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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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627TH MEETING

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

(ACRS)

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THURSDAY

SEPTEMBER 10, 2015

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ROCKVILLE, MARYLAND

The Advisory Committee met at the Nuclear  
Regulatory Commission, Two White Flint North, Room  
T2B3, 11545 Rockville Pike, at 8:30 a.m., John W.  
Stetkar, Chairman, presiding.

COMMITTEE MEMBERS:

- JOHN W. STETKAR, Chairman
- DENNIS C. BLEY, Vice Chairman
- MICHAEL L. CORRADINI, Member-at-Large
- SANJOY BANERJEE, Member
- CHARLES H. BROWN, JR., Member
- DANA A. POWERS, Member
- JOY REMPE, Member
- PETER RICCARDELLA, Member
- GORDON R. SKILLMAN, Member

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1 DESIGNATED FEDERAL OFFICIAL:

2 KENT HOWARD

3 JOHN LAI

4

5 ALSO PRESENT:

6 JOHN DAILY, NRR/DLR

7 YOIRA DIAZ-SANABRIA, NRR/DLR

8 NESTOR FELIZ-ADORNO, NRR/DIRS

9 DON HARRISON, RES

10 ALAN HISER, NRR/DLR

11 JANE MARSHALL, NRR/DLR

12 JAMES MEDOFF, NRR/DLR

13 CHRIS MILLER, NRR/DLR

14 REBECCA RICHARDSON, NRR/DLR

15 VICTORIA ANDERSON, NEI

16 JIM ANNETT, Exelon

17 JOHN BASHOR, Exelon

18 DON BRINDLE, Exelon

19 JACK FEIMSTER, Exelon

20 MIKE GALLAGHER, Exelon

21 JOHN HUFNAGEL, Exelon

22 ALBERT PINA, Exelon

23 TOM QUINTENZ, Exelon

24

25 \*Present via telephone

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

8:31 a.m.

CHAIRMAN STETKAR: The meeting will now come to order. This is the second day of the 627th meeting of the Advisory Committee on Reactor Safeguards.

During today's meeting, the committee will discuss the following: Byron-Braidwood combined license renewal application, advanced light water reactor probabilistic risk assessment requirements, interim staff guidance, BB COL, ISG 028, meeting with NRC Chairman Burns and preparation of ACRS reports.

This meeting is being conducted in accordance with the provisions of the Federal Advisory Committee Act. Mr. Kent Howard is the designated federal official 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 listening mode during the presentations and committee discussion.

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

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1 with sufficient clarity and volume so that they can be  
2 readily heard and I'll remind everyone in the room to  
3 please check your little communications devices and  
4 turn them off.

5 And with that, unless there are any other  
6 comments from members of the committee, we'll begin  
7 with the Byron-Braidwood combined license renewal  
8 application and Dick Skillman will lead us through  
9 this session. Dick?

10 MEMBER SKILLMAN: Mr. Chairman, thank you.  
11 I'm Gordon Skillman. I'm chairman of the Plant  
12 License Removal Subcommittee. This is an agenda item  
13 six for this ACRS meeting. Byron Station Units 1 and  
14 2 and Braidwood Station Unit 1 and 2 license renewal  
15 application.

16 This morning we will hear presentations from  
17 the Division of License Renewal and the Licensee  
18 Exelon Generation Company, LLC - Exelon, and I call  
19 upon Chris Miller to begin the presentation, please.

20 MR. MILLER: Thank you, Mr. Skillman. As  
21 stated, I'm Chris Miller, director of the Division of  
22 License Renewal and the management team sitting next  
23 to me, Jane Marshall, the deputy director for the  
24 Division of License Renewal, and Yoira Diaz, branch  
25 chief in Project Branch One.

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1           Also joining us are branch chiefs behind me,  
2           Dennis Morey, Brian Wittick, Jim Dana and Steve Blume.  
3           In the audience we have from Region 3 Nestor Feliz.  
4           He's the lead inspector from Region 3 for the Byron-  
5           Braidwood inspections.

6           John Daily will provide the Byron-Braidwood  
7           safety evaluation report presentation and he will be  
8           joined at the table by DLRC technical advisor Dr. Alan  
9           Hiser and safety project manager Becca Richardson.

10          We also have with us in the audience  
11          supporting staff members who will be identified when  
12          they present or speak.

13          This is the full committee meeting for  
14          license renewal application for Byron Station's Unit  
15          1 and 2 and Braidwood Station Unit 1 and 2.

16          This was a combined license renewal  
17          application for the two sites. We are here today to  
18          provide the staff's overview of their final review of  
19          the application.

20          On December of last year, we met with the  
21          ACRS subcommittee to discuss the staff's safety  
22          evaluation report with open items that was issued  
23          October 30th of 2014.

24          The staff identified two open items related  
25          to CRDM nozzle wear and environmentally-assisted

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1 fatigue of Class 1 components. The resolutions for  
2 the two open items are documented in the final SER  
3 issued July 6th, 2015.

4 In today's presentation, the staff will go  
5 into more details on the resolution of those open  
6 items. In addition to those resolutions that staff  
7 will update the committee on some other issues that  
8 have been introduced at the subcommittee but were not  
9 yet fully evaluated. Those issues have now been  
10 closed.

11 At this time, I'd like to turn the  
12 presentation over to Exelon and the vice president for  
13 license renewal, Mike Gallagher, to introduce his team  
14 and commence their presentation. Mike?

15 CHAIRMAN STETKAR: For those of you - we've  
16 changed our protocol here. When you speak just push  
17 the bottom part of the microphone there. The little  
18 green light will come on and when you're not speaking  
19 please leave the mics off because it just helps  
20 everybody to cut down on noise.

21 MR. GALLAGHER: Okay. Good. Good morning.  
22 My name is Mike Gallagher. I'm the vice president of  
23 license renewal projects at Exelon.

24 I have 34 years of nuclear power plant  
25 experience, all at Exelon, and have been working on

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1 our license renewal project since 2006.

2 Slide 1 please. So before we get into  
3 today's presentation I would like to introduce the  
4 presenters. To my right is John Bashor, and John is  
5 the Braidwood engineering director. John has over 31  
6 years of nuclear power plant experience including the  
7 last five years at Braidwood.

8 To John's right is Albert Pina, and Albert  
9 is our license renewal manager for the Byron-Braidwood  
10 project. Albert has over 33 years of nuclear power  
11 plant experience including working on Exelon's license  
12 renewal project since 2008.

13 To my left is John Hufnagel, and John is our  
14 project licensing lead. John has 36 years of nuclear  
15 power plant experience including working on Exelon's  
16 license renewal project since 2005.

17 In addition to our technical support  
18 personnel, which we have in the audience, we also have  
19 with us today here Chuck Keller, and Chuck is our  
20 Byron engineering director. Mark Kanavos - Mark is  
21 our site vice president at Braidwood.

22 We have Russ Kearney, and Russ is our site  
23 vice president at Byron, and then we have Dan Enright,  
24 and Dan is our senior vice president of Midwest  
25 operations.

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1 Slide 2, please. This slide shows our  
2 agenda for the presentation. We will present to you  
3 some background information about the stations, the  
4 highlights of our - and the highlights of our license  
5 renewal application.

6 Then we'll present to you our resolutions -  
7 the resolutions on the open items in the SER and items  
8 of interest from the Region 3 inspections.

9 We believe we developed a high-quality  
10 license renewal application. We also developed  
11 effective aging management programs to ensure the  
12 continued safe operation of Byron and Braidwood.

13 We do appreciate this opportunity to make  
14 the presentation and look forward to any questions you  
15 may have. Now I'll turn the presentation over to John  
16 Bashor. John?

17 MR. BASHOR: Thank you, Mike. Slide 3,  
18 please.

19 Good morning. My name is John Bashor. I'm  
20 the engineering director at Braidwood Generating  
21 Station. Let me first explain our presentation color  
22 coding.

23 We have a gray highlighted header on slides  
24 where we are presenting information that is common to  
25 both stations. For Byron-only information, the header

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1 or information is highlighted green and for the  
2 Braidwood-only, blue.

3 Byron and Braidwood Stations Units 1 and 2  
4 are Westinghouse pressurized water reactor 4 loop  
5 designs owned and operated by Exelon. The Byron  
6 Generating Station is located in the state of Illinois  
7 approximately 95 miles northwest of Chicago.

8 The Braidwood Generating Station is located  
9 in the state of Illinois approximately 60 miles  
10 southwest of Chicago. Slide 4, please.

11 This slide shows an overview of the Byron  
12 Generating Station. On the slide you can see the  
13 containment structures, the auxiliary building, the  
14 turbine building, which are located in the center of  
15 the presentation.

16 The circulating water cooling towers and  
17 flume, the circulating water pump house, the  
18 independent spent fuel storage facility, the 345 kV  
19 switch yard and the essential service water cooling  
20 towers, which are the station's ultimate heat sink.

21 Slide 5, please. This slide shows an  
22 overview of the Braidwood Generating Station. On the  
23 slide, you can see the containment structures, the  
24 auxiliary building, the turbine building located in  
25 the center of the slide, the Lake Screen House, the

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1 independent spent fuel storage installation, the 345  
2 kV switch yard and the cooling pond which contains the  
3 stations ultimate heat sink.

4 As you can see from these overviews, with  
5 the exception of the cooling water source, the  
6 physical and design characteristics of the two  
7 stations are essentially identical.

8 Slide 6, please. The slide provides an  
9 overview of the Byron and Braidwood history and some  
10 major station improvements. Byron was initially  
11 licensed in 1984 for Unit 1 and 1986 for Unit 2.

12 Braidwood was initially licenses in 1986 for  
13 Unit 1 and 1987 for Unit 2. All four units were  
14 initially licensed for a rate of thermal power of  
15 3,411 megawatts thermal.

16 A 5 percent increase in rated power on all  
17 four units was performed in 2001. In April of 2014,  
18 a 1.63 percent measurement on certainty recapture  
19 power-up rate was implemented which increased the  
20 thermal rating on each unit to their current rating of  
21 3,645 megawatts thermal.

22 Exelon has also continued to make  
23 substantial improvements to both Byron and Braidwood  
24 units such as steam generator replacements on Byron  
25 Unit 1 and Braidwood Unit 1, emergency core cooling

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1 system recirculation sump screen modifications, spent  
2 fuel rack replacements and the independent spent fuel  
3 storage installation.

4 Byron and Braidwood are operated on 18-month  
5 fuel cycles. The average capacity factor for all four  
6 units year to date through the second quarter is  
7 greater than 96 percent. The license renewal  
8 application was submitted on May 29th, 2013. Our  
9 current licenses for Byron expire on October 31, 2024,  
10 for Unit 1, November 6th, 2026 for Unit 2.

11 Our current licenses for Braidwood expire on  
12 October 17th, 2026 for Unit 1 and December 18th, 2027,  
13 for Unit 2. I will now turn it over to Albert Pina,  
14 who will present to you the highlights of our license  
15 renewal application.

16 MR. PINA: Thank you, John.

17 Slide 7, please. Good morning. My name is  
18 Albert Pina and I am the Byron and Braidwood license  
19 renewal manager. I will discuss the highlights of our  
20 license renewal application including aging management  
21 programs and commitments.

22 I will also provide an overview of the  
23 resolution of the two open items in the SER. Slide 8,  
24 please.

25 In preparing the application, Exelon used

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1 industry and NRC guides to make the application as  
2 consistent with the goal as possible. Our submittal  
3 was based on GALL Revision 2.

4 The reviews for the license renewal  
5 application were performed on a unit-specific basis to  
6 assure any differences between the four units were  
7 identified and addressed. The units are essentially  
8 identical.

9 The majority of differences identified were  
10 related to the difference in the ultimate heat sinks  
11 at the stations and the fact that the Unit 1 steam  
12 generators were replaced at both Byron and Braidwood.

13 There are 45 aging management programs at  
14 Byron and 44 at Braidwood. The difference in the  
15 number of aging management programs is due to the fuse  
16 holder program which is applicable to Byron only.  
17 There is safety-related equipment found only at Byron  
18 River Screen House that required the application of  
19 this aging management program.

20 CHAIRMAN STETKAR: Albert, why is the fuse  
21 holder program only applicable to Byron and not  
22 Braidwood?

23 MR. PINA: The reason being is that there is  
24 fuse holders that are in scope and subject to aging  
25 management review at the Byron River Screen House

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1 associated with the SX essential service order make-up  
2 pump for our mechanical -

3 CHAIRMAN STETKAR: Okay. So that - it is  
4 related to differences in the ultimate heat sink?

5 MR. PINA: That's correct.

6 CHAIRMAN STETKAR: Thank you.

7 F: So while you were interrupted earlier  
8 you only replace the steam generators in Unit 1 for  
9 each plant and there's no plan to have to replace it  
10 in Unit 2 for each plant?

11 MR. BASHOR: That's actually reviewed every  
12 five years - that's reviewed every five years. We  
13 look at the long-term asset management plans for both  
14 stations.

15 Currently, for Byron and Braidwood we have  
16 that out in 2025 to review for the start of steam  
17 generator replacement on Unit 2.

18 But that is reviewed every five years and we  
19 will evaluate the condition of the Unit 2 steam  
20 generators continuously as we get our examinations in  
21 the refueling outages and determine if that  
22 replacement would be required.

23 MEMBER REMPE: So why was there a difference  
24 in the steam generator need to have it replaced in  
25 Unit 1 versus Unit 2?

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1 MR. BASHOR: Unit 1 with the D-4 steam  
2 generators had no annealed Alloy 600 tubes that were -  
3 that were subjected to stress corrosion cracking,  
4 leading to accelerated tube wear and plugging. It  
5 drove us to replacement on the Unit 1 steam generators  
6 in the mid '90s on both Byron and Braidwood Unit 1.

7 MEMBER REMPE: Okay. It's interesting they  
8 had different tube materials.

9 MEMBER RICCARDELLA: What was the material?  
10 What was the material for the Unit 2 generator?

11 MR. BASHOR: They're Alloy 600 but they're  
12 thermally treated.

13 MEMBER RICCARDELLA: Thermally treated. All  
14 right.

15 MR. BASHOR: Albert?

16 MR. PINA: Okay. Thirty-seven Byron  
17 programs and 35 Braidwood programs are consistent with  
18 the GALL. Eight programs at Byron and nine programs  
19 at Braidwood have exceptions to the GALL.

20 There are 47 license renewal commitments at  
21 Byron and 46 at Braidwood. Of these commitments, 45  
22 at Byron and 44 at Braidwood are associated with aging  
23 management programs.

24 In addition, one common commitment at each  
25 station implements the operating experience program

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1 enhancements. The final commitment for each station  
2 is to restore the out of service reactor vessel studs  
3 on Byron Unit 2 and on Braidwood Unit 2 no later than  
4 six months prior to entering the period of extended  
5 operation.

6 During the Byron Unit 2 refueling outage in  
7 the fall of 2014, Exelon removed the previously stuck  
8 reactor head closure stud 11 and installed a new stud  
9 at this location, thereby completing this license  
10 renewal commitment for Byron.

11 All the license renewal commitments are  
12 captured within the station commitment tracking  
13 database and will be included within the license  
14 renewal UFSAR supplement and manage in accordance with  
15 10 CFR 50.59 and the commitment management program  
16 which is based on the NRC-endorsed NEI 99 tack 04  
17 process.

18 Slide 9, please. The next topic to be  
19 presented is the resolution of the two open items in  
20 the Byron and Braidwood SER. Slide 10. The first  
21 open item was associated with the screening  
22 methodology for an environmentally assisted fatigue to  
23 determine the leading locations.

24 Exelon and Westinghouse used a screening  
25 methodology to determine leading locations for EAF.

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1 These included NUREG 62.60 locations and those  
2 locations determined to be more limiting than the  
3 62.60 locations.

4 The NRC staff requested additional  
5 information on a methodology. This open item was  
6 resolved by providing the requested the information  
7 and justification to address each of the NRC staff's  
8 questions related to the screening methodology and  
9 adding locations to the list of leading equipment  
10 locations that will be monitored for the pressurizes  
11 and steam generators.

12 The locations added were the lower head at  
13 the heater penetration and the upper shelf on the  
14 pressurizers as well as the inlet and outlet nozzle  
15 wells on the Unit 1 steam generators.

16 The second open item involved the -

17 MEMBER SKILLMAN: Albert, before you  
18 proceed, should we assume that the environmentally-  
19 assisted fatigue added locations are the same for all  
20 four units?

21 MR. PINA: That's correct. They are.

22 MEMBER SKILLMAN: Understand they're the  
23 same locations?

24 MR. PINA: That's correct.

25 MEMBER SKILLMAN: Yes, sir. Thank you.

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1 MR. PINA: The second open item involved the  
2 aging management of the control rod drive mechanism,  
3 or CRDM housing, for wear due to thermal sleeve  
4 rotation. Rotation of the thermal sleeves within the  
5 CRDM housing occurs during normal operations due to  
6 the reactor coolant flow in this region.

7 This issue is common to the Westinghouse  
8 pressurized water reactor designs and has been  
9 evaluated by Westinghouse for the PWR Owners Group.  
10 The CRDM housing is managed by the ASME Section 11,  
11 subsection IWBCD Aging Management Program to verify  
12 the CRDM housing wear is as expected.

13 Exelon added a commitment to perform UT  
14 examinations over the five center most CRDM housings  
15 on each unit during the ten-year period prior to the  
16 PEO and every ten years in the PEO. The five center  
17 most CRDM housing penetrations are the most  
18 representative and leading locations for wear  
19 examinations because of the stress conditions in  
20 proximity to the J groove welds.

21 I will now turn it over to John Bashor, who  
22 will present to you the resolution of the items of  
23 interest from the Region 3 inspections.

24 MEMBER RICCARDELLA: Excuse me. As I  
25 recall, you had cracking in the CRDM nozzle welds, I

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1 think, in three of the four units. Is that correct?

2 MR. PINA: Correct.

3 MEMBER RICCARDELLA: So what are your plans  
4 with respect to the top head? Are you going to do  
5 replacements eventually or are you going to mitigate?

6 MK: Yeah. We can have Jack - Jack Feimster  
7 can answer that question. The question was about  
8 mitigation of the heads, Jack.

9 MEMBER RICCARDELLA: The head nozzle.

10 MR. FEIMSTER: Yes. My name is Jack  
11 Feimster. I'm an engineering manager for Exelon  
12 currently stationed at Byron. For the reactor vessel  
13 heads we've chosen a mitigation strategy rather than  
14 replacement of the heads.

15 That mitigation strategy will be peening.  
16 We will peen the OD, the ID and the J group weld,  
17 thereby removing one of the three conditions required  
18 for PWSCC.

19 MEMBER RICCARDELLA: Thank you.

20 MEMBER BALLINGER: I have a follow-on  
21 question. After the peening what kind of - what plan  
22 is in place to make sure that things stay the way you  
23 think they are?

24 MR. FEIMSTER: Currently, we're under a  
25 50.55(a) inspection plan that requires that we go in

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1 and inspect them each and every outage.

2 MEMBER BALLINGER: Okay. Thank you.

3 MR. BASHOR: Thank you, Albert. Slide 11,  
4 please.

5 There were three items of interest that  
6 arose during the Region 3 inspections at Byron and  
7 Braidwood. Slide 12, please.

8 The first topic was associated with the  
9 visual examination of concrete containment structures  
10 under the ASME Section 11 Subsection IWL Aging  
11 Management Program.

12 During the NRC Region 3 inspection, the  
13 inspection team sought additional clarification  
14 regarding whether the visual resolution capability of  
15 remotely performed examinations will be sufficient to  
16 quantify the degradation for comparison against the  
17 qualitative acceptance criteria described in Chapter  
18 5 of ACI 349.3R. To resolve this item and to ensure  
19 that sufficient visual resolution capability will be  
20 used during the direct and remove visual examination  
21 of concrete surfaces of containment structures, Exelon  
22 added a commitment to require that the visual  
23 resolution capability for remove and direct visual  
24 examinations be sufficient to detect concrete  
25 degradation at the levels described in Chapter 5 of

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1 ACI 349.3R.

2 The second topic was aging management of the  
3 CRDM seismic support assembly. During the NRC Region  
4 3 inspection discussions were held with the NRC staff  
5 regarding why the ASME Section 11 Subsection IWF Aging  
6 Management Program was not credited for aging  
7 management of the CRDM seismic support assemblies as  
8 part of the license renewal application.

9 The external surfaces monitoring and boric  
10 acid corrosion aging management programs were credited  
11 in the original LRA for the aging management of all  
12 elements of the integrated head assembly, which  
13 included the CRDM seismic support assembly. To  
14 resolve this item, Exelon added the CRDM seismic  
15 support assembly to the scope of the IWF program.

16 Slide 13, please. The third topic was  
17 associated with the Braidwood flux thimble -

18 MEMBER SKILLMAN: John, back up one slide,  
19 please. How much work - how much actual labor is  
20 involved in fulfilling that commitment?

21 MR. BASHOR: Which one, Mr. Skillman?

22 MEMBER SKILLMAN: The - adding the CRDM SSA  
23 to the IWF program. That's an inspection.

24 MR. BASHOR: Yes, sir.

25 MEMBER SKILLMAN: How much - how much real

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1 work is involved in it?

2 MR. BASHOR: It's a visual inspection.  
3 Jimmy? It's the IWF program. Jim? Jim? The  
4 question is about additional work on doing that.

5 MR. ANNETT: My name is Jim Annett. I'm on  
6 the license renewal project team. The CRDM seismic  
7 support assemblies are done but they're accessible  
8 structures. So it's going to be another VT3  
9 inspection. So there's no, like, further disassembles  
10 associated with it so it's going to be another support  
11 structure or support added to the program.

12 MEMBER SKILLMAN: This is basically visual,  
13 look at the bolt, take a picture, confirm no  
14 degradation?

15 MR. BASHOR: Yeah, it's a visual inspection  
16 and, Mr. Skill man, we had - we thought we had it  
17 covered under the external surfaces monitoring and  
18 boric acid program, which we do a visual. So the IWF,  
19 you know adds or - is specific to a VT3 inspection.  
20 So that's really what's being added in this case.

21 MEMBER SKILLMAN: How do you know the bolts  
22 are tight?

23 MR. ANNETT: My name is Jim Annett, license  
24 renewal project team. This is primarily like a pin-  
25 connected structure so it's pins fit in holes. The

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1 bolts, they had - it's more of a - it's visually  
2 addressed but the bolts themselves are not like a  
3 tension bearing - they aren't tension bearing bolts so  
4 they're kind of - so they maintain pieces - they  
5 maintain the assembly together but -

6 MEMBER SKILLMAN: Maybe you can get back to  
7 us offline.

8 MR. ANNETT: Yeah, I'll get back to it.

9 MEMBER SKILLMAN: If it's a seismic joint I  
10 would assume that it is relatively tightly connected  
11 to take care of the loading that would come to that  
12 joint.

13 MR. ANNETT: I mean, you have pins fit  
14 inside of holes that then fit inside of lugs. So it's  
15 just kind of a - so that's how they fit together and  
16 then there's a nut on the outside to make sure that  
17 the pins don't slide in and out. That's how that's  
18 assembled.

19 MEMBER SKILLMAN: Thank you.

20 MR. BASHOR: Slide 13, please. The third  
21 topic is associated with the Braidwood flux thimble  
22 eddy current testing program.

23 The item of interest comes from the  
24 difficulties Braidwood had experienced in obtaining  
25 eddy current data on the flux thimble tubes during

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1 planned evolutions in recent refueling outages.

2 The difficulties were due to increased  
3 resistance or restriction when inserting and  
4 traversing the eddy current probes through the flux  
5 thimble tubes.

6 The NRC reviewed the operating experience  
7 during the Region 3 inspection of Braidwood and  
8 captured it as an item of interest.

9 This issue was only applicable to Braidwood  
10 since Byron has not experienced similar difficulties  
11 in obtaining eddy current testing data.

12 To address this issue, Exelon added a  
13 commitment to resolve the recent difficulties in  
14 obtaining eddy current data prior to PEO and Exelon  
15 also added a commitment to replace a flux thimble tube  
16 every two refueling outages if required eddy current  
17 data is not obtained for that tube.

18 We have implemented corrective actions to  
19 resolve the eddy current data gathering issue and  
20 successfully obtained eddy current data for all 58  
21 flux thimble tubes and the most recent Braidwood Unit  
22 1 refueling outage completed in spring of 2015.

23 This gives us high confidence that we will  
24 obtain eddy current data in Braidwood Unit 2 in the  
25 upcoming October 2015 outage as well as all other

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1 required data going forward. I will now turn the  
2 presentation over to Mike Gallagher for closing  
3 remarks.

4 CHAIRMAN STETKAR: Before we do that, I have  
5 a couple of kind of off the wall questions that were  
6 sort of follow-ons from our subcommittee meeting.

7 There was - there was some discussion about  
8 reactor vessel head closure studs that - one stud on  
9 each unit that was stuck - stud number 35 on Braidwood  
10 and stud number 11 on Byron.

11 I only mention that to give people some time  
12 to think about what I'm going to ask. At our  
13 subcommittee meeting we were informed that Byron stud  
14 number 11 on Unit 2 has been replaced but that  
15 Braidwood personnel are still developing plans to  
16 repair the whole for Unit 2 stud number 35, which  
17 according to my notes has been bored out but you  
18 haven't done anything with it.

19 How are you doing on the plans to repair or  
20 do something with that hole? Have you made any plans?  
21 Have you done anything?

22 MR. GALLAGHER: Yeah. This outage, Mr.  
23 Stetkar, there's measuring that are going to be taken.  
24 This outage being on October?

25 CHAIRMAN STETKAR: Yeah, this fall.

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1 MR. GALLAGHER: Measurements will be taken  
2 and from there the design will be created for the fix.

3 CHAIRMAN STETKAR: Good. Thank you. So it  
4 is an act of progress?

5 MR. GALLAGHER: Yeah.

6 CHAIRMAN STETKAR: The other thing that I  
7 had is that apparently the external insulation, parts  
8 of it on the - I guess the upper part of the Byron  
9 condensate storage tanks that had separated or slipped  
10 out - I don't recall, I only have brief notes here and  
11 I didn't go bother to look at the details - and,  
12 again, that our subcommittee meeting last December it  
13 said - you said that the repairs to that insulation  
14 are still in the planning process.

15 You didn't observe - hadn't observed any  
16 material degradation of the tank itself and didn't  
17 believe that it was a high priority issue. Have you  
18 done anything on that insulation?

19 MR. GALLAGHER: Yes, we have.

20 CHAIRMAN STETKAR: Oh. Don?

21 MR. BRINDLE: Don Brindle, Byron license  
22 renewal site lead. In May, we inspected the tank.  
23 Some VT3 qualified personnel looked at the exposed  
24 parts of the tank including the top and some thermal  
25 couple penetrations near the bottom.

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1           There was no indications of any cracking,  
2 blistering or aging degradation. Physical repairs of  
3 the insulation and clashing have been completed and  
4 the caulking - recaulking of the tank is in progress.

5           CHAIRMAN STETKAR: Thank you very much.  
6 That's all I have. Thanks.

7           MR. GALLAGHER: Okay. With that, in  
8 conclusion, we believe we developed a comprehensive  
9 high-quality license renewal application and robust  
10 aging management programs that will ensure the  
11 continued safe operation of Byron and Braidwood.

12           Pending any other questions, this concludes  
13 our presentation.

14           MEMBER SKILLMAN: Colleagues, any questions  
15 for the Exelon team?

16           MR. HARRISON: I have a -

17           MEMBER SKILLMAN: Don, go ahead please.

18           MEMBER BALLINGER: I've been going through  
19 the SER looking at the exemptions and there's a  
20 paragraph in there which I just don't understand.

21           It has to do with the PT - pressure  
22 temperature curve development and the exemptions  
23 associated with that. And there's a paragraph in  
24 there and it's short enough to read. The applicant  
25 stated that all these exemptions are based on the PT

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1 limit curves that are in effect at 32 effective full  
2 power years. Good.

3 The applicant stated that based on the  
4 projections described in the LRA the units are  
5 expected to exceed 32 effective full power years prior  
6 to entering the period of extended operation, thereby  
7 necessitating updates to the curve.

8 I'm paraphrasing a little bit. The  
9 applicant stated that it anticipates that these  
10 exemptions will not be required for the period of  
11 extended operation, okay.

12 The applicant clarified that if the BBS  
13 reactors do not reach 32 effective full power years  
14 prior to the period of extended operations, these  
15 exemptions are acceptable for the period of extended  
16 operation because the staff did not place a limitation  
17 on the time of applicability for these exemptions. I  
18 don't understand that.

19 MR. GALLAGHER: Tom, do you have the answer  
20 to that questions?

21 MEMBER BALLINGER: Is this just an  
22 administrative thing or is there something else?

23 MR. QUINTENZ: Tom Quintenz, Exelon license  
24 renewal team. Basically, you're right, it's  
25 administrative. But, basically, when we look at it

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1 from a time limit at an aging analysis perspective we  
2 look at the time aspects, and since these are attached  
3 to the PT curves, which are associated with a 32 EFPY,  
4 and the staff has accepted that 32 EFPY, even though  
5 the year you would go past the current operating  
6 period the 32 EFPY would be the governing parameter  
7 that would tell you that that exemption is still good.

8 MR. GALLAGHER: See, we got an REI on this  
9 particular one and what it was was we shouldn't go  
10 past 32 because of our operating - because we operate  
11 the plant.

12 But what if we shut down the plant for a  
13 number of years and we were - we didn't go past 32  
14 EFPY in the first 40 years of operation? And so, you  
15 know, would that exemption have to be carried and we  
16 said well, it would still be valid up to 32 but, you  
17 know, we don't claim to do that because we plan to  
18 operate the plant for the - for the full period.

19 So it is administrative so the staff had  
20 questioned, you know, okay, but what if you don't  
21 operate - you could be going into the period of  
22 extended operation under 32 EFPY. In theory - in  
23 theory that's possible. I don't think Dan would like  
24 that if we were not operating.

25 MR. MEDOFF: This is Jim Medoff with the

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1 staff. I can clear this up. I was the reviewer for  
2 their methodology for identifying TLAs and exemptions.  
3 They have a number of exemptions from the requirements  
4 for calculating PT limits of number of code cases that  
5 they use.

6 They were - those code cases were developed  
7 way back in the day so and they update their PT limits  
8 through a pressure temperature limits report  
9 requirement in the administrative control's tech  
10 specs.

11 The code cases were incorporated into the  
12 methodology for the PTLRs. But what happened is  
13 because ASME updates the code it's because those code  
14 cases were approved back in the day the ASME has now  
15 taken the code case methods, worked it into the more  
16 recent additions of the codes and then when they  
17 update their PTLRs they may go to just use the ASME  
18 codes for the updates of the PT limits.

19 They wouldn't need the code cases anymore.  
20 So the exemptions wouldn't be needed.

21 MEMBER BALLINGER: Okay. Do you understand  
22 that?

23 MEMBER RICCARDELLA: I think so.

24 MEMBER BALLINGER: Okay. I think I  
25 understand that.

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1 MEMBER RICCARDELLA: I think the point is  
2 you will be updating your limit - your pressure  
3 temperature limit curves continuously through the  
4 period of extended operations.

5 MR. GALLAGHER: Yes, before --

6 (Simultaneous Speaking.)

7 MR. GALLAGHER: And that's part of the  
8 process.

9 MEMBER SKILLMAN: Exelon team, thank you,  
10 Ron, thank you colleagues. Any other questions from  
11 the ACRF members here?

12 Hearing none, thank you and I'm going to  
13 call upon John Daily to bring his team to the table.  
14 Exelon team, thank you.

15 MR. DAILY: Mr. Chairman, in deference to  
16 the latest OIS rules -

17 CHAIRMAN STETKAR: Come to the microphone  
18 because we do have to have you on the record.

19 MR. DAILY: I'm sorry.

20 CHAIRMAN STETKAR: We trust you.

21 MR. DAILY: Just put in the thumb drive and  
22 go.

23 MEMBER SKILLMAN: Well, it'll take a little  
24 bit of time because it may take a couple minutes.

25 CHAIRMAN STETKAR: That's fine. We'll -

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1 MALE PARTICIPANT: We'll close our eyes when  
2 you put in all the notes.

3 CHAIRMAN STETKAR: We'll be quiet. We are  
4 officially safe and legal?

5 MR. DAILY: I believe so, yes. Thank you.  
6 Good morning, Mr. Stetkar, and Mr. Skillman and  
7 members of the ACRS. My name is John Daily. I'm the  
8 licensed renewal project manager for the Byron station  
9 and the Braidwood Station license renewal safety  
10 review.

11 We're here today to discuss the review of  
12 the Byron and Braidwood license renewal application as  
13 documented in the safety evaluation report, which was  
14 issued in July 6th, 2015.

15 The introductions have already been made.  
16 I'll just - joining with me here on the table are Dr.  
17 Alan Hiser, who is our DLR senior level advisor, and  
18 Ms. Rebecca Richardson, the DLR safety project  
19 manager. She's running the slides for us today.

20 Also out in the audience is Mr. Nestor  
21 Felis-Adorno, who is the safety senior reactor  
22 inspection - excuse me, who is the senior reactor  
23 inspector for Region 3. He's with us today in the  
24 audience.

25 Also in the audience, of course, are other

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1 members of the technical staff who participated in the  
2 review of the license renewal application and also  
3 conducted the onsite audits.

4 Next slide. This is an outline of today's  
5 presentation. I think most of the items have already  
6 been introduced so we won't spend a lot of time on it  
7 but we will be presenting the staff's review of  
8 closing the open items, closure of the updates and  
9 closure of the relevant items of interest that we  
10 mentioned and also the overall staff conclusion for  
11 the safety evaluation.

12 Next slide. This is just an overview of the  
13 recent milestones that have been achieved relating to  
14 the current review of the Byron and Braidwood license  
15 renewal application.

16 I'll just point out that the subcommittee  
17 meeting was last December, December 3rd, 2014. All of  
18 the open items in the SER are now closed. All of the  
19 items of interest, the 71002 issues for the SER are  
20 also resolved and, of course, then the final SER was  
21 issued. The applicant, obviously, covered most of the  
22 points during their presentation on this.

23 Next slide. SER Section 3 contained the  
24 first open item. As presented to the subcommittee, OI  
25 3.0.3.1.3-1 pertained to wear in the applicant's CRDM

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1 nozzles.

2           During the AMP audit, the staff noted  
3 operating experience which indicated that the  
4 applicant's CRDM nozzles had experienced wear near the  
5 J groove weld due to interactions with the CRDM  
6 thermal sleeve centering tabs.

7           The applicant did not propose examinations  
8 at that time to monitor the wear during PEO. However,  
9 in its response to the staff REIs, applicant stated  
10 that it was participating instead in the Westinghouse  
11 Owners Group project, which was expected to provide a  
12 detailed analysis that confirmed CRDM nozzles would  
13 continue to perform their intended pressure boundary  
14 functions through the end of PEO despite the wear.

15           The Westinghouse Owners Group then completed  
16 its analysis during that time. The applicant  
17 completed its own review and then provided to the  
18 staff a brief summary of these results in late  
19 November 2014, stating that the results of the  
20 analysis justified continued operation of the nozzles  
21 without inspections.

22           As a result of the staff's review at that  
23 time of the applicant analyses there were several  
24 communications that then commenced between the staff  
25 and the applicant over the period of December 2014

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1 through January 2015.

2 Consequently, the applicant amended its  
3 application and provided an enhancement to the ASME  
4 Section 11 in-service inspection program to include  
5 additional non-destructive examinations, or NDEs, of  
6 the five center most CRDM nozzles.

7 These were stated to be the most highly  
8 stressed and therefore the most susceptible locations.  
9 The applicant also stated that it would utilize a  
10 special ultrasonic testing probe for these inspections  
11 due to the narrow gap that was between the nozzle and  
12 the thermal sleeve and the applicant also added that  
13 the examination will use an increased water coupleant  
14 flow in order to obtain reliable ultrasonic readings  
15 from these nozzle areas. These examinations are to be  
16 performed for each unit prior to PEO and will be  
17 continued during each ISI period during the PEO.

18 The applicant provided details of its NDE  
19 procedures that it will implement in order to manage  
20 the CDRM nozzle wear. On the basis of the staff's  
21 evaluation of the detailed information that was  
22 provided and the NDE procedures that the applicant  
23 has, the applicant's response therefore in this open  
24 item has been closed.

25 Next slide. SER Section 4 contained the

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1 second open item involving environmentally assisted  
2 fatigue in Class 1 components. During the  
3 subcommittee, we presented that this second OI was  
4 related to questions on whether the most limiting  
5 leading location will be monitored for environmentally  
6 assisted fatigue, or EAF, of reactor coolant pressure  
7 boundary components.

8 The staff identified two issues in the  
9 applicant's reviews that determined the plant-specific  
10 leading locations to be monitored for EAF by the  
11 fatigue monitoring program. These issues were as  
12 follows.

13 Number one, the applicant did not adequately  
14 demonstrate that within a transient section the  
15 limiting location of one material could actually bound  
16 the locations fabricated from other different  
17 materials.

18 The staff requested additional justification  
19 as to why these locations of different materials would  
20 not need to be monitored for EAF.

21 The second issue was that while the  
22 applicant said it would screen out components with  
23 lower projected environmental cumulative usage  
24 factors, or CUF sub en, and more conservative  
25 assumptions, in contrast to that a location with one

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1 transient group was screened out which had a higher  
2 CUF sub en value versus the lead component's value.  
3 This seemed to be inconsistent with the methodology  
4 that was described in the application by the  
5 applicant.

6 So the staff laid out these issues in  
7 request for additional information and the staff and  
8 the applicant discussed these concerns over the period  
9 of October 2014 through February 2015.

10 Ultimately, the applicant proposed two  
11 resolutions to address these as follows. For issue  
12 number one, they would monitor the limiting locations  
13 for all materials in each transient group for EAF.  
14 And pertaining to issue number two, they provided  
15 specific refinements of the two locations which  
16 demonstrated and justified that the monitored location  
17 is indeed the most limiting component. And so this  
18 information I've supplied to the staff was sufficient  
19 to close the item. So this open item has been closed.

20 MEMBER SKILLMAN: John, let me be clear on  
21 what I understand. It appeared as though what the  
22 applicant - what Exelon did is identify and added  
23 three locations at all four units and it is the  
24 addition of those three locations at all four units  
25 that really provided the basis for closure of this

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1 open item. Is that accurate?

2 MR. DAILY: That's for the first one, yes,  
3 sir, Mr. Skillman. That was the extra components  
4 because they were of different materials than the  
5 actual original leading component.

6 So the first aspect, that was what closed  
7 it.

8 MEMBER SKILLMAN: Thank you. And the second  
9 aspect?

10 MR. DAILY: The second aspect, in evaluating  
11 the cumulative usage factors their methodology was to  
12 screen out lower values and take the higher value as  
13 a leading component.

14 But in one particular case, I believe that  
15 was in Unit 1 replacement steam generator transient  
16 group. That was actually - one component had a higher  
17 value that they screened out instead of screening out  
18 the lower ones.

19 And so the staff was concerned do you really  
20 have the right leading location, and by showing that  
21 the actual refinements in the calculation the  
22 applicant was able to demonstrate that the original  
23 component would indeed be the leading one and it would  
24 follow that way throughout. And so they were - they  
25 were acceptable as far as using that one and screening

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1 out originally the other one that had a fairly  
2 conservative to high value.

3 MEMBER SKILLMAN: Okay. Thank you, John.

4 MEMBER RICCARDELLA: This is probably for  
5 Al. About six months ago I think we had a  
6 presentation from research on a revised NUREG  
7 addressing environmentally assisted fatigue. Is this  
8 work being done in accordance with that or with the  
9 original NUREG?

10 MR. HISER: No, this is - this is - because  
11 the application is in accordance with GALL Rev. 2 and  
12 the new staff guidance has not been completed this is  
13 in accordance with GALL Rev. 2. So it would be the -  
14 all the information it predates that are a proposed  
15 draft reg guide.

16 MEMBER RICCARDELLA: My understanding is,  
17 though, that the new look at it is probably going to  
18 be less conservative than the original. So they  
19 shouldn't be a problem going forward, correct?

20 MR. HISER: Right. I think the - my  
21 understanding is these values would be reduced  
22 slightly so that they would not go higher with the new  
23 staff guidance.

24 MEMBER RICCARDELLA: Thank you.

25 MR. DAILY: Thank you. Next slide.

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1 MEMBER SKILLMAN: John, before you jump into  
2 a new topic, I would like to offer my assessment that  
3 the SER AMP count compared with what the licensees  
4 have identified are not the same number.

5 Kent and I went over the SER laboriously to  
6 reconcile the AMP count for insistent - consistent  
7 with exceptions and consistent with enhancements and  
8 I understand that the count that the SER provides and  
9 the count that Exelon provides are different at least  
10 by one because at least in one case the staff counts  
11 an AMP and Exelon does not. So I would like to get  
12 clear the AMP count issue and I'd like to get on the  
13 record if you believe that the SER was not accurate.

14 MR. DAILY: If you'll give us just a second,  
15 we do have a slide on that. Let me pull that up.

16 MEMBER SKILLMAN: And that is a serious  
17 issue for the ACRS because we are at the mercy of the  
18 SER for our review and if there is an error in the SER  
19 it has a great impact on the amount of resources we  
20 use to come to a conclusion.

21 MR. DAILY: That's actually a good question  
22 and I'm glad you brought it up. Let me explain what  
23 we went through. Since the SER had been published one  
24 of the other things that we do, of course, is we  
25 continually go back and cross check things and in

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1 working on this particular portion we did discover a  
2 couple places in the SER where we need to make a  
3 correction.

4 Those corrections will be added into the  
5 final NUREG depicting the status of the Aging  
6 Management Programs. What we do in the SER, first of  
7 all, the application as tendered to the agency  
8 contained one list of Aging Management Programs.

9 And so those Aging Management Programs 44 of  
10 them apply to both stations. One of them is unique to  
11 Byron station and, of course, Exelon had already  
12 talked about that.

13 In addition, several enhancements or  
14 exceptions may apply to only one station versus the  
15 other and so there may be a breakdown like that. But  
16 irrespective of those uniquenesses, there's one set of  
17 Aging Management Programs just as Byron and Braidwood  
18 have one combined UFSAR updated final safety analysis  
19 report.

20 However, in looking at those programs, of  
21 course, we typically try to characterize them as to  
22 how many are new, how many have enhancements, how many  
23 are consistent with the GALL report and so forth.

24 So whereas Exelon showed you how that  
25 universe of Aging Management Programs would apply to

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1 the individual stations, the staff in its disposition  
2 looked at them as far as how are they - as far as  
3 consistent with the GALL report or not.

4 And in working with and comparing with the  
5 applicant and also working with Kent Howard, we were  
6 able to clarify that under the staff disposition if  
7 you look at the numbers over there in terms of the new  
8 programs and the existing programs there are two new  
9 programs that have exceptions and there are, if I can  
10 add them up, eight programs that have exceptions or,  
11 in some cases, enhancements and exceptions.

12 So whereas Byron and Braidwood, under  
13 Exelon's accounting had either eight or nine, we were  
14 looking at ten total. Now, what that means is, of  
15 course, one of them was unique to Byron and so  
16 Braidwood has a slightly different number.

17 But the one difference between the way  
18 Exelon was accounting for exceptions and the way the  
19 staff accounted for the - involved the fire water  
20 system Aging Management Program.

21 In that particular system, we had written  
22 some interim staff guidelines that referenced NFPA  
23 codes. I believe NFPA code 25 is the applicable one  
24 for fire protection.

25 Exelon, in their integration of that ISG

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1 into their AMP, took exception to some of the  
2 requirements or some of the recommendations of the  
3 NFPA program.

4 The staff reviewed those exceptions and  
5 found them to be acceptable and so in the staff's mind  
6 that constituted an Aging Management Program with an  
7 exception. And so in that case we're actually  
8 counting one more than Exelon does in considering that  
9 an Aging Management Program is consistent with  
10 exceptions.

11 So I think once the dust has settled here I  
12 think what we'll find is that's really the only  
13 difference and it's an administrative or accounting  
14 difference. The context and the text and the  
15 agreement as far as what needs to be done in both  
16 cases is the same.

17 MEMBER SKILLMAN: My response is I generally  
18 concur with what you have just said but the slide that  
19 you show is appropriate for one plant but not for both  
20 plants, or let me be more specific.

21 You actually have four units and you have  
22 two that have one set of AMPs and you have two that  
23 has a different set of AMPs and you do the count you  
24 realize that Byron and Braidwood are not identical.

25 I would also agree that if you subtract fire

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1 water system, the count that we believe should be  
2 there and the Exelon count come out the same. What I  
3 would like to achieve is sometime between now and  
4 approximately this time tomorrow morning your numbers  
5 and the numbers that we believe are accurate are the  
6 same number and that number finds its way into the  
7 SER.

8 MR. DAILY: I believe we can do that.

9 MEMBER SKILLMAN: Because I want - I want  
10 our letter to reflect an accurate SER count including  
11 the change in the exception for fire protection.

12 MR. DAILY: And those numbers are what we  
13 have on the screen right now this morning. The one  
14 thing that I would say, and I believe I can say this  
15 on the record, there is one set of Aging Management  
16 Programs and that's the way the staff reviewed them.

17 The applicability of those programs to the  
18 four units, as you say, in the two sites is laid out  
19 in the safety evaluation report.

20 So we did not consider, except for the one  
21 which is Byron station only, we did not consider an  
22 AMP as being a Braidwood AMP or a Byron AMP. It is a  
23 Byron-Braidwood, and in this, this is a unique case -  
24 a dual application.

25 MEMBER SKILLMAN: I understand.

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1 MR. DAILY: That's how it was presented.

2 MEMBER SKILLMAN: And I would also offer it  
3 is complicated because it is an issue of fine detail  
4 and it's almost an issue - one could consider it an  
5 issue of trivia but it's not.

6 It is important that what we communicate as  
7 an acceptable application and what you communicate as  
8 the SER for that application are in full agreement.

9 MR. DAILY: I would agree with that. It is,  
10 and -

11 MEMBER SKILLMAN: I don't want to be picky  
12 picky but I want to be accurate.

13 CHAIRMAN STETKAR: I want to amplify that on  
14 that - for the record, the ACRS doesn't particularly  
15 care how the applicant or the staff has conveniently  
16 or inconveniently bundled things together for  
17 expedience. The ACRS needs to make findings of safety  
18 on an individual unit by unit basis, not a bundled  
19 basis.

20 So it's really important for us to make sure  
21 that we understand from a technical perspective  
22 whether the Aging Management Programs for each of  
23 those four individual units, which is the way we must  
24 make our findings, are applicable and indeed that the  
25 scope is comprehensive for each one.

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1           How people bundle things together for  
2 expedience of writing reports is not particularly  
3 relevant to us.

4           So I echoed Dick's concerns here that  
5 although this might sound like a really trivial minor  
6 detail of body count, it reflects what we were trying  
7 to do in our review is to understand what differences  
8 there are among the four units and whether or not the  
9 applied Aging Management Programs for each of those  
10 units are appropriate.

11           And these differences in the body counts, as  
12 I tend to call them, are indicative of perhaps over  
13 reliance on the expedience of bundling things  
14 together.

15           So that's really the underlying tone of our  
16 larger issue in terms of counting up these various  
17 numbers about, you know, how many apply and whether  
18 they apply to all and which ones are new and all of  
19 those exceptions.

20           We, in our final finding, need to make a  
21 finding on each of the four units and make sure that  
22 there's adequate places for that.

23           So that's sort of the underlying tone of  
24 this, although it's kind of presented in this  
25 numerical body count, if you will, approach to -

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1 MR. DAILY: You're right, and Mr. Chairman,  
2 that's a consideration that we had first identified  
3 even before the application came in and our talks with  
4 Exelon.

5 A dual-site application - in our history  
6 there have only been four other ones dating back to  
7 the last one that was truly a dual-site application  
8 back in the early 2000s with Dresden and Quad Cities.  
9 Catawba McGuire was another one.

10 And so we actually put together a team to  
11 evaluate what were we going to do when a dual-site  
12 application came in and we looked at all various ways  
13 of should it be divided, should it be two separate  
14 SERs and so forth.

15 And the conclusion that we came to was to  
16 make sure that we had clear delineations throughout  
17 the text as to what applies to where because you're  
18 absolutely right, there are four separate licenses  
19 under consideration here and each one needs to be able  
20 to stand, you know, on its - on its merits.

21 And so these numbers are just as important  
22 to us as they are to you and to be accurate and that's  
23 why if there's an error to correct, you know, the  
24 facts are the way they are and we want them to be as  
25 accurate - to accurately reflect, you know, what's

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1 really out there and then, again, so that we can give  
2 an accurate picture to the committee.

3 MEMBER SKILLMAN: I thank our chairman for  
4 his comments. I would just make one further comment.  
5 To those who think that the ACRS effort is somewhat  
6 cosmetic and that we don't use a thick magnifying  
7 glass, I hope that this discussion might dispel that.

8 We are really looking at each and every  
9 piece of these documents so as to make sure we have  
10 fulfilled our role in protecting to the extent that we  
11 are responsible for health and safety of the public.

12 MR. DAILY: And that's - we're very much in  
13 agreement with that.

14 MEMBER SKILLMAN: And so I think there's an  
15 action here. I think you and Kent need to spend some  
16 time with the numbers and make sure that your count -  
17 your SER count and what we believe is the right count  
18 are aligned and so that's something that needs to be  
19 done in the next 24 hours.

20 MR. DAILY: We'll take care of that.

21 MEMBER SKILLMAN: Yes, sir. Thank you.  
22 Now, I interrupted you.

23 MEMBER RAY: Wait. I had a question on this  
24 point.

25 MEMBER SKILLMAN: Go ahead.

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1           MEMBER RAY: I take it that by definition  
2 compliance with interim staff guidance is the plant  
3 exception to the GALL report because there's lots of  
4 outstanding ISG.

5           MR. DAILY: Yes, sir. That would be  
6 correct, because the ISG is a mechanism of updating  
7 the GALL report itself.

8           MEMBER RAY: Well, lots of times it's  
9 described as providing for enhancements. Enhancements  
10 are not exceptions, of course. I'm saying that as a  
11 question, actually. Exceptions are exceptions.  
12 Compliance with an ISG that calls for enhancements,  
13 that's not the same thing as an exception.

14           MR. HISER: No. An exception means that the  
15 GALL AMP, be it in Rev. 2 of GALL or incorporated  
16 through an ISG that a plant program does not meet some  
17 element of that.

18           MEMBER RAY: Yeah. No, I just want to be  
19 clear. I assumed that but I wanted to be explicit  
20 because the commitments so - capture so many  
21 enhancements that are really a product of the ISG  
22 being applied subsequent to Rev. 2 of the GALL report.

23           MR. DAILY: Well, an enhancement actually is  
24 when an applicant needs to take an existing program  
25 and add things to it in order to become consistent.

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1           So you're correct, in which case an ISG or  
2           a GALL report AMP may - under consideration the  
3           applicant may want to enhance its existing program to  
4           meet a consistency level and that's why that would be  
5           called an enhancement.

6           Dr. Hiser explained if there is a  
7           recommendation in the GALL report and the applicant  
8           does not intend to do that recommendation but to do  
9           something alternatively, that becomes an exception and  
10          the staff needs to review that to find out if that's  
11          acceptable.

12          MR. HISER: An enhancement could occur if  
13          the plant program was consistent with GALL Rev. 2  
14          through an ISG additional guidance was added that the  
15          plant program did not need and then they identified  
16          that they needed to enhance their program to meet  
17          that.

18          MEMBER RAY: No, I understand. I was just  
19          looking at the category here in the Exelon report of  
20          enhanced consistent with GALL that includes  
21          enhancements to the AMP that will be pursuant to the  
22          ISG. Maybe they've already been made. But for the  
23          most part, commitments reflect ones that haven't yet  
24          been made.

25          MR. DAILY: And Exelon may want to speak to

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1 that but in general when they characterize a program  
2 as consistent with the GALL report I believe they were  
3 rolling in the fact that enhancements were part of  
4 that factor.

5 MEMBER SKILLMAN: Or for the numbers to  
6 match that would have to be the case.

7 MEMBER RAY: Or - yeah, or compliance with  
8 the ISG whether involved in enhancement not yet  
9 incorporated or not.

10 MR. DAILY: Yes. Yes.

11 MEMBER RAY: Okay. All right. Thanks.

12 MEMBER SKILLMAN: As I said, I interrupted  
13 you. You had completed open items. I asked you to  
14 please explain AMPs. Now we're up to closure studs.

15 MR. DAILY: Yes.

16 MEMBER SKILLMAN: Your slide 7.

17 MR. DAILY: Slide number - let's say, 6, I  
18 believe. Slide 6. Yep, 6.

19 Good. Slide number 6, closure stud update.  
20 As we reported during the subcommittee meeting, Byron  
21 Unit 2 reactor vessel had - closure stud number 11 had  
22 become stuck in 2010 with insufficient thread  
23 engagement to be tension.

24 The applicant decided to abandon the stuck  
25 stud in place after cutting approximately five inches

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1 from the top end of it to facilitate tensioning of the  
2 adjacent studs.

3 As a result, the remaining portion of stud  
4 number 11 and its flange hole were exposed to borated  
5 water during refueling outages and were inoperable.  
6 The applicant had proposed a commitment to remove the  
7 stud, inspect the threads and repair them as needed  
8 before the period of extended operation begins.

9 By a letter dated January 23rd, 2015, the  
10 applicant provided an update on the completion of this  
11 commitment. So that was about a month and a half  
12 after the subcommittee meeting.

13 The applicant stated that the Byron Unit 2  
14 stuck stud number 11 was removed during the fall 2014  
15 refueling outage. It also stated that the stud hole  
16 was clean and that it found no signs of thread damage  
17 on the stud or the flange hole threads.

18 The applicant further stated that the stud  
19 hole was evaluated and determined to be acceptable for  
20 us after minor clean-up. Applicant stated that it  
21 installed a new stud at this location and therefore  
22 its commitment was completed.

23 Now, the staff from Region 3 documented a  
24 review of this work in its inspection report number  
25 2014-005 for Byron station. Based on this

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1 information, the staff considers this commitment  
2 completed and the vessel had closure stud for Byron as  
3 being restored.

4 Next slide. For Braidwood Unit 2, as we'd  
5 reported during the subcommittee meeting, this unit  
6 also has an inoperable stud at location number 35. We  
7 reported that Unit 2 stud 35 had become stuck in 1991.

8 The stud had enough threat engagement  
9 available at that time and was full tensioned during  
10 operations until May of 1994 when the stud was cut at  
11 the flange level to facilitate fuel movement  
12 activities.

13 In 2002, the applicant initiated repair  
14 activities in an effort to restore operability. The  
15 remnant of the stuck stud was bored out. However,  
16 during machining operations on the flange stud hole,  
17 the top portion was slightly overboard due to an  
18 error.

19 Further efforts to restore the threads to  
20 stud hole number 35 were then suspended, and as a  
21 result, since 2002 Braidwood Unit 2 stud hole number  
22 35 had been inoperable and is subject to borated water  
23 exposure during the fueling outages.

24 The applicant has proposed a commitment to  
25 repair this stud location before PEO, stating that

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1 "Braidwood Unit 2 reactor had closure stud location 35  
2 will be repaired so that all 54 reactor head closure  
3 studs are tensioned during the period of extended  
4 operation."

5 The staff has proposed to elevate this  
6 commitment into a licensed condition so that all 54  
7 closure studs can be tensioned during the period of  
8 extended operation.

9 The staff concluded that with the  
10 implementation of this as a licensed condition and the  
11 full restoration of Braidwood number two reactor  
12 vessel stud hold location 35, the program will then be  
13 adequate to manage applicable effects of aging and  
14 maintaining intended functions consistent with its  
15 currently licensing basis for the period of extended  
16 operation.

17 Next slide. Also, as presented to the ACRS  
18 subcommittee meeting back in December, three issues  
19 were identified as a result of the 71002 inspection  
20 which were performed in support of license renewal by  
21 Region 3. This was completed in November of 2014.

22 These issues were presented in the  
23 inspection report and initially discussed with the  
24 subcommittee. However, at that time they were not all  
25 fully resolved. So today we want to represent the

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1 issues and updates and provide the resolution of these  
2 to the committee.

3 Next slide. So the first issue from the  
4 71002 inspection came in response to some staff  
5 questions. The applicant revised its license renewal  
6 application to include the CRDM seismic support  
7 assemblies within the scope of license renewal and  
8 included the components in the appropriate AMR tables.

9 However, the applicant did not identify  
10 whether high strength bolting, particularly high  
11 strength bolting greater than one inch in diameter,  
12 was a part of the supports.

13 By letter dated October 16th, 2014, the  
14 applicant had responded to a staff REI and stated that  
15 there were no high strength bolts in sizes greater  
16 than one inch used in the CRDM seismic supports.

17 Based on the staff's review then of this  
18 information supplied, this was sufficient to address  
19 the staff's concern and so this resolved the issue.

20 Next slide. Issue number two was the visual  
21 examinations of containment concrete and this applies  
22 to the Aging Management Program of the ASME Section 11  
23 IWL program.

24 And this involved the applicant's procedure  
25 for performing visual inspections of external surfaces

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1 for concrete deterioration. These were - some of  
2 these inspections are performed remotely with the use  
3 of an optical aid.

4 The inspection team was concerned that the  
5 visual resolution capability of this method would not  
6 adequately quantify relevant findings based upon  
7 quantitative acceptance criteria described in Chapter  
8 5 of ACI Standard 349.3R. The issue applied to both  
9 Byron and Braidwood stations.

10 As discussed during the subcommittee, the  
11 staff had issued an REI in early November shortly  
12 before the subcommittee meeting, requesting that the  
13 applicant provide verification that sufficient  
14 resolution capability would be used during these  
15 visual examinations and to be able to quantify any  
16 relevant findings for comparison against the  
17 acceptance criteria in the ACI standard.

18 The applicant provided its response to the  
19 REI in late November of 2014, again, shortly before  
20 the subcommittee meeting and at that meeting we stated  
21 that the staff was still reviewing this information.

22 The results of the review, after going  
23 through the response, the applicant enhanced the  
24 program to ensure that adequate visual resolution  
25 would be used for the remove visual examinations.

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1           The staff found this response acceptable  
2 because with the enhancements the inspections would  
3 have visual resolution capability that adds three  
4 things, basically - that it'll be demonstrated to be  
5 equivalent to a direct visual examination, that it  
6 will be able to detect and quantify concrete  
7 degradation consistent with the acceptance criteria in  
8 the ACI standard 349.3R and that it will be confirmed  
9 by a qualified professional engineer.

10           This information then as provided to the  
11 staff was sufficient to resolve the concern and so  
12 there - this item is closed.

13           Next slide. This next item on the flex  
14 thimble tube inspection AMP was briefly discussed in  
15 the subcommittee meeting although this arose after the  
16 SER with open items was issued.

17           The staff's initial review - by way of  
18 background the initial review of the flux thimble  
19 tubes inspection program in the LRA had resulted in  
20 REIs back in May of 2014 requesting in part more  
21 information on some higher than expected wear rates  
22 that were identified in in-core flux thimble tubes at  
23 Braidwood and staff was concerned about the adequacy  
24 of the AMP because all the flux thimble tubes had not  
25 been inspected for various reasons.

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1           The applicant's response in June of 2014  
2 discussed these high wear rate issues and the failures  
3 to obtain data specifically during the time period of  
4 2007 to around 2012 for both Byron - excuse me,  
5 Braidwood Units 1 and 2.

6           The applicant also initiated several  
7 corrective actions related to completing eddy current  
8 examinations. One corrective action was to increase  
9 the inspection frequency to perform examinations every  
10 outage.

11           The staff closed its evaluation at that time  
12 based on the applicant's response and documented this  
13 in the SER with open items in October of 2014.

14           Subsequent to obtaining these resolutions,  
15 however, during the performance of the 71002 license  
16 renewal inspection the staff discovered significant  
17 new operating experience.

18           The inspection revealed that the applicant  
19 had had several more difficulties recently in  
20 obtaining data. At Braidwood Unit 1, this was in 2012  
21 when it obtained data from only 16 of 58 tubes and  
22 then data from zero of 58 for Unit 1 during September  
23 2013.

24           As for Braidwood Unit 2, it had obtained 28  
25 of 58 tubes in 2012 and then eight of 58 tubes during

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1 May 2014. Next slide.

2 So then based on this new information the  
3 staff had some additional concerns that the  
4 applicant's flux thimble tube inspection program at  
5 Braidwood might not be adequate if the planned  
6 inspections were not able to be performed as expected,  
7 and without the data, of course, the staff was  
8 concerned that the program would not be able to  
9 adequately monitor or trend the wear. Therefore, the  
10 program would not be able to manage aging effects.

11 So the staff reviews and applicant responses  
12 then continued over the period of November 2014  
13 through April of 2015. Examples of these concerns are  
14 shown here on the slide, which the staff and the  
15 applicant discussed in some detail over this time  
16 frame.

17 The staff noted that the program at  
18 Braidwood has had several problems performing  
19 inspections or obtaining usable data and the staff's  
20 concerns that efforts to correct these issues did not  
21 appear to be effective.

22 Also, the staff noted indications where the  
23 problems seem to be occurring at an increasing rate  
24 over this period of 2010 or 2012 to 2015.

25 Next slide. In terms of final resolutions

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1 for this program the applicant had proposed to enhance  
2 its program in three particular ways. Number one,  
3 specific tubes for Units 1 and 2 that have exhibited  
4 wear during eddy current testing would be replaced,  
5 removed from service or will have successful eddy  
6 current testing at the next refueling outage.

7 All remaining tubes would then be replaced  
8 or removed from service at the next follow-up  
9 refueling outage unless the eddy current testing is  
10 obtained under the program.

11 On number two, the applicant proposed to  
12 inspect every flux thimble tube, every refueling  
13 outage until sufficient data is accumulated to justify  
14 a plant-specific eddy current testing frequency.

15 Number three, the applicant will replace or  
16 remove from service any thimble tube after two cycles  
17 if eddy current data are not obtained.

18 Based on the final resolutions and  
19 evaluation of this information submitted by the  
20 applicant and with the additional consideration that  
21 the staff deems these actions necessary to adequately  
22 maintain reactor coolant pressure boundary for  
23 Braidwood, the flux thimble tube inspections the staff  
24 will propose to elevate this commitment for Braidwood  
25 into a licensed condition in each of the Unit 1 and

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1 Unit 2's renewed license with one clarification, as  
2 we'll mention here in a moment.

3 Number one, the license condition will  
4 retain the commitment on replacement and removing from  
5 service indicated tubes for each unit unless  
6 successful data is obtained as described by Exelon and  
7 it's commitment number 24.

8 Number two, and this is where the  
9 modification comes in, the inspection requirement  
10 would be modified to simply state that all tubes shall  
11 be inspected at at least every two refueling outages  
12 at that frequency.

13 To clarify this, since under this proposed  
14 licensed condition no thimble tube would remain in  
15 service more than two fuel cycles without successful  
16 data being obtained.

17 The staff concludes that an inspection at  
18 that tube refueling outage frequency is sufficient for  
19 the inspection frequency as compared to the  
20 applicant's proposal, which was to perform at every  
21 outage.

22 No tube will remain - this is number three -  
23 no tube will remain in service more than two cycles  
24 without successful data being obtained.

25 As a result and with the license condition

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1 as noted, the staff concludes that the AMP's  
2 implementation in this manner would be adequate for  
3 managing the effects of aging for the subject  
4 components so that all the unintended functions would  
5 be maintained consistent with the current licensing  
6 basis for the period of extended operation. And so  
7 this then would resolve - this particular item from  
8 71002 inspection closes the issue.

9 Next slide. In conclusion, on the basis of  
10 this review, the staff concludes that the requirements  
11 of 10 CFR 54.29(a) have been met for the renewal of  
12 licenses for Byron Station Units 1 and 2 and Braidwood  
13 Station Units 1 and 2.

14 This concludes now the staff presentation  
15 and we'll be available now for any other questions  
16 that the committee might have.

17 Thank you.

18 MEMBER SKILLMAN: John, staff, thank you.  
19 Colleagues, any questions for DRL team? So with that,  
20 John, I'm going to turn this back to you.

21 CHAIRMAN STETKAR: A couple of  
22 administrative things. Are there - can we get the  
23 bridge line up? Is there anybody on the bridge line,  
24 Karen?

25 Are there any members of the public in the

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1 room who'd like to make any comments? If there are,  
2 I'd ask you to step up to the microphone and do so.  
3 We'll try to keep the bridge line open. Sounds like  
4 it's open. Good.

5 If there's someone out there because of our  
6 very high technology system here, if you're on the  
7 bridge line could you just please say hello so that we  
8 can confirm that it's actually open.

9 Thank you. Thank you. That's good enough.  
10 Thank you very much. That's the only way actually we  
11 can confirm it's open. Now that it's open, is there  
12 any member of the public or anyone out there on the  
13 bridge line who'd like to make any comments regarding  
14 this license renewal?

15 If none, we will reclose the bridge line.  
16 And again, I'd like to thank Exelon and the staff for  
17 an excellent presentation - good coverage. We have a  
18 little bit follow-up clean-up work to do between now  
19 and tomorrow.

20 With that, we will recess our meeting and go  
21 off the record until 1 p.m. this afternoon.

22 (Whereupon, the above-entitled matter  
23 recessed at 9:50 a.m. and resumed at 1:02 p.m.)

24 CHAIRMAN STETKAR: The meeting is back in  
25 session and the topic that we'll be addressing next is

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1 interim staff guidance for assessing the technical  
2 adequacy of probabilistic risk assessment for the  
3 advanced light water reactor. And Dr. Dennis Bley  
4 will be the - Dennis, it's yours.

5 VICE CHAIR BLEY: Just going to pass it on  
6 to Donnie Harrison to give us the briefing and then  
7 we'll hear from NEI later.

8 MR. HARRISON: Thank you. Again, I'm Donnie  
9 Harrison. I'm in the Office of New Reactors, the  
10 division of risk and safety systems analysis or  
11 something like that, right?

12 CHAIRMAN STETKAR: You look unsure.

13 MR. HARRISON: Yeah, well, I always get  
14 confused on what the rate stands for.

15 MEMBER POWERS: The rate, it changes. A  
16 little bit of uncertainty, though, is understandable.

17 MR. HARRISON: I need to document my  
18 assumptions. What I'm going to go over today is this  
19 interim staff guidance 028. Again, with the long  
20 title here it's for design cert applications and  
21 combined license applications.

22 Last year, we had a presentation meeting  
23 with the ACRS subcommittee. Again, it's risk and  
24 reliability or something like that, and we got a  
25 discussion at that point before we actually send the

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1 ISG out as a draft or use and comment last year.

2 We got comments on the - on the ISG from the  
3 industry. We addressed those comments. We also  
4 looked back at comments we had from the ACRS members  
5 during that subcommittee.

6 We had a subcommittee meeting August 21st of  
7 this year to look at the final ISG. We had some  
8 takeaway from that meeting that I'm going to talk  
9 about today as well and so this brings it up to the  
10 full committee to kind of what the purpose was and  
11 where we're at currently with that.

12 So the presentation outline is I want to  
13 give you a brief background, purpose and scope of the  
14 ISG. I'll go over the general topics that addresses  
15 some of the technical challenges you have, looking at  
16 the current PRA standard when you apply it to a design  
17 or a license applicant in the preoperational phase.

18 I'll briefly talk about how we did our  
19 evaluation of the supporting requirements in the PRA  
20 standard, the summary of comments that we received  
21 from the industry and how we dispositioned those at a  
22 high level.

23 I want to focus in on three specific  
24 takeaways we had from the ACRS subcommittee and how  
25 we're considering those topics going forward and then,

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1 finally, the next steps of what we're going to do  
2 moving forward with the final ISG.

3 So the background. The PRA standard, the  
4 current version that we endorse is Addendum A of the  
5 ASME/ANS standard. It's endorsed in Reg. Guide 1.200  
6 Revision 2.

7 It was developed based on current operating  
8 plants. It establishes high level requirements and  
9 then under the high level requirements for each  
10 technical element it has individual supporting  
11 requirements on what is the aspects of what a PRA  
12 contains.

13 It doesn't get into methods or how to do it.  
14 It just tells you what should be addressed. It  
15 currently addresses internal events at power - at full  
16 power internal events, external hazards framework. So  
17 it doesn't address, like, things like will power and  
18 shut down currently.

19 It also does not specifically address  
20 advance site water reactor designs like passive  
21 systems, though one could probably use the standard  
22 language for the most part to address those systems.

23 It doesn't address Part 52 licensing asked  
24 about in the preoperational phase and it doesn't  
25 address the term large release frequency, which is the

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1 metric that you use for design certs and combined  
2 license applicants, and we'll get into the fact that  
3 it uses large early release frequency and so large  
4 release frequency.

5 VICE CHAIR BLEY: Donnie, I've forgotten.  
6 What's the status of the low power shut down standard?  
7 I thought it -

8 MR. HARRISON: The low power shut down  
9 standard in the industry went out for - I think it's  
10 for trial use right now.

11 VICE CHAIR BLEY: Okay.

12 MR. HARRISON: There's a, if you will, a  
13 strategy the NRC will be using as some of these  
14 standards come out for trial use that we're going to  
15 start to develop a draft revision to the Reg. Guide to  
16 address those and then at some point when the trial  
17 use period ends it will all come together and the Reg.  
18 Guide will be updated to reflect whatever change  
19 during that trial use period. So that's a separate  
20 pathway going forward.

21 VICE CHAIR BLEY: Okay. Thanks.

22 CHAIRMAN STETKAR: Donnie, when you say the  
23 ISG doesn't specifically address preoperational phases  
24 the 52 licensing -

25 MR. HARRISON: That's the standard - the PRA

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1 standard doesn't -

2 CHAIRMAN STETKAR: Oh, PRA standard. I'm  
3 sorry.

4 MR. HARRISON: Yeah. I'm sorry. This isn't  
5 -

6 CHAIRMAN STETKAR: I was in the wrong - I'm  
7 sorry. Never mind. If I - if I read the slide I  
8 would have understood that. Never mind.

9 MR. HARRISON: Okay. So the purpose of the  
10 ISG is to provide a consistent consideration of the  
11 PRA standard for those part 52 design cert and COL  
12 applicants in addressing the adequacy of the PRA for  
13 those applications.

14 It, basically, is a supplement to the Reg.  
15 Guide 1.200 for those, which is currently focused on  
16 current operating reactors and eventually it will be  
17 incorporated as appropriate into either Reg. Guide  
18 1.200, which is the technical IFC Reg. Guide, Reg.  
19 Guide 1.206, which is what's needed for a COL  
20 application content format kind of guide and then the  
21 SRP 19 is, again, the COL guide - designs for COL  
22 guidance.

23 And, again, it will also probably - this  
24 last bullet on here needs to be updated once they get  
25 to that next edition of the PRA standard. So all

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1 these things that go out for trial use, at some point,  
2 will have to catch up.

3 They're going to - the standards community  
4 will issue a next edition and all these Reg. Guides,  
5 especially 1.200, will have to catch up to it at that  
6 point.

7 MEMBER SKILLMAN: Donnie, let me ask this  
8 question. Appendix 8 of Part 52 already has a couple  
9 of certs. How are those treated since they are  
10 already certified designs?

11 MR. HARRISON: The certified designs - and  
12 again, this is - in the past when we did those reviews  
13 we addressed - the staff had to address or the  
14 applicant had to address if their PRA was good enough  
15 for the application.

16 In the old days, back then you had detailed  
17 reviews and we had the actual PRA models that were  
18 reviewed. So -

19 MEMBER SKILLMAN: Excuse me. Say again  
20 please.

21 MR. HARRISON: Okay. In - if you go back 20  
22 years when, like, the ABWR was licensed and now, if it  
23 comes back for a renewal of its license - of its  
24 design cert, those PRA reviews we actually have the  
25 models.

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1           We did detailed reviews of the models to  
2 determine the adequacy of the PRA for those  
3 certifications. So this doesn't go back and change  
4 that.

5           MEMBER SKILLMAN: So they're grandfathered,  
6 virtually?

7           MR. HARRISON: They are - this is going to  
8 help, going forward, gain consistency, yeah. So what  
9 we did in the past we're not revisiting that.

10          MEMBER SKILLMAN: Okay. Thank you. I was  
11 just curious.

12          CHAIRMAN STETKAR: Just for the record,  
13 Donnie, you didn't do detailed reviews of those PRAs.  
14 You did selective audits of parts of the models.

15          MR. HARRISON: Fair enough. It depends on -  
16 yeah, in some areas they were detailed and in some  
17 areas they weren't, right. Certain areas you drove  
18 down into and other areas you didn't. That's a fair  
19 problem.

20          VICE CHAIR BLEY: And just for information  
21 for our members, even the certified designs if new  
22 COLs come forward this will apply?

23          MR. HARRISON: That would apply to them,  
24 yes.

25          VICE CHAIR BLEY: And before they load fuel

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1 they have to do a complete full scope PRA that will  
2 come under 1.200?

3 MR. HARRISON: Correct.

4 MEMBER POWERS: Where it's understood that  
5 full scope is whatever the current definition of full  
6 scope is -

7 CHAIRMAN STETKAR: That will address all  
8 operating mode, all hazards, according to the  
9 standards and guidance that are in place one year  
10 prior to loading the fuel, in particular.

11 MR. HARRISON: Right. Right. Yeah, that  
12 are endorsed standards, right. And right now the  
13 endorsed standard only addresses full power so that -  
14 that's where we are today.

15 If someone were to be a year away from fuel  
16 load they would - that PRA would only have to address  
17 full power operations. We have things where we look  
18 at low power and -

19 CHAIRMAN STETKAR: The PRA that endorses the  
20 regulations require that the PRA does endorse low  
21 power and shut down modes.

22 MR. HARRISON: Well, there's a - there's a -

23 CHAIRMAN STETKAR: Addresses it.

24 MR. HARRISON: Addresses it, and again we -

25 CHAIRMAN STETKAR: So you can't ignore low

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1 power and shut downs simply because there isn't a  
2 standard nor can even design certifications ignore it.  
3 They do address it to a greater or lesser extent.

4 MR. HARRISON: Correct.

5 CHAIRMAN STETKAR: The only thing that they  
6 don't they're allowed and to design certification  
7 stage, and we'll have more discussion about this a  
8 little bit later, is they're allowed to use the  
9 seismic margins analysis and I can't recall whether  
10 the word simplified prior analysis exists but  
11 certainly seismic - a seismic margin approach at the  
12 design certification stage.

13 MR. HARRISON: And the last point here is  
14 there's a similar effort going on within the ASME/ANS  
15 standard community to look at events like water  
16 reactors and develop some guidance within the PRA  
17 standard community.

18 So that's also going on kind of in parallel  
19 to what we're doing on a longer time line than we are.  
20 So it's coming together. I was just in New York on  
21 that committee. Was that last week? Yeah. Wow.  
22 Okay.

23 The scope of the ISG, again, it's the PRA  
24 required for the design cert application, the COL  
25 application per the cited regulations in this - in the

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1 first set of bullets.

2 It's not for the PRA for a combined license  
3 holder that's under the 50.71(h) requirements which  
4 was the way the fuel load requirements.

5 It's not meant to be used for risk-informed  
6 applications like risk-informing ISI, in-service  
7 inspection or technical specifications or any of those  
8 things.

9 In those cases, it's expected that the  
10 applicant would apply the current standard and address  
11 the current endorsed standard including where they  
12 couldn't meet certain requirements because of their  
13 status in the operational phase.

14 The other point is we also - when we did  
15 this we looked at only the typical - what we believe  
16 were the typical conditions that we expected to see.

17 We didn't address every conceivable option  
18 of would you have a reference and a subsequent COL  
19 that were years enough apart where the subsequent COL  
20 could leverage the represent COL's data.

21 We didn't try to figure out at all the  
22 different nuances one might experience. Sometimes we  
23 wrote a clarification to express some of that but we  
24 didn't explicitly try to address every option out  
25 there.

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1           And pulling it together, there were these  
2 six general topics that we addressed in the front part  
3 of the ISG. The ISG has about 20 pages of text and  
4 then about 80 to 90 pages of tables that starts to go  
5 item by item in the standard.

6           In that 20 pages these topics are discussed.  
7 So it's scope and capability of the PRA - PRA  
8 configuration control. The peer reviews are self  
9 assessments, operational guidance and practices, large  
10 release frequency and then what I call technical  
11 challenges you have just from the fact that you're in  
12 the preoperational phase.

13           I don't plan on going into this in detail.  
14 However, just at a high level scope and capability,  
15 again, was established this is only for the design  
16 cert and COL applications.

17           The staff separately in other places has  
18 said that meeting the high level requirements is  
19 generally acceptable and addressing capability  
20 category one within the standard is generally  
21 acceptable. There are some exceptions.

22           That's a topic from the ACRS and I'm going  
23 to get to that towards the end of the presentation  
24 about what we did with - based on the comments we got  
25 from the ACRS members in that area.

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1 PRA configuration control is just a  
2 recognition that you - when you read the standard it  
3 talks about reflecting the as-built as-operated plant.  
4 Obviously, when you're in design cert or combined  
5 license application phase you haven't built the plant  
6 yet so it's recognized that those things are - as to  
7 be designs as to be built, as to be operated,  
8 considerations that you need to take into account.

9 And that leads you into a place of as you  
10 iterate with the design, tracking what areas does your  
11 PRA not reflect what your current design looks like.  
12 And so that's, again, a configuration control on your  
13 PRA to makes sure you recognize where it matches or  
14 doesn't match the current design and address that.

15 So they're required to have that kind of  
16 configuration control. For peer review self-  
17 assessments, if you read the guidance on peer reviews,  
18 it talks about the peer reviewer has to be essentially  
19 intimately knowledgeable of the design.

20 In some cases, especially if it's unique  
21 design features, they may not have that intimate  
22 design. They may have the general understanding and  
23 oftentimes the applicants will refer to doing self-  
24 assessments instead.

25 Those are ways to try to gain confidence

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1 that the PRA is adequate for the application. We  
2 recognize you can do that and you need to document  
3 where the peer reviewers either couldn't review  
4 something or were making assumptions on their own  
5 based on that so that you can track where maybe you  
6 need to do a future peer review as you get more  
7 information.

8 I always think of design certs where you  
9 have decisions about your ultimate heat sink and you  
10 don't know if you're going to be building this design  
11 on the ocean or on the river or have cooling towers.  
12 Those things become - can become important depending  
13 on your design.

14 And so they will need to make assumptions  
15 and then the peer reviewers will need to kind of  
16 review it to see if they agree or if there's something  
17 missing.

18 Operational guidance and practices, this  
19 also shows up as a technical challenge. The PRA  
20 standard was written assuming current operating  
21 plants.

22 Therefore, they always talk about, you know,  
23 abnormal operating procedures, emergency operating  
24 procedures, actual data and that type of thing and  
25 they know the practices of how they align systems and

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1 which systems during standby are - how they alternate  
2 systems.

3 When you come to a preoperational phase  
4 design certification or combined license applicant you  
5 might not have that information and so you make  
6 assumptions about how you're going to align your  
7 systems.

8 You may have some philosophy of guidance  
9 documents of how you're going to operate the plants.  
10 But they're not as tight as having the procedure. So  
11 this recognizes that you're going to need to make  
12 assumptions about that.

13 Again, this all leads into documented  
14 assumptions. The second to the last bullet there is  
15 large release frequency. Current reactors use large  
16 early release frequency as their metric.

17 It's typically around ten to minus five for  
18 that. There's a very old SRM SECY that establishes  
19 the idea of large release frequency and it has it at  
20 one in a million. So the metric is slightly  
21 different.

22 Fundamentally, though, if you were to go  
23 into the standard and just change everywhere where it  
24 says LERF to LRF, conceptually you would be okay. You  
25 just have to apply it.

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1           VICE-CHAIR BLEY: A couple years ago we had  
2 a lengthy meeting here with many different people  
3 expressing thoughts about those two terms and coming  
4 up with some of what I thought were bizarre  
5 interpretations.

6           To me, the interpretation that makes no  
7 sense is large release is both large early and large  
8 they come later. It's the total amount frequency of  
9 large releases whenever they occur. That's what you  
10 mean?

11          MR. HARRISON: There have been multiple  
12 interpretations of large release frequency - the means  
13 and every applicant has defined it slightly different  
14 that's come in for design certs.

15          And so going forward what we've done is  
16 written in a - I believe we've gotten SRM on that SECY  
17 that basically said we use this term - they are meant  
18 to be the same. There's an old EPRI report that  
19 brought in the large early release frequency concept.

20          And so for the preoperational phase we're  
21 still using large release frequency. But once the  
22 plant goes into operation we will shift over to using  
23 the large early release frequency -

24          Okay. That's just where we are. I remember  
25 actually giving a comment that almost said exactly

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1 what you just said and was corrected. So but I hadn't  
2 researched it at that point.

3 So the last category is what I call  
4 technical challenges. There's these eight things that  
5 - when we started looking at the standard we started  
6 to group things together and they fell into these kind  
7 of eight bins where the standard for a new reactor  
8 design has trouble addressing directly as its written.

9 One is site-specific features and  
10 characteristics. If I'm in design cert I don't have  
11 a site most likely. Therefore, it's hard to say I've  
12 designed for site-specific features.

13 I might be able to envelope most sites but  
14 I can't assure myself that it does that until I  
15 actually pick a site. So there's a challenge there.

16 Supporting events and hazards for analysis -  
17 if you go through the standard there's places based on  
18 current operating conditions where it says you can  
19 spring out this hazard if it meets certain capability.

20 If you designed it for the 1975 SRP you  
21 effectively can spring out some external hazards.  
22 Unfortunately - well, fortunately, the plants are much  
23 safer.

24 They're much, much lower calculated risk  
25 members. But that also drives to is then screening -

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1 just because I meet a certain design capability in a  
2 standard review plan doesn't mean that that hazard is  
3 an insignificant contributor to risk.

4 So there's some inherent risk numbers that  
5 are built into those SRPs with the screening criteria,  
6 often around 10 to the minus six or even higher, and  
7 if you've got a plant calculating internal events core  
8 damage frequency in the 10 to the minus seven range  
9 well, then your screened out hazards might be more  
10 important than the hazards you analyzed.

11 So we addressed that and walked through  
12 those requirements to address that for new reactors.

13 Plant-specific layouts - this is mostly in  
14 the fire area. You may not know where all your cables  
15 go. You haven't quite arranged - you haven't designed  
16 to that level of detail.

17 You may not know the specific capabilities  
18 of, say, exposed structures. You mostly likely are  
19 going to assume you don't have exposed structures to  
20 fires. But if you thought you did, you wouldn't quite  
21 exactly know that at this stage. So there's issues  
22 with cable routing and that type of thing that you  
23 have to address.

24 Plant-specific operating experience - many  
25 of the supporting requirements call for using plant-

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1 specific data, plant-specific experience and you don't  
2 have that at this stage of these alignments.

3 So plant-specific guidance that's similar to  
4 what I mentioned on the prior page about - again,  
5 you've got general guidance. You don't have plant  
6 specific EOPs or AOPs or operator options.

7 There's a number of the supporting  
8 requirements that talk about doing interviews of  
9 people and the implication is people that have had  
10 plant experience at that plant so that they can shut  
11 their results and make sure that what's coming out is  
12 common with their experiences.

13 So it's kind of like experience related.  
14 But they won't have those experience and so we've  
15 addressed how to do those interviews. Walk downs -  
16 you can't walk down a plant you haven't built.

17 You can do talk throughs of things but you  
18 can't walk down the plant and you can't confirm where  
19 locations are of missiles and that type of thing. So  
20 that's a challenge.

21 And, finally, the treatment of  
22 uncertainties. Recognizing a design cert and a  
23 combined license applicant are going to be making -  
24 just because of these prior issues they're going to be  
25 making a lot more assumptions about how the plant

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1 operates, how they plan to operate it and how that  
2 influence is the result.

3 So there's this category on treatment of  
4 uncertainties and I'm using the uncertainties as just  
5 a much more general term of uncertainty than specific.  
6 The more assumptions you make the more uncertainty you  
7 have about the results.

8 So we've added some requirements to try to  
9 capture that documentation of those uncertainties.

10 Now I'm going to shift over to - when you  
11 look at this what we try to do is go through each of  
12 the supporting requirements.

13 There's 686 supporting requirements in this  
14 - well, after we added a number of them you come up  
15 with a little under 700 supporting requirements that  
16 you have to evaluate, and this was the general  
17 approach that we followed.

18 Similar to what's in the PRA standard,  
19 recognizing this is not really a risk-informed  
20 application as much as it's applying the risk  
21 information. So it's kind of flipped.

22 Again, we're going to come back to this  
23 first bullet or the first couple bullets here, the  
24 identification or the application of the design cert  
25 applicant or the COL, the determinant capability

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1 categories currently in the interim self-guidance  
2 we're saying meet the high level requirements and  
3 generally address capability category one with some  
4 noted exceptions.

5 Sometimes the supporting requirement has no  
6 action and when you get to external floods and high  
7 winds the capability of category one says it's not  
8 defined. It's because they assumed that if it got  
9 sprunged in you had to do more.

10 So we've given some guidance there where we  
11 looked at what should be done under capability of  
12 category two in those cases.

13 The final one is determination of the  
14 standard scope and level of detail. So the way we  
15 went about this is we evaluated the applicability of  
16 every supporting requirement for the design cert and  
17 combined license application stage.

18 So the first thing was is it applicable to  
19 those stages and then evaluated the feasibility of  
20 meeting that supporting requirement at capability  
21 category one.

22 And oftentimes we determined in trying to  
23 meet capability of category one you would have to  
24 determine - that we determined that clarification was  
25 needed to support that where additional guidance was

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1 needed to be able to achieve that capability category.

2 When we went through that we had these six  
3 categories we created in evaluating the outcomes and,  
4 again, do you want to hear me talk about we're  
5 considering changing this approach?

6 But the outcome of this was 75 percent of  
7 those requirements we determined that you could meet  
8 them with just a little bit of clarification.  
9 Oftentimes, you could meet all those requirements, and  
10 there's a few requirements that are different between  
11 design cert and COLs.

12 So 75, you look at these numbers as being  
13 kind of a ballpark average. It may be like 80 percent  
14 for COL and 73 percent for design cert. So there's a  
15 few requirements that one can meet and the other  
16 can't.

17 A high percent of the requirements we  
18 decided that you could not meet them and sometimes in  
19 reading that requirement, not often but in a few cases  
20 we identified a clarification that what you should be  
21 doing instead.

22 Not applicable, there was about 6 percent of  
23 those that fell into that category. Oftentimes, if  
24 not applicable because it's conditioned on an activity  
25 you're not going to do and therefore you can't do this

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1 one, the simple one is when you're looking at a  
2 requirement that says Bayesian update the generic  
3 database with your plant-specific experience.

4 Well, you're not going to Bayesian update  
5 that because you don't have plant-specific data. So  
6 it becomes - that requirement is not applicable to a  
7 design cert.

8 That's a typical thing. This is kind of a  
9 reverse of the cannot meet. Here we oftentimes had a  
10 clarification where it told you to do something that  
11 wasn't part of the not applicable.

12 It cannot meet, so oftentimes we were, like,  
13 you know, perform a walk down of a plant. We said,  
14 well, you just can't do that. The not applicables  
15 would say, you know, do this and we said well, you  
16 can't do that because of this but you could do  
17 something else instead.

18 CHAIRMAN STETKAR: Yeah, I look forward.  
19 We're going to come back to something later so -

20 MR. HARRISON: Yes.

21 CHAIRMAN STETKAR: - we'll wait to discuss  
22 some more of the nuances of that.

23 MR. HARRISON: In about eight slides we'll  
24 come back to that. The last three categories are  
25 things we saw replacing. We took a requirement and we

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1 replaced it with a new requirement, a different  
2 requirement than what was - oftentimes, there's a  
3 little judgement between what's a replacement and  
4 what's an enhancement. But in the enhancement  
5 category, we took an existing requirement and said  
6 well, if we just add this to it, it will cover our  
7 needs.

8 Most of those are in the documentation of  
9 assumptions. And the same with new. If we couldn't  
10 find a requirement to enhance on documenting your  
11 assumptions we had to create a new one. So that's the  
12 last one there.

13 Now I'm going to shift over to the comments  
14 that we received on the draft ISG. It was issued for  
15 use and comment November 2014. We got one set of  
16 comments.

17 They were submitted by NEI representing the  
18 industry. We broke it down into 49 specific comments  
19 and this just - at a high level. The staff agreed  
20 with 37 comments and made changes that are  
21 appropriate.

22 Some of the comments we agreed with but we  
23 didn't need to make a change. We just needed to  
24 recognize the position that was being described. Of  
25 those 12 comments that the staff disagreed, seven of

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1       them, even though we disagreed with the comment we  
2       still ended up making some change on those  
3       requirements.

4               Oftentimes that was because we recognized  
5       either the staff position was wrong in some cases or  
6       that we really needed to clarify the intent of what we  
7       wrote in our clarification.

8               So it was more explicit, even though it  
9       wasn't necessarily directly tied to the comment that  
10      we got. They made us go back and read that, the  
11      section, and realized that we needed to enhance it.

12              In addition to looking at that and going to  
13      the finalized we looked back at the subcommittee  
14      meeting we had last year when we discussed the draft  
15      ISG-8.

16              We had some internal reviews and received  
17      comments and edits from those activities and then,  
18      again, the similar effort that's going on within the  
19      PRA standards community helped enlighten us in some  
20      areas where we ended up changing our position on some  
21      of the designations for the - what we could do with  
22      the supporting requirements.

23              Here's a summary of the industry comments.  
24      Again, I took those 49. I broke them into these three  
25      broad categories and then subcategories. Twenty-four

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1 of them were more in the editorial clarification,  
2 making sure we were consistent. There were a couple  
3 corrections that - entries we had.

4 Fifteen fall into the area of assumption and  
5 then certainly the most prominent one was there was a  
6 constant theme about we would say in our clarification  
7 a design cert doesn't have this information. The COL  
8 will have more information and can address the  
9 requirement explicitly.

10 The industry gave us a comment that said  
11 recognize that even at the COL stage they're still  
12 going to be making some assumptions. We agree with  
13 that and so we enhanced the clarification to make it  
14 clear that it's not like you know everything when you  
15 come in for the COL application. You may know more  
16 and it will progress and evolve as you get more  
17 information.

18 And then the last category had to do with  
19 the ten supporting requirements that dealt with -  
20 comments that dealt with how we addressed screening of  
21 hazards or events.

22 Switching over to this, I mentioned that it  
23 was not just the industry comments that influenced how  
24 we change. This is actually a roll up of the - where  
25 within the supporting requirements we actually changed

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1 the designation from one category to another.

2 So, like, the very first one there on the  
3 initiating even, A4, we changed it from a not  
4 applicable to a can meet and that was driven by three  
5 different areas to work on the PRA standard, the ACRS  
6 and some internal comments.

7 So this walks through. The things in the SR  
8 column that are in purple are those that are related  
9 directly to an industry comment. So you'll see on SY-  
10 A19 we said you could not meet it.

11 Based on an industry comment we changed that  
12 designation to a can meet. So that was a direct  
13 comment that we got that we changed the designation  
14 after we wrote it.

15 HR-E3 was one that we had at the draft stage  
16 ACRS subcommittee meeting that also flagged. We  
17 changed our approach to some of these and changed it  
18 from a cannot meet to a can meet as well. If you look  
19 down at DA-C14 that's one where we had an industry  
20 comment on it but it's not purple.

21 That's because they gave us a comment and we  
22 changed it. But it wasn't directly related to a  
23 comment they made. It was - their comment we actually  
24 disagreed with.

25 But in looking at it we realized our

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1 designation was wrong and so we had to change it  
2 anyway. So sometimes just being told to go read  
3 something again can help you make a change.

4 This is all the ones that change within the  
5 internal events part of the - which is part two of the  
6 standard.

7 For the remainder of the standard, here were  
8 the other changes that's three through nine, which  
9 covers the external - the internal flood, internal  
10 fire screening seismic external hazards for high winds  
11 and external floods, that type of thing. So these  
12 were those changes.

13 VICE CHAIR BLEY: But even so, and I'm  
14 sorry, I had to step out for a minute.

15 MR. HARRISON: Oh, that's fine.

16 VICE CHAIR BLEY: Even so, there might be  
17 notes in the comments column that say not applicable  
18 but maybe if something's different it would be  
19 applicable. So you got to - you got to go through  
20 every one and understand those comments.

21 MR. HARRISON: Right. And we'll come back  
22 to that. But yes, you are correct. And again, this  
23 was only the places where we changed the actual  
24 designation of a can meet or cannot meet type of  
25 thing.

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1           There were a number of comments, a number of  
2 areas where we changed the clarification that we  
3 provided or we enhanced the clarification based on the  
4 comment. And then we have the broader issue about the  
5 structure of having to go through and read the comment  
6 section to understand.

7           Even though it says cannot meet or is not  
8 applicable you still may need to do something.

9           MEMBER BROWN: I have - can you explain  
10 something to me, the uninitiated, what can and cannot  
11 meet? Supporting requirements, I take it, is what  
12 you're talking about?

13          MR. HARRISON: Right.

14          MEMBER BROWN: What does it mean if you can  
15 or cannot meet a supporting requirement?

16          MR. HARRISON: Yeah, and we'll get to that.  
17 But just real quickly -

18          MEMBER BROWN: I'm just looking for a basic  
19 definition of what that - I mean, I haven't - all  
20 these - you mentioned one of these, an example ES-B1,  
21 whatever that is. That's a - is that some scenario or  
22 something - an event?

23          MR. HARRISON: An example would be, again,  
24 a supporting requirement that says when you Bayesian  
25 update your data -

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1           MEMBER BROWN: I have no idea what that  
2 means.

3           MR. HARRISON: Okay. When you take - when  
4 you take generic data and now I want to influence the  
5 generic data with plant-specific experience I use -  
6 they use their own to do that.

7           So they'll refer to that as Bayesian  
8 updating, right. Well, you have to have experience  
9 for that. So you don't have that experience. So we  
10 would have designated that as not applicable.

11           You're not going to be doing that because  
12 it's not there. So you don't - that requirement for  
13 a design cert is not applicable to them. They don't  
14 need to address it in that particular case.

15           It cannot meet - the requirement said after  
16 you're done with building your PRA model walk down the  
17 system and confirm or verify the adequacy of the  
18 system model. You're at design stage, you can't walk  
19 down the system because it doesn't exist.

20           MEMBER BROWN: That's a cannot meet.

21           MR. HARRISON: So that would be one way to  
22 say you cannot meet that -

23           MEMBER BROWN: Requirements in the PRA that  
24 you cannot meet.

25           MR. HARRISON: You cannot, because, again,

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1 it was written with the concept that it was an  
2 operating plant that was already built.

3 We already knew the systems, all right.  
4 Since it was - the standards were developed in the,  
5 you know, late '90s, early 2000s, all the plants were  
6 running, if you will - the concept behind it.

7 All right. So they have that language in  
8 there. Instead of writing it more generically, you  
9 could address this or you could put a statement in  
10 there - if you can do this, you know, do a walk down.

11 MEMBER BROWN: All right.

12 MR. HARRISON: So that's kind of an example.  
13 Again, we'll come back to our comment. We got the  
14 subcommittee that is influencing what we go with that  
15 - with this whole approach.

16 MEMBER BROWN: Okay.

17 MR. HARRISON: So this is just kind getting  
18 you up to speed on our history. You're going to get  
19 the answer that we're changing that approach. But so  
20 which is a good thing. You brought me right to the  
21 subcommittee meeting we had back in August 21st.

22 The staff had three main takeaways from that  
23 meeting. There were some other comments that we're  
24 going to try to reread our words and try to make the  
25 text better. But these were the three main takeaway.

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1 Right now, within the interim staff guidance  
2 we talk about seismic margins analysis versus making  
3 a combined license applicant perform a seismic PRA.

4 So that's one of the issues. Another one  
5 was the scope or objective to address capability  
6 category one in the standards world as opposed to two.  
7 Two is supposed to be more realistic. One is supposed  
8 to be less realistic capability.

9 So it's a lower level, if you will. The  
10 third one is this use of designations of cannot meet  
11 or not applicable when yet we still require an action  
12 to be performed through the clarification discussion  
13 and the confusion that that can create.

14 So I'm going to briefly walk through these  
15 three topics. Okay. The seismic margin in the  
16 analysis that's promoted in the ISG is derived from  
17 an SRM on a SECY 93-087.

18 It's also reflected in a DC/COL-ISG-020 and  
19 in the SRP 19.0 that you can utilize a PRA based  
20 seismic margin and design cert, a COL if they can show  
21 that their site symbol by the design cert they can  
22 just use that without having to revise it.

23 The middle point here is - we've talked with  
24 some of our management. We're contemplating if a  
25 change in the policy should be considered. We would

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1 have to move that up the chain and take that further  
2 along so that's where we are since August 21st.

3 So we're engaging in that topic of if  
4 there's a need to pursue a change in the policy that  
5 says something like combined license - you've got the  
6 site information - this is the stage where you should  
7 convert over to a seismic PRA.

8 Recognize within the 50.71 age requirement  
9 the prior to fuel load they have to make this  
10 conversion. They have to convert to a seismic PRA by  
11 that time. But, again, do you want to wait until a  
12 fuel load to actually have that change when you could  
13 start at least that process at this stage.

14 This is currently going on in consideration.  
15 So the current position is we'll go forward where we  
16 are right now with the existing position in the SRM  
17 and recognize that if the commission - if they  
18 actually do go forward with a policy change and we get  
19 direction from the commission to implement a change we  
20 would then come back and change the ISG.

21 VICE-CHAIR BLEY: Donnie, we have been  
22 pursuing this for several years through a number of  
23 letters and responses back from the EDO. We have yet  
24 to have anyone point us to any place the commission  
25 has ever addressed this, period.

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1           So I don't know why it's a commission  
2 change. The only place we can track it down to is  
3 previous ISGs from the staff to the staff.

4           MR. HARRISON: This SRM SECY 93, I already  
5 said, brings up the idea. I believe it starts in the  
6 concept of design cert.

7           VICE-CHAIR BLEY: But didn't come back as an  
8 SRM. It went up as a -

9           MR. HARRISON: It went up as a SECY and then  
10 we got an SRM that approved it.

11          VICE-CHAIR BLEY: The position was actually  
12 approved in the SRM.

13          CHAIRMAN STETKAR: I'm sorry. I'm paging  
14 through that SRM right now and it's a ten-page SRM and  
15 I'm not a speed reader. But if you could point me to  
16 the place where the commission has said use seismic  
17 margins analysis for a place where you have seismic  
18 hazards and seismic fragility information, I'd really  
19 like that pointer -where the commission has directed  
20 the staff to do that in this SRM. I can't find it but  
21 admittedly I'm trying to do that speed reading.

22          MR. HARRISON: Yeah, it would probably be  
23 back on - somewhere around Page 7 section - it's like  
24 item 17, I believe.

25          CHAIRMAN STETKAR: Okay. I'll go look at

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1 that.

2 MR. HARRISON: Yeah, it's within that. It's  
3 cryptic because you have to put it in the context.  
4 But there -

5 CHAIRMAN STETKAR: It's cryptic because the  
6 staff has taken an expedient interpretation of words  
7 to make things easy because I don't see. It says this  
8 commission approves the use of 1.67 times the design  
9 basis SSE for a margin type assessment of seismic then  
10 okay.

11 MR. HARRISON: It's the next paragraph. The  
12 commission approves the following staff recommendation  
13 as modified. Again, they got that 1.67 in there. But  
14 in there it says the PRA-based seismic margin analysis  
15 will consider sequence level -- high confidential  
16 probability -

17 CHAIRMAN STETKAR: It does. Commission  
18 approves the following staff recommendation as  
19 modified.

20 MR. HARRISON: And the modification was to  
21 change from the two times to one -

22 CHAIRMAN STETKAR: One and two-thirds times.

23 MR. HARRISON: So that's where that is  
24 coming from. The next paragraph talks about the five  
25 amount methodology that you could actually direct to.

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1 But not limited to.

2 CHAIRMAN STETKAR: Thank you.

3 MR. HARRISON: But the original, at least  
4 from my - what I can find that's the original genesis  
5 of the this and it's, again, then found its way into  
6 the ISGs and then into the SRP 19.

7 CHAIRMAN STETKAR: For reference, that's -  
8 that SRM was issued in July of 1993.

9 MR. HARRISON: You're right. And that one of  
10 the questions -

11 CHAIRMAN STETKAR: A couple years ago.

12 MR. HARRISON: One of the discussions we're  
13 having with the management is is this the right time -

14 CHAIRMAN STETKAR: I'm sorry. Twenty years  
15 ago. I can't add.

16 MR. HARRISON: Yeah. Is this the time to  
17 change. So that's part of the discussion is with the  
18 methods and approaches is it time to change that.

19 The next topic was the scope and objective  
20 to address capability category one versus capability  
21 category two. Again, two is more refined. It's  
22 supposed to be a more realistic state of practice PRA.  
23 One is typically less than state of practice PRA.  
24 It's more general.

25 Within the ISG-003 in SRP 19 we restate that

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1 capability category one is identified is the generally  
2 accepted position approach for these avocations.

3 And I note that the ACRS and the staff have  
4 exchanged memos on this topic as well in the context  
5 of the latest revision.

6 CHAIRMAN STETKAR: Not memos. ACRS letters.

7 MR. HARRISON: Letters.

8 CHAIRMAN STETKAR: That's different than a  
9 memo. We're on record of opposing this notion.

10 MR. HARRISON: Okay. Sorry about that.  
11 Yes.

12 CHAIRMAN STETKAR: The reason I bring that  
13 up is these meetings are on the public record and I  
14 don't want to have things misconstrued as internal  
15 memos versus formal position.

16 MR. HARRISON: Yeah. Fair enough. These  
17 are formal exchanges of letters on this topic and the  
18 staffs perform some evaluations of the SRs - the  
19 supporting requirements that are different between  
20 these different categories.

21 So on this slide, the - there's been at  
22 least three different times where people have tried to  
23 run through the standard in the ISG where we stood at  
24 and so we get slightly different numbers every time  
25 that there are changes in positions.

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1           So take the numbers as ballpark numbers.  
2 They're close but they may go up and down a few,  
3 depending on how we've changed on the ISG.

4           So there's 686 supporting requirements that  
5 are discussed in the interim staff guides. That  
6 includes what's in the current PRA standard plus the  
7 things we've added as requirements for these aspects.

8           Five hundred and 44 of those - that's  
9 somewhere around 75 percent - are the same. There is  
10 no difference between the capability of one and  
11 capability of two. So it leaves you 142 supporting  
12 requirements that are different.

13           Of those, 34 of those differences is because  
14 the capability of category one there is no defined  
15 requirement or there's no action required. And I'll  
16 note in the - in our approach with in the ISG we  
17 evaluated those to see if you should actually meet  
18 capability two or at least one case category three  
19 since there was no requirement at one for those and we  
20 provided that guidance within our clarification of  
21 what you should do.

22           Eighteen supporting requirements cannot be  
23 met or are not - that have differences you can't meet  
24 capability one. So if you can't meet one you can't  
25 meet capability two either.

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1           So that's - again, for those that are  
2 different there's a number that are capability one and  
3 two. There's no difference. You cannot meet them but  
4 there's 18 that we state even though they're different  
5 you can't meet it or it's not applicable.

6           There's eight supporting requirements that  
7 if you use our general clarifications like when  
8 there's - when it calls for plant specific operating  
9 procedures you're going to leverage general good  
10 practices and general guidance from the design cert.

11           If you were doing both that clarification on  
12 capability category two, it would become the same as  
13 capability category one because that was the  
14 fundamental difference between those two.

15           There's five supporting requirements that  
16 aren't achievable at capability two while you could  
17 get capability of category one - somewhere between  
18 five and ten but somewhere around - it's a small  
19 number.

20           That leaves 77 supporting requirements that  
21 you could achieve a capability of category two that we  
22 would need to focus on if we were to change, that we  
23 believe somewhere around 75, 80 that you could  
24 actually achieve at that level.

25           So if we talk about them, what that gets to

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1 is do we need to essentially bring those 77 supporting  
2 requirements into scope at a higher level than they're  
3 currently addressed.

4 So, again, we've taken this to management.  
5 Right now, the management supports maintaining the  
6 current staff position.

7 I know that people who are category one is  
8 generally accepted for these applications, recognizing  
9 that when there's not a requirement at one we did  
10 address two and it's limited in scope strictly to the  
11 licensing, if you will, the design cert and the  
12 combined license application stages.

13 So as you go in to use the PRA for other  
14 things you'll - you would need to address those  
15 additional 77 requirements anywhere.

16 CHAIRMAN STETKAR: I think for the -  
17 obviously, we're at a point here where we disagree.  
18 But for the benefit of the other members who didn't  
19 attend the subcommittee meetings I think our position  
20 has been why not provide guidance that says the DC-COL  
21 PRAs should meet capability category two and in cases  
22 where you can't they document why not.

23 That would - that would provide clear  
24 direction to the people developing the PRAs and the  
25 people reviewing or auditing the PRAs that indeed the

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1 desire is to meet capability category two so you don't  
2 run into situations that we have identified, ACRS, in  
3 the past where people have left things out or so  
4 dramatically simplified parts of their models that you  
5 know they're wrong based on information that's  
6 available in the design certification document.

7 So it wasn't the lack of information. In  
8 one question the applicants have said, well, we don't  
9 need to put that amount of detail in there because  
10 it's not required by capability category one and  
11 that's all the NRC requires us to do, so go away.

12 It also, as a pragmatic approach, would  
13 provide a record for the poor COL holder now who needs  
14 to bring their PRA up to capability to - I don't want  
15 to say capability category two because that has some  
16 different connotations - has to improve the scope and  
17 criteria - quality of their PRA prior to fuel load.  
18 It'll give them pointers of the areas where they need  
19 to really focus their efforts on, at least in the  
20 context of the standards and the ISG. So I absolutely  
21 am confounded by this notion of NRC management says  
22 this is good enough and then it's all good.

23 VICE CHAIR BLEY: And I just had one thing.  
24 On the previous slide that you showed us, you know,  
25 given you've done this, a document like the one you're

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1 preparing could flag these.

2 But this is kind of somehow on a generic  
3 basis and it lumps COL and design cert, which some  
4 things could be done more toward category two at the  
5 COL stage and some designs are more complete than  
6 others in these areas. So it would vary some by  
7 design as well.

8 MR. HARRISON: Yeah, and that's a fair - and  
9 I'll come back to it, John, on Dennis' comment.  
10 That's a fair comment. These are kind of average  
11 numbers.

12 We say early on that if you have more  
13 information you should be building your PRA using that  
14 information.

15 CHAIRMAN STETKAR: You say that, but in many  
16 cases if I put more information in there as - I'll now  
17 put my applicant's hat on - you say, well, if you have  
18 more information you should put it in there but you  
19 don't have - but you're not required to. So what am  
20 I going to do? I'll put more information there and  
21 open myself up to more RAIs and questions. I'm not  
22 required to do it.

23 The staff says I'm not required to do it,  
24 therefore I will not - I will not do it. I'm required  
25 to drive my car at less than 30 miles an hour. I'm

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1 not required to drive it at 27.6 miles per hour. I'm  
2 driving it at 29.9. That's all I'm required to do.  
3 You know, that's -

4 MR. HARRISON: And that's a fair comment.

5 CHAIRMAN STETKAR: - that's the way it is  
6 interpreted.

7 MR. HARRISON: Right. And -

8 CHAIRMAN STETKAR: And interpreted that way  
9 by the staff. I'm not required to look at anything  
10 more because I'm not required to.

11 MR. HARRISON: And - yeah, and I would say  
12 if that's the interpretation that's an unfortunate  
13 one. If we were to see something that's unique that  
14 makes you want to do something more -

15 CHAIRMAN STETKAR: Donnie, I've seen things  
16 in DC PRAs that have had a single box basic event for  
17 an entire system. I can look at the P - at the - it's  
18 not an P&ID.

19 I can look at a one-line flow diagram for  
20 that system and see it's got a couple of pumps in it.  
21 I can go find load lists to see that one pump is  
22 powered from bus A and one pump is powered from bus B.  
23 I know, looking at the DC document more than the fact  
24 that it's a single little box.

25 I also know what systems it cools. I can

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1 build the model for it, and when questioned the staff  
2 approved. Staff said they audited the PRA - it was  
3 fine. Met capability category one and when questioned  
4 the applicant said that's all we need to do.

5 It says I'm allowed to use super component  
6 models for systems and they did, and they will because  
7 they're allowed to do it.

8 Now, we have other examples.

9 MR. HARRISON: And you have to be careful.  
10 Yeah, I understand there's probably a multitude of  
11 examples of where someone did something, a shortcut or  
12 an approach that you might have lost an insight and,  
13 again, if you're changing the insights then -  
14 especially in this situation that we shouldn't be  
15 having that.

16 That should be part of the PRA technical  
17 adequacy review to say if this influences the insight  
18 then that would have been an error on the applicant  
19 and an error on the staff to let that go through, just  
20 in a frank situation there.

21 But I would agree, this position was derived  
22 back in the mid-2000s. I don't know exactly what year  
23 but it was in the mid-2000s when we were developing  
24 the guidance originally for the standard review plan  
25 and the position on risk-informed applications is

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1 basically the PRA needs to be - the capability needs  
2 to be consistent with the application.

3 So back then, that was evaluated and it was  
4 at that stage you look at what you're using it for,  
5 how it's influencing things and it was determined in  
6 that period that capability category one was  
7 sufficient commensurate with its application.

8 So that's the history. That was a staff  
9 determination in developing the early SRP 19 formula,  
10 again, recognizing there's a difference of opinion  
11 between the ACRS and their letters and the staff's  
12 position.

13 This is the - let's see - the last topic had  
14 to do with the designations of cannot meet or not  
15 applicable when we have an action still expected. So  
16 sometimes there's a supporting requirement.

17 It says do these three things and one of the  
18 three things is walk down the plant. We said well,  
19 you can't meet the requirement because you can't walk  
20 down the plant.

21 But those other two things we want you to  
22 do, and it gets captured in a clarification. If we  
23 wanted to be fancier we could have said oh, this is a  
24 partial meet, partial can meet and then you'd have to  
25 read the clarification column to prefigure out what

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1 that meant.

2 So we stepped back and looked. Again,  
3 there's 686 supporting requirements. Eighty of them  
4 are identified as cannot meet or not applicable so -  
5 which infers that, you know, there's about 600 or so  
6 that are can meet, replaced, enhanced or new.

7 So we're dealing with those 80 percent or  
8 those 80 supporting requirements where you could get  
9 confused by having a can meet or - cannot meet or not  
10 applicable but still needing to do something.

11 About half of those, somewhere around half,  
12 of these include a clarification. Most of it is  
13 related to the not applicables, but there are some of  
14 the cannot meets like the multi gas walk down that are  
15 - have a clarification that says we still want you to  
16 do something.

17 We also - not just the ACRS subcommittee  
18 discussion on this but we also had a public comment  
19 from the industry that essentially said that this was  
20 confusing and if we designated something that's not  
21 applicable then the inference should be that you don't  
22 have to do anything, and the same with a cannot meet.  
23 So our clarifications sometimes they thought were -  
24 created confusion.

25 Again, we've met with our management and

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1 talked about this. We've agreed that we probably  
2 should change the approach here. We were following an  
3 approach that was kind of going on the PRA standards  
4 committee so we're going to step back and turn - take  
5 the recommendation that was actually made by the ACRS  
6 members to use language of qualification and  
7 clarifications to make it more explicitly clear.

8           Instead of getting caught up in terminology  
9 of cannot meet or can meet let's just say what do we  
10 want - what's the clarification - what's the  
11 qualification we have for this requirement. It seems  
12 like a straightforward thing but it's going to be a  
13 significant rejuggling of the columns and information  
14 in some cases.

15           So we're going to move forward with that  
16 change but it's going to delay going forward a little  
17 bit.

18           CHAIRMAN STETKAR: I don't want to get into  
19 - I'm surprised you say it's a significant - but I  
20 haven't thought about it much. So -

21           MR. HARRISON: Well, just - if you think of  
22 columns in an 80- or 90-page document, a 90-page  
23 table, and you start moving the columns and the  
24 entries around, it's going to be interesting. But so  
25 that's - it's not a technical challenge. It's more of

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1 a -

2 CHAIRMAN STETKAR: I guess I would have just  
3 replaced cannot meet and not applicable with see  
4 comments and qualifications or something like that.  
5 Just changing two words in one column, but that's me.

6 MR. HARRISON: Well, what I did is I went  
7 back and looked at how qualifications and  
8 clarifications are written in Reg. Guide 1.200 and,  
9 again, since this eventually - the concept gets  
10 incorporated into there, we actually saw the comment  
11 as something that made sense to help us in that  
12 transition anywhere.

13 And so there's - we can leverage - if we  
14 make the, if you will, the format changes now it  
15 becomes easier to incorporate into the Reg. Guide  
16 later. So you have to do it later anyway. You might  
17 as well do it now. So but it's not a technical issue.  
18 It just is going to take a little time to do it.

19 Okay. That gets us to the next steps.  
20 We've completed all the administrative steps for  
21 issuance of the ISGA. We've gone through OGC. We've  
22 gone through OMB's review on the version that we've  
23 given to the subcommittee.

24 We need to make the changes that resulted  
25 from the ACRS subcommittee, specifically this change

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1 in the qualification and clarifications approach. And  
2 then, like I say, I want to reread some of the  
3 sections where we had comments and see if we can  
4 clarify some of the language we're using. That was  
5 also mentioned at the ACRS subcommittee meeting.

6 That leads us to issuing it somewhere in  
7 late 2015. If we get delayed because of workload or  
8 whatever maybe it slides into early 2016, holidays and  
9 such. But that's where we are and I think that's the  
10 end of my presentation.

11 VICE CHAIR BLEY: Thanks, Don. Anything  
12 from the members for Donnie's talk here? Victoria,  
13 are you going to come up?

14 MS. ANDERSON: Sure.

15 VICE CHAIR BLEY: On your way I just want to  
16 mention something maybe you can respond to. You've  
17 now have a few weeks since we saw you last time to  
18 look at what the staff did with your comments. If you  
19 can bring us up to date on that.

20 MS. ANDERSON: Sort of. So what we got was  
21 really -

22 VICE CHAIR BLEY: Well, you need - you need  
23 your microphone.

24 CHAIRMAN STETKAR: Turn on your microphone  
25 because we -

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1 VICE CHAIR BLEY: Bottom.

2 MS. ANDERSON: Okay. So we got the slide  
3 presentation that was given at the meeting. We still  
4 have not seen the actual draft ISG itself.

5 VICE CHAIR BLEY: Oh. Never mind.

6 MS. ANDERSON: But that's - we did see the  
7 slide presentation so we did have an idea of how the  
8 staff said they were going to disposition our  
9 comments.

10 So there are a few comments that I touched  
11 on before that the staff did resolve and so not  
12 bringing them up today. Sounds like we're in pretty  
13 good shape with that.

14 So just as background - I think Donnie went  
15 over this before - the draft ISG got issued about a  
16 year ago. We provided comments at the beginning of  
17 this year and we focused on the appropriateness of the  
18 various SRs for a DC and COL applications and we still  
19 haven't seen the most recent draft of the ISG.

20 I'm going to bring up the capability of  
21 category treatment again. We did discuss this during  
22 Donnie's presentation. The focus is still on  
23 capability category one, as far as we understand, on  
24 the latest draft of the ISG and this is consistent  
25 with a previously issued new plant PRA ISG - DC COL

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1 ISG 3 and I have the statement from that ISG up here  
2 on the slide.

3 The PRAs that meet the applicable supporting  
4 requirements for a capability of category one and meet  
5 the high level requirements as defined in the ASME  
6 PRA standard should generally be acceptable for DC and  
7 COL applications.

8 So where we have an issue with this is that  
9 as Donnie noted there are some SRs that state no  
10 action to meet capability category one and right now  
11 ISG 28 gives expectations to meet capability category  
12 two in some of those cases.

13 We think that's confusing. We think it  
14 would be better to write a new requirement rather  
15 than, say, meet capability category two.

16 We just found out that there's a potential  
17 conflict and confusion between ISG 3 and ISG 28. We  
18 do understand why the staff is saying well, we can't  
19 really just say no action in some of these cases.

20 But to point people to capability category  
21 two we found that to be inconsistent. We did also  
22 note there are still a couple of areas for improved  
23 clarity and we weren't quite sure if these got  
24 sufficiently addressed in the draft ISG.

25 They were spoken to in the - in the

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1 subcommittee meeting. But, again, we haven't seen the  
2 final resolution. There was still some lack of  
3 clarity on cannot meet versus can meet for the use of  
4 generic and plant-specific data. We thought that  
5 there could be some improved clarity with how codes  
6 could be acceptable if they were within known or  
7 demonstrated limits of applicability. Known could be  
8 difficult to achieve for plants we don't have OE with  
9 yet. We thought it would be beneficial to make more  
10 complete reference to the applicability of large  
11 release frequency throughout the document. It's not  
12 really referenced everywhere it comes up so we thought  
13 that that could be more complete.

14 There were still a couple of lingering as-  
15 built versus as-to-be-built in the document. You  
16 know, we just haven't seen the document to verify that  
17 those have been taken care of.

18 So, again, we haven't seen a final document.  
19 I think the staff, on these issues for a potential for  
20 improved clarity, I think the staff - it sounds like  
21 they've made an effort to address that. We just  
22 haven't seen the document to verify that.

23 So we do think that the ISG addresses the DC  
24 COL considerations for the most part but we really  
25 need to address the - how you deal with the SRs with

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1 no action criteria for a capability category one to  
2 make sure that we maintain consistency between ISG 3  
3 and ISG 28.

4 VICE CHAIR BLEY: Thank you, Victoria.  
5 Anything from the members? John, you're going to -  
6 the phone line's open. We're going to take public  
7 comments in just a moment.

8 There is no public in the room with us so  
9 we're going to check the phone line and see. If  
10 you're on the phone line give us a second.

11 I think we've heard - is there anyone on the  
12 phone line who would like to make a comment? Thank  
13 you. I guess not. Mr. Chairman, back to you.

14 CHAIRMAN STETKAR: Thank you. I'll thank  
15 the staff and NEI - Victoria. It was short but sweet.

16 With that, we will recess and go off the  
17 record for the rest of today. We'll do that. Okay.

18 (Whereupon, the above-entitled matter  
19 concluded at 2:07 p.m.)  
20  
21  
22  
23  
24  
25

**Byron**



Byron Station, Units 1 and 2

**Braidwood**



Braidwood Station, Units 1 and 2

**License Renewal Application  
ACRS Full Committee Presentation  
September 10, 2015**

# Introductions

- Mike Gallagher VP, Exelon License Renewal
- John Bashor Braidwood Engineering Director
- Albert Piha LR Manager, Byron and Braidwood
- John Hufnagel Project Licensing Engineer

# Agenda

- Introductions Mike Gallagher
- Station Descriptions and Overview John Bashor
- GALL Consistency and Commitments Albert Piha
- Resolution of Open Items Albert Piha
  - EAF Screening Methodology
  - CRDM Housing Wear
- Items of Interest from Region III Inspections John Bashor
  - Visual Examination of Concrete Containment
  - CRDM Seismic Support Assembly
  - Flux Thimble
- Closing Remarks Mike Gallagher

# Byron and Braidwood Station Locations



Byron

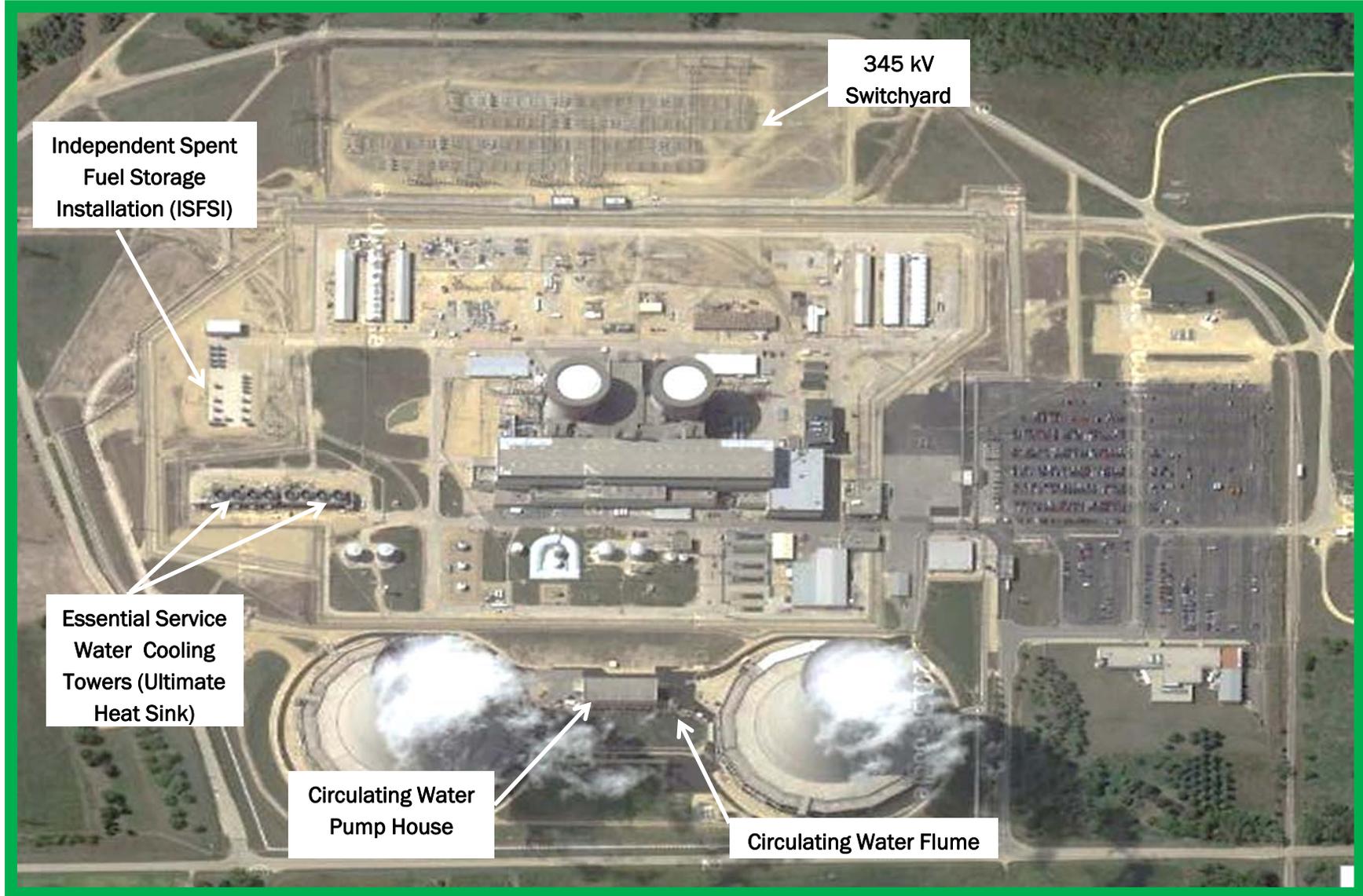
Braidwood

Illinois

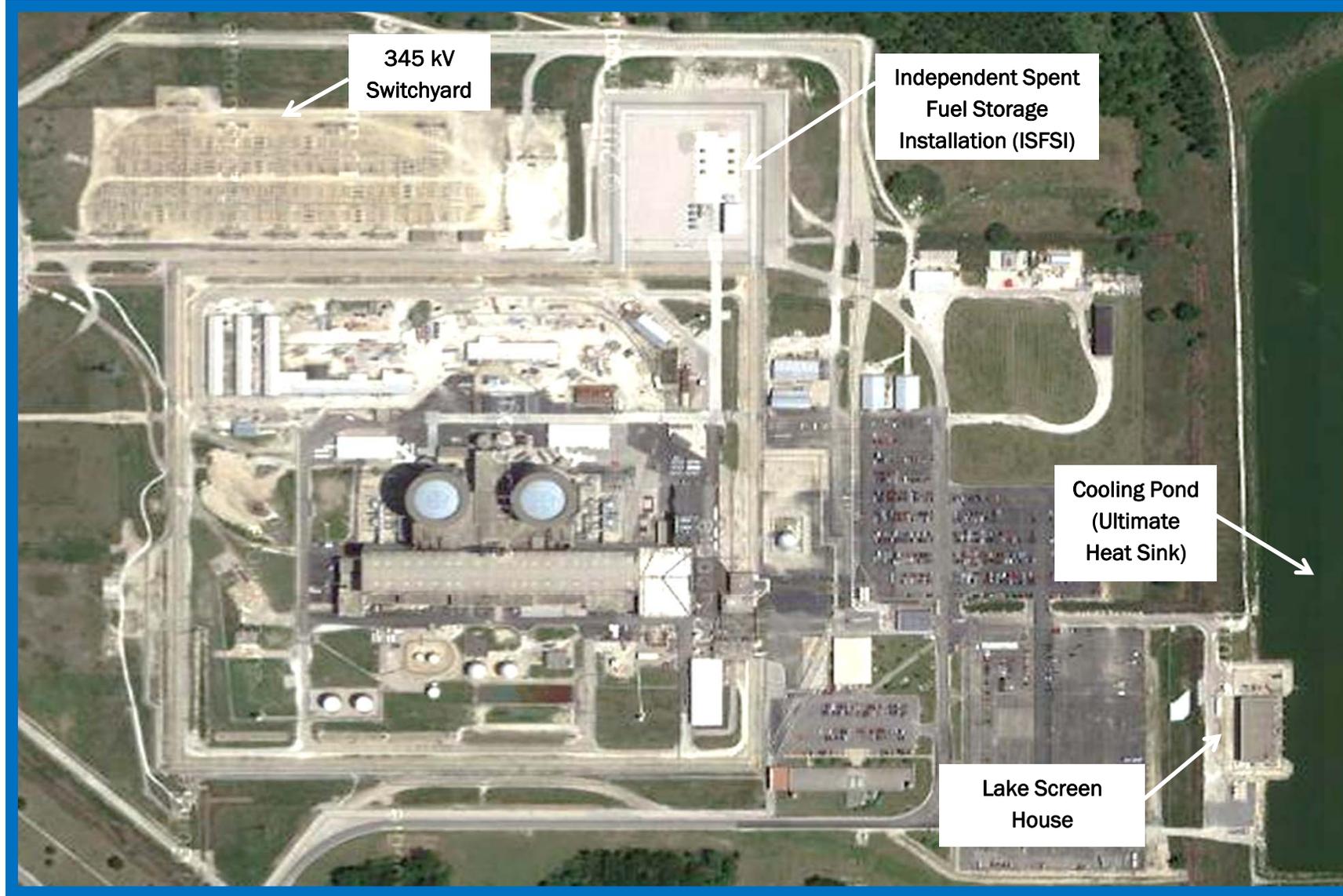
Byron Station, Units 1 and 2

Braidwood Station, Units 1 and 2

# Byron Station



# Braidwood Station



# Station Overview

|  | <u>Byron</u>  |               | <u>Braidwood</u> |               |
|--|---------------|---------------|------------------|---------------|
|  | <u>Unit 1</u> | <u>Unit 2</u> | <u>Unit 1</u>    | <u>Unit 2</u> |
| Initial License Date   | 10/31/84      | 11/06/86      | 10/17/86         | 12/18/87      |
| 5% Power Uprate to 3586.6 MW <sub>t</sub>                          | 2001          | 2001          | 2001             | 2001          |
| 1.63% Measurement Uncertainty Recapture (MUR) 3645 MW <sub>t</sub> | 2014          | 2014          | 2014             | 2014          |
| Steam Generator Replacement  | 1998          | -             | 1998             | -             |
| ECCS Recirculation Sump Screens                                    | 2006          | 2007          | 2007             | 2006          |
| Spent Fuel Rack Replacements                                       | 2000          |               | 2001             |               |
| Independent Spent Fuel Storage Installation (ISFSI)                | 2009          |               | 2011             |               |
| Current License Expiration Date                                    | 10/31/24      | 11/06/26      | 10/17/26         | 12/18/27      |

# GALL Revision 2 Consistency and License Renewal Commitments



**Byron Station, Units 1 and 2**



**Braidwood Station, Units 1 and 2**

## GALL Consistency and Commitments

- Submittal based on GALL, Revision 2
- License Renewal Commitments
  - UFSAR Supplement (Appendix A of the LRA)
  - Managed by Exelon Commitment Tracking program based on Nuclear Energy Institute 99-04, “Guidelines for Managing NRC Commitment Changes”

|                             | Byron | Braidwood |
|-----------------------------|-------|-----------|
| Total AMPs                  | 45    | 44        |
| AMPs Consistent with GALL   | 37    | 35        |
| AMPs with Exception to GALL | 8     | 9         |
| Commitments                 | 47    | 46        |

# Resolution of Open Items



**Byron Station, Units 1 and 2**



**Braidwood Station, Units 1 and 2**

## Resolution of Open Items

- **OI 4.3-1: Environmentally Assisted Fatigue (EAF)**
  - ✓ Provided information on leading component screening methodology and added locations to the list of leading equipment locations that will be monitored for the pressurizers and steam generators
- **OI 3.0.3.1.3-1: CRDM Nozzle Wear**
  - ✓ PWROG analysis concluded CRDM housings are acceptable with maximum wear
  - ✓ Exelon committed to perform UT examinations of the five centermost CRDM housings during the ten-year period prior to the PEO, and every ten years in the PEO

# Resolution of Region III Inspection Items of Interest



**Byron Station, Units 1 and 2**



**Braidwood Station, Units 1 and 2**

## Resolution of Region III Inspection Items of Interest

- Visual Examination of Concrete Containment Structures
  - ✓ Added commitment to require visual resolution capability for direct and remote examinations to be sufficient to detect concrete degradation at the levels described in Chapter 5 of ACI 349.3R
- CRDM Seismic Support Assembly (CRDM SSA) Aging Management
  - ✓ Added CRDM SSA to scope of IWF program for license renewal aging management

## Resolution of Region III Inspection Items of Interest

- Braidwood Flux Thimble Eddy Current Testing Program
  - ✓ Added commitment to resolve the recent difficulty in obtaining ECT data prior to PEO
  - ✓ Added commitment to replace a flux thimble tube every 2 refueling outages if required ECT data is not obtained for that tube
  - ✓ ECT data for all 58 Braidwood Unit 1 flux thimbles was obtained during recent Spring 2015 refueling outage

# Closing Remarks



# **Advisory Committee on Reactor Safeguards Full Committee Meeting**

## **Safety Evaluation Report Regarding Byron Station, Units 1 and 2, and Braidwood Station, Units 1 and 2**

September 10, 2015

John Daily, Sr. Project Manager  
Office of Nuclear Reactor Regulation

# Outline

- Recent completed Milestones
- Closure of Open Items
  - CRDM Nozzle Wear
  - Environmentally Assisted Fatigue in Class 1 Components
- Updates
  - Status of Byron 2 stuck closure stud
  - Issues arising from the 71002 Inspection
- Staff Conclusion for the Safety Evaluation

# Completed Milestones

- Safety Evaluation Report (SER) with Open Items issued October 30, 2014
- ACRS License Renewal Subcommittee Meeting held December 3, 2014
- All Open Items (OIs) for the SER are closed
- All 71002 Issues for the SER are resolved
- Final SER issued July 6, 2015

# Open Item Closure

## OI 3.0.3.1.3-1 CRDM Nozzle Wear:

- **Issue**: CRDM nozzle wear not adequately managed during PEO.
- **Basis for closure**: Applicant enhanced its ASME Section XI Inservice Inspection program to manage the CRDM penetration nozzle wear by volumetric examinations.

# Open Item Closure

## OI 4.3-1 Environmentally Assisted Fatigue in Class 1 Components:

- **Issue**: Insufficient justification for selecting leading locations
  - How one material bounds other materials
  - Basis for comparison of  $CUF_{en}$  values (screening out the higher  $CUF_{en}$  value)
- **Basis for closure**: Applicant Actions
  - Added the limiting locations of all materials back in to the list of monitored components
  - Refined stress basis analyses and showed that the chosen component is indeed the bounding location

# Closure Stud Update

## Reactor vessel head closure stud – Byron 2

- **Issue**: Closure stud #11 became stuck (2010), insufficient threads for tensioning
  - Top 5 in. cut off for clearance
- **Basis for Closure**: Applicant repaired stud #11
  - Commitment #47 completed

# Closure Stud Update

## Reactor vessel head closure stud – Braidwood 2

- **Issue**: Closure stud #35 became stuck (1991),  
RV stud hole damaged (2002)
  - Closure stud currently removed
- **Basis for closure**: Applicant committed to  
repair location and restore to fully operable
  - Staff will elevate this commitment (No. 48) to a  
license condition requiring restoration to operability  
prior to PEO

# Issues from 71002 Inspection

- CRDM seismic support assembly bolting (IWF)
- Visual examinations – containment concrete (IWL)
- Flux thimble tube inspections – Braidwood 1&2
  - Includes proposed license condition

## CRDM seismic support assembly bolting (IWF)

- **Issue:** LRA revision included CRDM Seismic Support Assemblies, but did not specify whether the assemblies include high-strength bolting greater than 1” diameter
- **Basis for resolution:** Aging management of high-strength bolting
  - CRDM seismic supports do not have high-strength bolting greater than 1” diameter
  - This issue is resolved

## Visual examinations of containment concrete (IWL)

- **Issue:** Visual inspections of some areas of concrete conducted remotely using an optical aid, yet may not allow adequate visual resolution ability
- **Basis for resolution:** Enhancement to ensure adequate visual resolution capability of optical aids to detect and quantify relevant findings against quantitative acceptance criteria.

## Flux Thimble Tube Inspection AMP

- AMP for Braidwood was initially found acceptable
- Staff reviewed LRA and OE
- Staff issued RAI
- Staff closed evaluation based on RAI response
- 71002 inspection identified new concerns

## Additional concerns from the 71002 Inspection

- AMP might not be adequate
- Continuing problems with tube examinations at Braidwood since 2012
- Efforts to correct the problems did not appear to be effective
- Indications that problems might be occurring at increasing rate

## Basis for resolution

### Applicant enhancement and commitment (No. 24):

- Tubes with wear replaced, removed from service unless successful eddy current testing obtained
- Inspect all tubes every refueling outage until data collected/plant-specific test frequency established
- Replace any tube after 2 cycles if data not obtained

### Staff resolution:

- Elevate commitment to license condition with 1 change
- Retain statements to replace/remove/successfully test
- Inspect all tubes at least every 2 refueling outages
- No tube to remain in service more than 2 cycles without successful data obtained

# Conclusion

On the basis of its review, the staff determines that the requirements of 10 CFR 54.29(a) have been met for the license renewal of Byron Station, Units 1 and 2, and Braidwood Station, Units 1 and 2.

# **Industry Comments on DC/COL-ISG-028**

## **Assessing the Technical Adequacy of the Advanced Light-Water Reactor Probabilistic Risk Assessment for the Design Certification Application and Combined License Application**

**Victoria Anderson, NEI**

ACRS Meeting

September 10, 2015



NUCLEAR ENERGY INSTITUTE

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# Background

- Draft ISG issued for comment in late 2014
  - Provides staff position on applicability of existing ASME/ANS PRA Standard to DC and COL plants
  - To be used for evaluation of technical adequacy of PRAs for new build plants one year prior to fuel load
- NEI provided comments on January 23, 2015
  - Focused on appropriateness of various supporting requirements for DC and COL applicants
  - Industry has not yet seen most recent draft of ISG

# Capability Category Treatment

- Focus of DC/COL-ISG-028 is on Capability Category (CC) I
  - Consistent with DC/COL-ISG-003, *PRA Information to Support Design Certification and Combined License Applications*
  - Section 4.c.: PRAs that meet the applicable supporting requirements for Capability Category I and meet the high level requirements as defined in the ASME PRA Standard (ASME-RA-Sb-2005) should generally be acceptable for DC and COL applications.
- Some Supporting Requirements (SRs) state “no action” to meet CC I
  - DC/COL-ISG-028 gives expectation to meet Capability Category II in some of these cases
  - Potentially contrary to DC/COL-ISG-003

# Potential for Improved Clarity

- DC/COL-ISG-028 unclear on “cannot meet” vs. “can meet” for use of generic and plant specific data
- References to using codes in “within known limits of applicability” should be expanded to included “within known or demonstrated limits of applicability”
- Beneficial to include more complete reference to applicability of LRF throughout the document
- Several SR clarifications noted “as-built” instead of “as-to-be-built”
- For several SRs, the ISG states that assumptions may be included for DCs, but assumptions may also be appropriate for COLs

# Conclusions

- DC/COL-ISG-028 addresses many DC/COL-specific considerations associated with implementation of the standard
- Critical to resolve issue of treatment of SRs with “no action” criteria for CC I
- Industry looks forward to reviewing disposition of comments

# Assessing the Technical Adequacy of the Advanced Light-Water Reactor Probabilistic Risk Assessment for the Design Certification Application and Combined License Application

DC/COL-ISG-028

ACRS Full Committee Briefing

September 10, 2015

# Presentation Outline

Background, Purpose, and Scope of DC/COL-ISG-028

General Topics of DC/COL PRA Standard Usage

SR-by-SR Evaluation Process

Summary of Comments and Dispositions

ACRS Subcommittee Considerations

Next Steps

# Background

PRA Standard (ASME/ANS RA-Sa-2009) endorsed in RG 1.200, Revision 2

- Developed based on current operating reactors
- Establishes high-level requirements (HLRs) and individual supporting requirements (SRs) for the “What” (aspects) of PRA; not the “How” (methods, approaches) of PRA
- Does not specifically address:
  - ALWR designs
  - Pre-operational phases (e.g., Part 52 licensing)
  - Large Release Frequency (LRF)

# Purpose of ISG

Provide consistent consideration of the PRA Standard in assessing the technical adequacy of the PRA needed for the Part 52 DC/COL applications

- Supplements RG 1.200, which currently endorses the PRA Standard (ASME/ANS RA-Sa-2009) for current operating reactors
- Will incorporate into RG 1.200, RG 1.206, and SRP 19.0, as appropriate, at next revision of these documents
  - Following issuance of next Edition of PRA Standard

Similar, but broader, effort being developed by ASME/ANS PRA Standard ALWR project team

# Scope of ISG

Use for PRA required for:

- DC Application per 10 CFR 52.47(a)(27)
- COL Application per 10 CFR 52.79(a)(46) & (d)(1)

Not for PRA required for:

- COL Holders/Licensees per 10 CFR 50.71(h)
  - PRA required by fuel load and beyond
- Risk-Informed Applications
  - ISI, TS, ILRT, etc.
- These PRAs and PRA applications should address the endorsed ASME/ANS PRA Standard, as appropriate for the application

Only addresses typical DC/COL application conditions

- Does not change current staff positions on approaches

# General Topics of DC/COL Usage of PRA Standard

Scope and Capability of PRA

PRA Configuration Control

Peer Reviews/Self Assessments

Operational Guidance and Practices

Large Release Frequency

Technical Challenges

# DC/COL Technical Challenges

Site-Specific Features and Characteristics

Screening Events/Hazards for Analysis

Plant-Specific Layouts/Capabilities

Plant-Specific Operating Experience and Data

Plant-Specific Guidance

Interviews

Walkdowns

Treatment of Uncertainties

# SR-by-SR Evaluation Process

ISG developed in a manner generally consistent with Section 1-3 of the PRA Standard – *Risk Assessment Application Process*

- *Identification of Application*
  - ***Application for a DC or COL***
- *Determination of Capability Categories*
  - ***Meet HLRs and Generally CC-I (with noted exceptions)***
- *Determination of the Standard's Scope and Level of Detail*

# *Determination of the Standard's Scope and Level of Detail*

Evaluate applicability of SR to DC and COL application stage

Evaluate feasibility of meeting SR at CC-I for DC and COL application stages

- Determine if clarification is needed or additional guidance is needed

# General SR Evaluation Outcomes

## Can Meet (75%)

- Aspects of SR may need to be clarified for DC/COL application stage

## Cannot Meet (5%)

- Aspects of SR may need to be performed - identified by comment/clarification

## Not Applicable (6%)

- SR is conditioned on an activity or input that does not exist or is not performed **OR**  
SR is not appropriate for ALWR
- Aspects of SR may need to be performed - identified by a comment/clarification

## Replace (1%)

- SR is not appropriate for ALWR and a modified/different requirement is needed

## Enhance (11%)

- SR needs to be supplemented to address DC/COL application stage conditions

## New (2%)

- No SR addresses the specific topic for which a requirement is needed

# Comments on Draft ISG

Draft ISG issued for Use and Comment in November 2014

1 set of comments received (submitted by NEI)

- 49 specific comments
- Staff agreed with 37 comments and made changes as appropriate
- For 7 of the 12 comments the staff disagreed, the staff incorporated clarifications or changes

Also considered

- 2014 Subcommittee discussions on Draft ISG
- Internal comments/edits
- Similar, but different, effort being pursued in PRA Standards community (developing appendix to address the PRA Standard for ALWRs in the pre-operational phase)

# Summary of Industry Comments

## 24 – Edits/Clarifications/Consistency/Corrections

- Editorial/ALWR Terminology (10)
- Consistency (7)
- Clarifications (5)
- Corrections (2)

## 15 – Assumptions/Uncertainty/Limitations

- COL assumptions (11)
- Uncertainty documentation (2)
- Limitations in peer reviews (1)
- Limitations in computer codes used (1)

## 10 – Screening Initiating Events/Hazards/Components

- IE-C6 (3), EXT-B1 (2), IFSN-A13-16 (4), SFR-E2

# Summary of SRs with Designation Changes from Draft to Final ISG

| SR     | Draft          | Final          | Main Influence             |
|--------|----------------|----------------|----------------------------|
| IE-A4  | Not Applicable | Can Meet       | ACRS/PRA Standard/Internal |
| IE-A7  | Not Applicable | Can Meet       | ACRS/PRA Standard/Internal |
| SY-A19 | Cannot Meet    | Can Meet       | Industry                   |
| SY-A20 | Cannot Meet    | Can Meet       | Industry                   |
| HR-E3  | Cannot Meet    | Can Meet       | ACRS                       |
| DA-C4  | Cannot Meet    | Not Applicable | PRA Standard/Internal      |
| DA-C12 | Can Meet       | Not Applicable | PRA Standard/Internal      |
| DA-C13 | Can Meet       | Not Applicable | PRA Standard/Internal      |
| DA-C14 | Cannot Meet    | Can Meet       | Industry                   |
| QU-D8  | -              | New            | Industry                   |
| LE-F2  | Can Meet       | Enhance        | Industry                   |

# Summary of SRs with Designation Changes from Draft to Final ISG

| SR          | Draft          | Final          | Main Influence        |
|-------------|----------------|----------------|-----------------------|
| IFSN-A14    | Not Applicable | Replace        | PRA Standard/Internal |
| IFSN-A15/16 | Not Applicable | Replace        | PRA Standard/Internal |
| IFQU-A3     | Not Applicable | Can Meet       | Industry              |
| IFQU-A12    | -              | New            | Industry              |
| ES-B1       | Cannot Meet    | Can Meet       | Internal              |
| PRM-B2      | Not Applicable | Can Meet       | ACRS                  |
| IGN-B4      | Can Meet       | Not Applicable | Internal              |
| QNS-C1      | Not Applicable | Enhance        | Industry              |
| HRA-A4      | Cannot Meet    | Can Meet       | ACRS                  |
| SHA (all)   | Can Meet (COL) | Not Applicable | Industry              |
| WFR-A1      | Can Meet       | Cannot Meet    | Internal              |
| XFFR-A1     | Can Meet       | Cannot Meet    | Internal              |

# ACRS Subcommittee Considerations

Staff identified 3 main takeaways from the August 21, 2015 ACRS Subcommittee meeting

- Seismic Margins Analysis versus Seismic PRA at COL Application Stage
- Scope/Objective to Address Capability Category I versus Capability Category II
- Designations of Cannot Meet or Not Applicable when Action Still Expected

# Seismic Margins Analysis versus Seismic PRA at COL Application Stage

PRA-based SMA allowed as part of SRM on  
SECY-93-087 and reflected in DC/COL-ISG-020 and  
SRP 19.0

Management is contemplating if a change in policy  
should be considered

The ISG will move forward with current position;  
recognizing it may need to be revised if Commission  
changes position

# Scope/Objective to Address Capability Category I versus Capability Category II

Capability Category I identified as generally acceptable for applications for DC and COL in DC/COL-ISG-003 and SRP 19.0

- ACRS/staff have exchanged memos on this topic in context of SRP 19.0, Revision 3

Staff has performed evaluations of SRs for differences in Capability Categories

# Summary of SRs comparing CC-I to CC-II

686 SRs in ISG

544 SRs are the same between CC-I and CC-II

142 SRs are different between CC-I and CC-II

- 34 SRs not defined or have no requirement at CC-I
  - ISG approach evaluated if CC-II should be addressed
- 18 SRs Cannot Meet or Not Applicable at CC-I
- 8 SRs become the same as CC-I using general clarifications
- 5 SRs CC-II not achievable at DC/COL, while CC-I is achievable
- 77 SRs achievable at DC/COL at CC-II

# Scope/Objective to Address Capability Category I versus Capability Category II

Management supports maintaining the current staff position that CC-I is generally acceptable for these applications

- Recognizes that where CC-I is not defined or does not have a requirement, the ISG considered CC-II
- Scope of ISG limited to application for DC and COL

The ISG will move forward with current position

# Designations of Cannot Meet or Not Applicable when Action Still Expected

686 SRs

- 80 are Cannot Meet or Not Applicable
- 606 are Can Meet, Replaced, Enhanced, or New

50% of Cannot Meet or Not Applicable include a clarification that identifies actions that still need to be performed

- Public Comment also was received on confusion regarding these designations that included clarifications

Management agrees with changing the approach so that it identifies the SRs with Qualifications and Clarifications

The ISG will move forward after making this change

# Next Steps

Completed all administrative steps for issuance

Will make changes resulting from the ACRS Subcommittee meeting

- Change to Qualifications/Clarifications approach

Issue final ISG for use in late 2015/early 2016

# Acronyms

|        |  |
|--------|--|
| ALWR   | Advanced Light-Water Reactor                 |
| ANS    | American Nuclear Society                     |
| ASME   | American Society for Mechanical Engineers    |
| CC     | Capability Category                          |
| CDF    | Core Damage Frequency                        |
| COL    | Combined License                             |
| DC     | Design Certification                         |
| HLR    | High Level Requirement                       |
| ISG    | Interim Staff Guidance                       |
| ISLOCA | Interfacing Systems Loss of Coolant Accident |
| LERF   | Large Early Release Frequency                |
| LRF    | Large Release Frequency                      |
| PRA    | Probabilistic Risk Assessment                |
| RG     | Regulatory Guide                             |
| SMA    | Seismic Margins Analysis                     |
| SR     | Supporting Requirement                       |
| SRP    | Standard Review Plan                         |
| SSC    | Structures, Systems, and Components          |