- David Turek      Sr. Manager Operations      Exelon/PBAPS

# Licensee Support

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- Steven Minnick      Project Manager      Exelon/PUR
- James Tusar      Nuclear Fuels Mgr.      Exelon /Corp
- David Neff      Licensing      Exelon /Corp
- Alex Psaros      Reactor Eng. Mgr.      Exelon/PBAPS
- John McClintock      Operations Training      Exelon/PBAPS
- Tony Hightower      Former Project Ops      Exelon/PUR
- Rudy Tyler      Simulator Coordinator      Exelon/PBAPS
  
- Bruce Hagemeyer      MELLLA+ Project Manager      GEH
- Shawn Lamb      GEH Technical Leader      GEH
- Mike Cook      GEH Technical Leader      GEH

# Agenda

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- PBAPS Station History / Overview Jim Armstrong
- MELLLA+ Project Overview Kevin Borton
- MELLLA+ Design and Analyses Andy Olson
- Operator Actions and Training Dave Turek

# **PBAPS Station Overview**

**Jim Armstrong**  
**Regulatory Assurance Manager**



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# Station Overview

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- General Electric BWR-4, Mark I Containment
- Containment design pressure 56 psig
- Began commercial operation in 1974, OLTP 3293 MWt
- EPU 3951 MWt implemented U2 2014, and U3 2015
  - Enriched Boron – improves Standby Liquid Control system margin for ATWS
  - Elimination of CAP Credit
- 24 month operating cycle
- GNF2 full core
- Steam-driven feedwater pumps
- Licensed for Increased Core Flow (ICF) (110%)

# PBAPS History

Key Milestones	Year	MWth
➤ Full Power Operating License (Original Licensed Thermal Power - OLTP)	1973 (U2)	3293
	1974 (U3)	3293
➤ Stretch Power Uprate (105% OLTP)	1994 (U2)	3458
	1995 (U3)	3458
➤ MUR Uprate (1.62% increase)	2002 (U2)	3514
	2002 (U3)	3514
➤ MELLLA Operating Domain	1995	N/A
➤ Renewed Operating License	2003	N/A
➤ Option III Stability Solution	2005	N/A
➤ GNF2 Fuel Introduction	2010	N/A
➤ Extended Power Uprate (120% OLTP)	2014 (U2)	3951
	2015 (U3)	3951

# MELLLA+ Project Overview

**Kevin Borton**



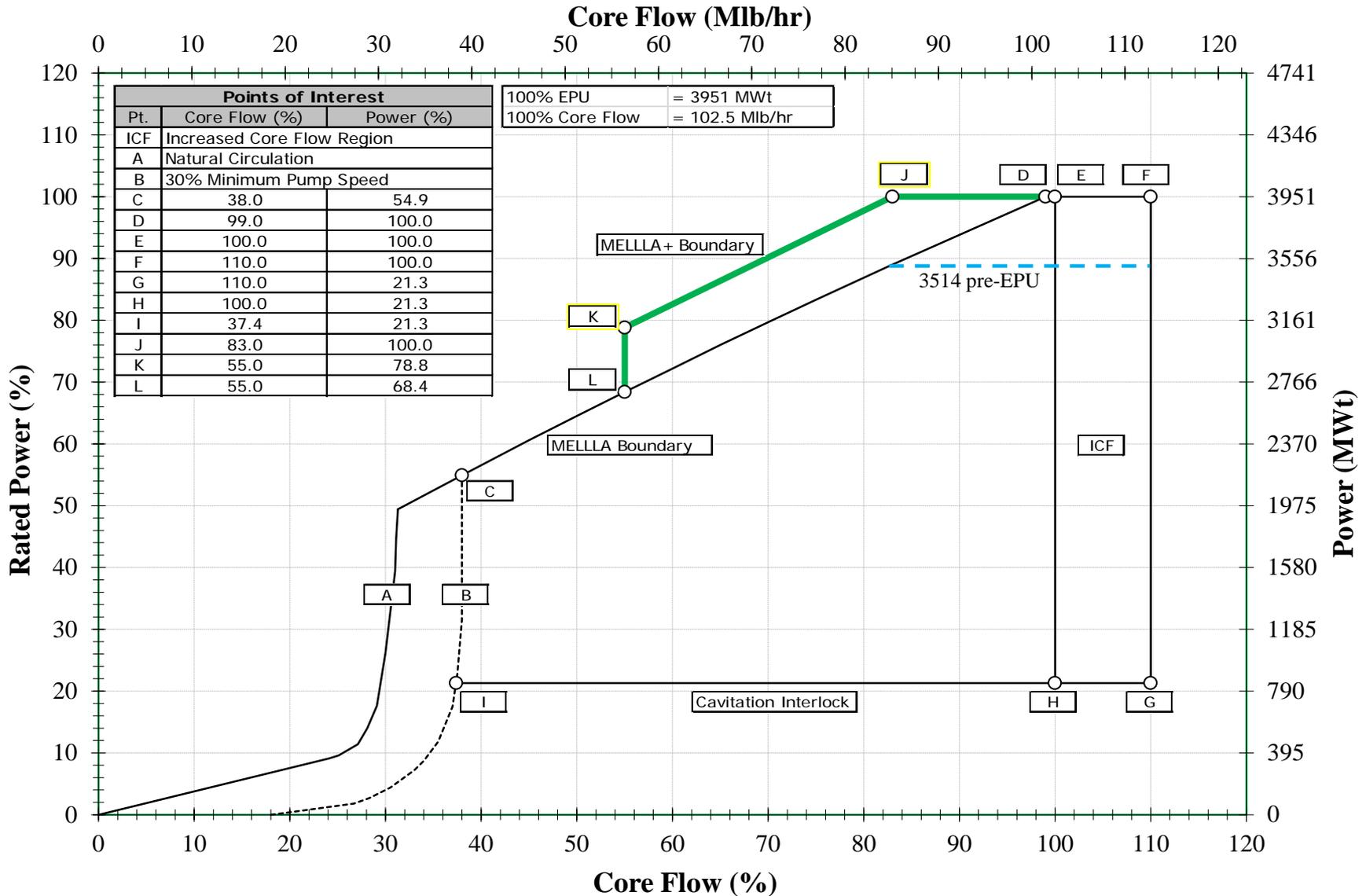
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# MELLLA+ Benefits

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- Expands nominal core flow window at 100% EPU power by 16% of rated flow
  - Fewer control rod manipulations
  - Reduction in End-of-Cycle down-powers
- Detect and Suppress Solution - Confirmation Density (DSS-CD) provides improved core instability detection algorithm
- Will increase the station capacity factor during the operating cycle

# MELLLA+ Power-to-Flow Map



# MELLLA+ Project Scope

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- MELLLA+ does not change:
  - Operating Pressure
  - Maximum Licensed Thermal Power
  - Maximum Licensed Core Flow
  - Feedwater Flow Rate or Temperature
- MELLLA+ does not require modifications to balance of plant equipment

# MELLLA+ Implementation Plan

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- **Phase 1 – Outage Related Plant Modifications (Prior to MELLLA+ Approval)**
  - DSS-CD Installation (Complete)
    - Units 2 and 3 have operated with Option III since 2005
    - DSS-CD Firmware Installed and Functionally Tested on Unit 2 and Unit 3
    - Unit 2 and Unit 3 CDA RPS Trip Bypassed until MELLLA+ Approval / Implementation
- **Phase 2 – On-line Installation / Testing (After MELLLA+ Approval)**
  - MELLLA+ Technical Specifications Implementation
  - MELLLA+ Modification Implementation
  - Enable DSS-CD APRM/OPRM Settings
    - Remove Bypasses and Test
  - MELLLA+ Reload Analysis Updated
    - 3D Monicore Databank
    - COLR
  - Procedure Revisions
  - Perform MELLLA+ Operational Testing

# MELLLA+ Design and Analyses

**Andy Olson**



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# EPU Operating Experience

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- For EPU power the maximum licensed core flow is **110 %**
  - 104% core flow achievable during Beginning-of-Cycle (BOC) conditions – limiting power distribution
  - 105.5% core flow achievable for most of operating cycle (after BOC and before EOC)
  - 109.5% core flow achievable at End-of-Cycle (EOC) conditions – feedwater temperature reduction and power coastdown
- The practical core flow operating window at EPU rated conditions is from **101.0% to 105.5%**.
  - Operational margin to the MELLLA boundary at 99.0% flow
  - Higher core flows used at EOC conditions.

# MELLLA+ SRLR

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- MELLLA+ Supplemental Reload Licensing Report (SRLR) submitted to NRC as supplemental information to MELLLA+ License Amendment Request
  - Reload analysis based on currently operating core design
  - Minor CPR thermal limit increase reflects SLMCPR adder and additional uncertainty for Two Loop Operation (TLO) and small changes to limiting transients for MELLLA+
  - No impact on Linear Heat Generation Rate (LHGR) limits, Maximum Average Planar Linear Heat Generation Rate (MAPLHGR) limits unchanged.

# MELLLA+ SRLR (Continued)

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- **Stability section reflects move to DSS-CD solution**
  - Manual Backup Stability Protection (BSP) and Automated Backup Stability Protection (ABSP) tables, information provided
- **Appendix F addresses/updates applicable Limitations and Conditions (L&C) from NEDC-33173P- A Rev. 4 (Interim Methods Licensing Topical Report (LTR))**
- **New Appendix G addresses applicable L&C from NEDC-33006P-A Rev 3 (MELLLA + LTR)**

# MELLLA+ Operator Procedures and Training

**Dave Turek**



**Exelon** Generation®

# License Conditions

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Operation in the MELLLA+ domain is prohibited when operating with one of the following plant configurations:

- Reactor Recirculation System Single Loop Operation
- Feedwater Heater Out of Service - A feedwater heater out of service resulting in more than a 10 °F reduction in feedwater temperature below the design feedwater temperature

# Tech Spec Changes

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- OPRM Upscale Function
- Change the Allowable Value for APRM Simulated Thermal Power – High trip function
- Revise Single Loop Operation LCO – Exit M+ Region Immediately
- Changes to TS Administrative Section

# ATWS-I Time Critical Operator Actions

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TCOA	MELLLA+
Initiate Reactor Water Level Reduction	120 seconds (change for MELLLA+)
Initiate Standby Liquid Control System (SLCS) Injection	120 seconds (unchanged for MELLLA+)
Initiate Suppression Pool Cooling	660 seconds (unchanged for MELLLA+)

- Existing EOP strategy retained
- Use of new ATWS Rapid Response Cards (RRC) to streamline communications
- Control Room Supervisor (CRS) retains Command and Control for EOP strategy

# ATWS-I Time Critical Actions

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- **ATWS Rapid Response Cards - RRC directs:**
  - SLCS injection
  - Reactor water level reduction
- **NRC Audit observed use of RRC and time critical action in May 2015**
- **All operating crews have been trained on MELLLA+ ATWS-I time critical actions**
  - Initial License Training Class completed in March 2015
  - Licensed Operator Requalification Training completed in August 2015
- **All operating crews have demonstrated satisfactory completion of the ATWS-I time critical actions**

# ATWS-I Time Critical Actions

- **Audit Crew**

Action	Required Time (sec)	Average Completion Time (sec)	Average Deviation (sec)
SBLC Injection	120	54	2
Reactor Water Level Reduction	120	79	5

- **5 Operating Crews**

Action	Required Time (sec)	Average Completion Time (sec)	Average Deviation (sec)
SBLC Injection	120	73	12.9
Reactor Water Level Reduction	120	84	11.3

- The Audit crew and all operating crews have demonstrated ability to complete SBLC injection and water level reduction within required times
- 120 sec TCA Licensing Bases is practical and conservative

## Operator Actions – Event Example

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- Peach Bottom Recirculation Pump Trips Occurred on August 30, 2013 and February 19, 2015
  - Operator Expectation IAW procedure: OT-112 UNEXPECTED/UNEXPLAINED CHANGE IN CORE FLOW
  - Immediate Operator Action - If a Recirculation Pump has tripped, THEN INSERT ALL GP-9-2(3) control rods
- Two separate crews, same event , 27 months apart:
  - August 2013: Rod insertion initiated in 30 sec following pump trip
  - February 2015: Rod insertion initiated in 31 sec following pump trip
- Training Simulation January 2016:
  - Rod insertion initiated in 16 seconds following pump trip
- The above provides examples regarding operator actions during actual events, and simulations concerning: identification, diagnosis and immediate response
- This same relationship can be applied to ATWS identification, and immediate operator actions

# Conservatism of ATWS-I Time Critical Actions

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- Ample Operator Action and Analytical Margin Exists

## Actions

- Average training performance demonstrates 30% margin to action times assumed in licensing bases
  - Accounts for possible variation between training and during an actual ATWS event
    - Comparing the audit and training crew results useful when assessing uncertainty
  - Operator actions are similar for every ATWS
    - 5 week training cycle reinforces familiarity
- Systematic approach to ATWS-I is very well suited to repeatability

## Analysis

- Analytical sensitivity runs indicate that assuming 120 seconds for SBLC injection and RPV water level reduction meet regulatory criteria.
- Realistic inputs demonstrates further conservatisms

# Conclusions

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- **Implementation of MELLLA+ will provide significant benefits:**
  - PBAPS operators will have greater flexibility in using core flow adjustments to control reactivity
  - Reducing operator challenges, by regaining margin to the Load Line boundary
  - Increasing the station capacity factor during the operating cycle
  
- **PBAPS is ready to implement the MELLLA+ License Amendment**
  - Completed installation of the DSS-CD, firmware and testing
  - Completed training on required operator actions
  - Ready to implement Technical Specification, procedures, and testing



# **ACRS Full Committee**

## **Peach Bottom Atomic Power Station Units 2 and 3**

### **Maximum Extended Load Line Limit Analysis Plus (MELLLA+)**

**February 4, 2016**



# **NRC Staff Opening Remarks**

**Douglas Broaddus**

**Branch Chief**

**Plant Licensing Branch I-2**

**Division of Operating Reactor Licensing**

**Office of Nuclear Reactor Regulation**

# MELLLA+ Reviews

- Peach Bottom is the fourth MELLLA+ review
- Monticello approved on 3/28/14
- Grand Gulf approved on 8/31/15
- Nine Mile Point 2 approved on 9/2/15

# NRC Safety Evaluation

- Draft safety evaluation contains no open items.
- Proposed license amendment would provide additional operational flexibility, while maintaining plant safety.



# Introduction

**Rick Ennis**

**Senior Project Manager**  
**Division of Operating Reactor Licensing**  
**Office of Nuclear Reactor Regulation**

# Details of NRC Staff Review

- Application submitted 9/4/14
- Accepted for review on 10/14/14
- 9 NRR technical review branches
- Key review areas: reactor systems and human factors
- 40 RAI questions
- 8 supplements to application

# Audits

- 5/26/15 – 5/27/15 – Audit at Peach Bottom site focused on time critical operator actions
- 8/31/15 – 9/2/15 – Audit at GE-Hitachi focused on sensitivity calculations and methodologies for ATWS with instability events using TRACG

# Meeting Topics

- Open Session
  - Exelon overview of MELLLA+
    - Overview and history of key design issues
    - Overview of amendment request
    - Design and analyses supporting the amendment
    - Operator procedures and training
- Closed Session
  - Exelon presentation of MELLLA+ analyses
  - NRC staff presentation of reactor systems and human factors review

# **Regulatory Guide 1.127, Revision 2**

## **Criteria and Design Features for Inspection of Water Control Structures Associated With Nuclear Power Plants**

**ACRS Committee Meeting  
February 4, 2016**

**Robert Pettis, P.E., NRR/DE/EMCB**

# Purpose of Revision

- RG 1.127, Rev. 1, dated March 1978
- RG 1.127, Rev. 2, dated January 2016
  - Identifies and consolidates Federal guidelines
  - Standardizes with existing NRC staff positions
  - Focuses on applicable NRC regulations
  - Provides design and inspection guidance
  - Incorporates Public Comments
  - Responds to ACRS Comments

# Rev. 2 of RG 1.127 Consolidates Federal Guidelines

- New NRC Regulations and Federal Guidance Make RG 1.127, Rev. 1 Obsolete
- Federal Emergency Management Agency (FEMA)
  - FEMA publication 93, “Federal Guidelines for Dam Safety: Hazard Potential Classification System for Dams,” first issued in 1979
  - Updated multiple times since 1979
  - Currently contains guidance on multiple types of water control structures – Not Just Dams
  - FEMA guidance incorporated into NRC Inspection Procedures, NUREG-0800 (the SRP), and similar guidance documents

# Rev. 2 of RG 1.127 Standardizes With Existing NRC Staff Positions

- RG 1.127 revised to agree with staff guidance in other NRC documents including:
  - RG 3.11, “Design, Construction, and Inspection of Embankment Retention Systems at Uranium Recovery Facilities”
  - NUREG 0800, “Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition,” Section 2.5.4, “Stability of Subsurface Materials and Foundations” and Section 2.5.5, “Stability of Slopes”
  - Multiple NRC Inspection Procedures

# Rev. 2 of RG 1.127 Focuses on Applicable NRC Regulations

- General Design Criterion 45, “Inspection of Cooling Water System,” in Appendix A of 10 CFR Part 50
  - Requires cooling water system be designed to permit the appropriate periodic inspection of important components to ensure the integrity and capability of the system
- 10 CFR 50.34(a)(4) and 10 CFR 50.34(b)(4)
  - Require applicants provide an analysis and evaluation of the design and performance of structures, systems, and components
- Added 10 CFR Part 52 regulations

# Rev. 2 of RG 1.127 Provides Design and Inspection Guidance

- Provides current guidance for developing an inservice inspection and surveillance program for water control structures.
- Clarifies that RG applies to dams, slopes, canals, reservoirs associated with emergency cooling water systems and whose failure could either cause site flooding, the failure of the plant's emergency cooling systems, or otherwise endanger the plant.
- Scope includes embankments and other appurtenant structures associated with or part of a water control structure typically built to protect the plant.

# Rev. 2 of RG 1.127 Incorporates Public Comments

- Rev. 2 of RG 1.127 was issued for public comment as DG-1245 on January 23, 2015, (80 FR 3661)
- Only one set of comments received and addressed
- Most comments editorial in nature
- Comments incorporated into RG 1.127, Rev. 2 as applicable
- Staff responses to comments 7, 8, 9, and 14 clarified in response to ACRS comments

# Rev. 2 of RG 1.127 Responds to ACRS Comments

- Section C “Applicability” revised
- Title revised
- Section C.2 added discussion for “Aggressive Water Environment”
- Section C.5.f revised to include consideration for remote-monitoring instrumentation
- Section C.6.b and C.9.c revised to replace “**significant**” with “**important**” to water control structure (e.g., an earthquake that meets or exceeds design basis for structure or component)

# Questions?

## Typical Water Control Structures

