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                                  Plant License Renewal Subcommittee

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

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2 NUCLEAR REGULATORY COMMISSION

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4 ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

5 (ACRS)

6 PLANT LICENSE RENEWAL SUBCOMMITTEE

7 KEWAUNEE POWER STATION

8 + + + + +

9 WEDNESDAY,

10 AUGUST 18, 2010

11 + + + + +

12 ROCKVILLE, MARYLAND

13 + + + + +

14 The Subcommittee met at the Nuclear  
15 Regulatory Commission, Two White Flint North, Room  
16 T2B1, 11545 Rockville Pike, at 8:30 a.m., Mario  
17 Bonanca, Chairman, presiding.

18 SUBCOMMITTEE MEMBERS:

19 MARIO V. BONACA, Chairman

20 J. SAM ARMIJO, Member

21 CHARLES H. BROWN, Member

22 WILLIAM J. SHACK, Member

23 JOHN W. STETKAR, Member

24

25

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1 DESIGNATED FEDERAL OFFICIAL:

2 GIRIJA S. SHUKLA

3 CONSULTANT:

4 JOHN J. BARTON

5 NRC STAFF:

6 BRIAN HOLIAN, NRR

7 JOHN DAILY, NRR

8 DAVID PELTON, NRR

9 BILL ROGERS

10 CAROLINE TILTON, Region III

11 DOMINION ENERGY KEWAUNEE:

12 PAUL AITKEN

13 PHIL BUKES

14 MIKE HALE

15 MARK HOTCHKISS

16 JIM RUSCH

17 BEN RODILL

18 STEVE SCASE

19 CHARLIE SORRELL

20 BILL WEBSTER

21 MICHAEL WILSON

22 DAVID WOOTEN

23 STEW YUEN

24

25

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

(8:28 a.m.)

OPENING REMARKS

CHAIRMAN BONACA: I am Mario Bonaca,  
Chairman of the subcommittee for this application.

The committee members that are present are Bill Shack,  
John Stetkar, Sam Armijo. We have two consultants,  
well one consultant, John Barton, and we may have  
additional members as we go forward.

Mr. Girija Shukla with the ACRS is the  
designated federal official for the meeting.

The subcommittee will review the license  
renewal applications for the Kewaunee Power Station  
and the associated NRC staff. We will hear  
presentations from the NRC staff and Dominion Energy,  
Kewaunee representatives, and other interested persons  
regarding this matter.

We have received no written comments or  
requests for time to make oral statements from members  
of the public regarding to today's meeting. The  
meeting will be open to public attendance.

The committee will gather information and  
analyze relevant issues and facts and formulate  
proposed positions and actions as appropriate for  
deliberation at the full committee. Rules for

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1 participation in today's meeting have been announced  
2 as part of the notice of this meeting published in the  
3 Federal Register of July 29<sup>th</sup>, 2010.

4 A transcript of the meeting is being kept  
5 and will be made available as stated in the Federal  
6 Register notice. Therefore we request that  
7 participants in this meeting use the microphones  
8 located throughout the room when addressing the  
9 subcommittee. The participants should first identify  
10 themselves, speak with sufficient clarity and volume  
11 so that they may be easily heard.

12 We will now proceed with the meeting, and  
13 I call upon Mr. Brian Holian of the NRR to make  
14 introductory remarks.

15 STAFF INTRODUCTION

16 MR. HOLIAN: Thank you, Chairman, and good  
17 morning, committee.

18 My name is Brian Holian. I'm the director  
19 of the Division of License Renewal. The agenda for  
20 this morning's meeting is, I'll just brief  
21 introductions and turn it over to the licensee,  
22 Dominion Energy, for the Kewaunee presentation,  
23 followed by a break and then the NRC presentation on  
24 the issues.

25 To my right is Mr. John Daily. He's the

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1 senior project manager for the Kewaunee project. He's  
2 also previously worked on Pilgrim and TMI projects,  
3 and this will be his first presentation to the ACRS.

4 Behind him is Ms. Caroline Tilton. She is  
5 the senior reactor inspector from Region 3, Division  
6 of Reactor Safety. She was the team leader, and you  
7 will hear from her later on, on inspection results.

8  
9 Also behind me is Jay Robinson. He's the  
10 branch chief responsible for John and this project.

11 And I wanted to mention two other acting  
12 branch chiefs who have been in the office of license  
13 renewals during part of the Kewaunee review. One is  
14 Girijua Shukla from ACRS who is over for a several  
15 month rotation. So we were thankful for that  
16 opportunity that he had to come over.

17 And also Mr. Steve Cochran immediately  
18 behind me. Steve has been in for the last month.  
19 He's from the technical training center and has come  
20 up to ground his experience in license renewal for a  
21 good month. He's in charge of the simulators there  
22 and has taken over one of our tech branches for the  
23 last month.

24 With that introduction, we have other  
25 staff we might hear from later, I just wanted to

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1 briefly pause on two of the open items out of the four  
2 that the licensee will present and we'll comment on.

3 One is the steam generator divider plate,  
4 probably a new item for the ACRS as you look at that.

5 And I just wanted to mention it's not Kewaunee  
6 specific. It's interesting how it comes up out of  
7 kind of foreign experience. It's an item the staff  
8 has just deemed worth looking at, and that's why it  
9 happens to be open now. The industry has been aware  
10 of it through the steam generator EPRI groups and in  
11 license renewal we've raised it during this review as  
12 an item we thought worth looking at.

13 The second item that I wanted to talk on  
14 just briefly, and we'll hear more quotes from the  
15 licensee and then our staff later, is the work control  
16 process. You haven't seen that in probably the last  
17 year and a half as an open item. It was an item on  
18 previous plants, namely the Dominion fleet back at  
19 Millstone and North Anna, they used the work control  
20 process for substitute for one-time inspections.

21 The staff from what I understand  
22 historically has always looked at that with a guarded  
23 eye on your using a current practice but does it have  
24 the mechanisms of an aging management program. And on  
25 Kewaunee they expanded the use from what we have seen

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1 in the past.

2 So we are looking through those issues  
3 with them, and making sure their program has what we  
4 think is necessary.

5 So with that background I'll turn it over  
6 to Mr. Steve Scace, the vice president for Kewaunee.

7 DOMINION ENERGY/KEWAUNEE PRESENTATION

8 MR. SCACE: Thank you, Mr. Holian.

9 Good morning, Mr. Chairman, subcommittee  
10 members, and the NRC staff in attendance.

11 We appreciate the opportunity to discuss  
12 our safety evaluation with the subcommittee as well as  
13 to briefly describe the Kewaunee Power Station, its  
14 current status, our license renewal process and other  
15 items of interest.

16 We have an experienced team here today  
17 from both our station and our nuclear corporate  
18 headquarters located outside of Richmond, Virginia.  
19 I'd like to introduce them.

20 First of all, Alan Price is sitting in the  
21 back. He's our engineering vice president.

22 Mike Wilson to my left is our director of  
23 safety and licensing at Kewaunee.

24 Stew Yuen to my right is the director of  
25 engineering at Kewaunee.

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1           And Paul Aitken to Mike's left is our  
2 license renewal project manager.

3           We have brought a number of other folks  
4 here to ensure that any questions you have we can  
5 readily answer today.

6           Kewaunee is part of the Dominion fleet.  
7 The North Anna power station and the Surrey power  
8 station in Virginia and Millstone power station in  
9 Connecticut are our other stations.

10           Kewaunee became part of the Dominion fleet  
11 in July, 2005, when we purchased the station from  
12 Wisconsin Public Service. It had been operated by  
13 Nuclear Management Corporation prior to that.

14           Dominion's focus from the beginning was to  
15 operate Kewaunee safely and reliably through extended  
16 plant life. We therefore have invested significantly  
17 in both adding and developing talented personnel, and  
18 investing over \$250 million in capital improvements by  
19 the end of the year 2010.

20           Mr. Yuen will shortly describe some of  
21 these improvements that we have made.

22           This investment has paid dividends as  
23 shown in our recent performance both in safety and  
24 reliability. For example over the last three years we  
25 have risen from one of the lowest-performing plants as

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1 measured by the IMP performance indicator to among  
2 those at the top.

3 Being part of the fleet clearly has its  
4 advantages. For example the license renewal team  
5 headed by Mr. Aitken conducted the license renewal  
6 projects for our other three stations.

7 We are mindful of and will meet our  
8 commitments made as a result of license renewal. We  
9 have the resources both at the station and available  
10 from the fleet to do so.

11 Once again it's a pleasure to be here, and  
12 unless there are any questions for me I will turn it  
13 over to Mike Wilson.

14 MR. WILSON: You can see our presentation  
15 agenda for today. I will give you some basic  
16 information about the plant and its location; some  
17 information about our renewal project including its  
18 commitments; and also discuss some technical items  
19 including the open items that exist within the draft  
20 SER.

21 Kewaunee County is located in northeast  
22 Wisconsin on the western shore of Lake Michigan, and  
23 Lake Michigan is our ultimate heat sink. You can see  
24 that there were a Westinghouse PWR and also with a  
25 Westinghouse turbine generator.

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1 Our containment has a sealed containment  
2 vessel with a concrete shield building. There is an  
3 annulus space between the steel containment and the  
4 concrete shield building of about seven feet. That  
5 allows us to access the outside of the steel  
6 containment, and we do inspections of that 100 percent  
7 of the accessible portions every two consecutive  
8 refueling outages, a little bit different design for  
9 containment.

10 CONSULTANT BARTON: Do you have an  
11 overhead or something that shows that that would show  
12 where you found the rusting containment and the  
13 moisture barrier, and has the moisture barrier  
14 inspection revealed any deterioration of the barrier?

15 MR. SCACE: We have a general outline of  
16 the containment and we can point out that. That is  
17 the general --

18 MR. SAUL: I am Charlie Saul. I'm with  
19 the applicant, lead superstructure on the project.  
20 The - like he said the containment is a stand-alone  
21 reactor containment vessel, and it's housed inside of  
22 a shield building. And there is an annulus gap around  
23 the outside of that.

24 CONSULTANT BARTON: Is that containment  
25 painted on the outside or coated with anything or is

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1 it just bare skin?

2 MR. SAUL: It is painted on the outside.

3 CONSULTANT BARTON: Now where was this  
4 rust found? And where is your moisture barrier? And  
5 has that moisture barrier got any deterioration in it?  
6 I'm trying to understand. Where did you find the  
7 rust?

8 MR. BUKES: Phil Bukes for the applicant.  
9 WE found three areas of rusting. They were all in  
10 the annulus. One was below the equipment hatch. The  
11 other one was to the right and below the personnel  
12 hatch. And the third area was below the service water  
13 piping.

14 CONSULTANT BARTON: So they were all on  
15 the outside of containment in the air gap area?

16 MR. BUKES: That is correct.

17 CONSULTANT BARTON: Didn't find anything  
18 inside?

19 MR. BUKES: No.

20 CONSULTANT BARTON: And the moisture  
21 barrier is intact, and there is no deterioration of  
22 the moisture barrier?

23 MR. BUKES: There has been minor  
24 deterioration of the moisture barrier, mostly just  
25 tearing in the caulking.

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1                   CONSULTANT BARTON: That's been taken care  
2 of?

3                   MR. BUKES: Yes.

4                   CONSULTANT BARTON: Thank you.

5                   MEMBER SHACK: When you say you inspect  
6 100 percent of the accessible I assume you mean you  
7 are not inspecting down in the concrete, the buried  
8 stuff. But you really can - what is your mechanism  
9 for doing the visual inspections of everything outside  
10 the concrete? Is this all line of sight, or are you  
11 using cameras?

12                  MR. BUKES: No, we use binoculars,  
13 cameras. We try to get up into - we have access to  
14 100 percent of the annulus area by ladders and  
15 scaffolding, scaffolding and walkways, and inside  
16 containment we just use binoculars.

17                  CONSULTANT BARTON: Okay.

18                  MR. WILSON: I am showing you a map of the  
19 location of the plant. I'll point out two things.  
20 Notice the proximity of Green Bay, Wisconsin. It's  
21 about 20 miles from the plant. Also the proximity of  
22 Point Beach dual units, about five miles from Kewaunee  
23 Power Station to the south, operated by Florida Power  
24 & Light.

25                  Here are some milestones within the

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1 plant's history. Notice the updates in power from  
2 both measure and search and recapture in 2003,  
3 followed by a stretched update in 2004, and a key  
4 milestone for us was the operating license expiring in  
5 December of 2013. The original license, by the way,  
6 was 1,650 Megawatts thermal. It's been updated the  
7 two times to 1,772 megawatts thermal.

8 The plant is operating safely and reliably  
9 during cycle #31, in part because of the improvements  
10 we have made in the equipment and reliability. You  
11 notice it's over three years since our last automatic  
12 trip. And we describe and discuss some of those  
13 improvements in equipment reliability. I'll turn it  
14 over to our engineering director, Steve Yuen.

15 MR. YUEN: Good morning. Next couple of  
16 slides I'll be discussing some of the major  
17 improvements. Specifically on this slide the first  
18 two bullets are related to the replacement of copper  
19 alloy tubing. The main condenser feedwater heaters  
20 with stainless steel tube material. This was done  
21 due to ammonia reduction in the original copper alloy  
22 tubes and to reduce the impact of copper problems  
23 associated with the steam generators.

24 The next bullet I wanted to speak to was  
25 the steam generator replacement.

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1 MEMBER SHACK: Just out of curiosity, did  
2 that let you change the pH of your system so you could  
3 get some protection from erosion-corrosion? No?

4 MR. HALE: Mike Hale for the applicant.  
5 Yes, we moved to a hydrazine and dimethylamine  
6 chemistry.

7 MEMBER SHACK: What is your secondary site  
8 pH now, do you know?

9 MR. HALE: I don't have that information  
10 with me.

11 MEMBER SHACK: Just somebody with water  
12 chemistry, somewhere there is a document that says  
13 something about hydrogen peroxide additions to the  
14 reactor coolant. Why?

15 MR. HALE: Yes, sir, we do that during our  
16 shutdown to stimulate a crud burst so that we have a  
17 crud burst when we want it.

18 MEMBER SHACK: Oh, that will certainly do  
19 it. Okay.

20 MEMBER ARMIJO: As long as we are talking  
21 about water chemistry, your condenser tubes were they  
22 admiralty brass or monel?

23 MR. SCACE: They were admiralty brass  
24 originals.

25 MEMBER ARMIJO: Okay, and did you ever

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1 have any problems with your fuel related to the proper  
2 getting into the primary system?

3 MR. YUEN: No, we have not had any fuel  
4 failures I believe in about 30 years.

5 MEMBER ARMIJO: That's good performance  
6 there. Okay, thank you.

7 MR. YUEN: Could you go to the steam  
8 generator slide? The steam generators were replaced  
9 in 2001. As this slide shows the replacement  
10 consisted of essentially a two section evolution. The  
11 upper package was the original and it was refurbished  
12 with quality improvements. The discharge nozzle was  
13 fitted with a steam flow limiter, moisture separators  
14 were upgraded, and the feed ring J-tubes were replaced  
15 with frac resistant materials.

16 MEMBER SHACK: Was this economics, or was  
17 this to avoid cutting a hole in the containment or  
18 both?

19 MR. YUEN: With respect to the way we did  
20 it?

21 MEMBER SHACK: The way you did it this  
22 way, instead of a whole new steam generator.

23 MR. YUEN: Well, it's not unique. It had  
24 been done previously this way. As far as the cutting,  
25 there was essentially interference for removal, so

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1 that is ultimately why we opted to go the way we did.

2 The lower package was completely replaced  
3 with the following improvements: the tubes were  
4 replaced with stress corrosion cracking resistant  
5 thermally treated alloy 690 tube material. The  
6 support plates were changed from carbon steel to  
7 stainless steel with a quatrefoil tube hole design  
8 which reduces the likelihood of tube denting, due to  
9 corrosion, product buildup around the tubes, and in  
10 addition, the divider plate on the primary side was  
11 changed to alloy 600 with welded alloy 690 material.  
12 And we will actually be discussing that later in the  
13 presentation.

14 MEMBER SHACK: You got three out of four  
15 right. (Laughter)

16 MR. YUEN: So as I said, this type of  
17 generator replacement is not unique to the industry  
18 with Dominion plants previously having done it, both  
19 Surrey and North Anna as well as others in the  
20 industry.

21 And the last thing I wanted to touch on in  
22 this slide was the reactor head replacement. The  
23 reactor vessel head was replaced due to industry  
24 issues of penetration leaks. The key changes were  
25 elimination of potential leakage paths, events and

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1 canopy seal welds. We improved penetration material.

2 We changed from alloy 600 to alloy 690. Our  
3 conoseals were replaced with assemblies, and we also  
4 improved our inspection capabilities by having metal  
5 reflective insulation with inspection ports installed.

6 Next slide.

7 On this slide --

8 CONSULTANT BARTON: Are you going to show  
9 us which yard, what you're doing?

10 MR. YUEN: Yes, I am.

11 CONSULTANT BARTON: All right, thank you.

12 MR. YUEN: On this slide the - want to  
13 talk briefly about the pump replacements and then the  
14 switchyard improvements. Our reactor coolant pumps,  
15 we have replaced both of them. This was due to shaft  
16 cracking issues I believe that occurred at some TVA  
17 plants. We did inspect both of the shafts, our  
18 first pump shaft that was replaced and inspected.  
19 There was no evidence of any cracking. The second  
20 shaft that we replaced did have some very shallow  
21 cracking. And the new pump shafts are designed to  
22 preclude that type of racking from occurring.

23 CONSULTANT BARTON: It's different  
24 material?

25 MR. YUEN: Different material, some

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1 actually removal of some stress risers in the shaft.

2 CONSULTANT BARTON: Okay.

3 MR. YUEN: So yes.

4 The other pump replacement I want to talk  
5 about briefly is service water pumps. We have  
6 replaced those with an improved design that has  
7 eliminated a need for strain bearing lubrication  
8 cooling. The bearings are now cooled by the -  
9 directly by the pump flow. The impeller material has  
10 also changed to stainless steel to reduce wear due to  
11 pumping raw Lake Michigan water.

12 Finally the last two bullets, if we could  
13 go to the next slide. Got two slides here. One shows  
14 our switchyard layout in 2006, and then the next one  
15 will show the switchyard once all the modifications  
16 that we are performing are complete. But this first  
17 slide shows, as you can see there are two 138 kV lines  
18 or kV buses on the left side of this drawing, and two  
19 345 kV lines to Point Beach and North Appleton.

20 One of these station offsite power  
21 sources, the tertiary aux transformer, it's denoted by  
22 the acronym TAT, in the middle of the drawing there,  
23 was fed directly from a tertiary winding on the 345  
24 and 138 kV transformer. The other offsite power  
25 supply, the reserve aux transformer which is denoted

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1 at the bottom there by the acronym, RAT, was being  
2 fed by either of the 138 kV buses.

3 And finally the generator output breaker  
4 fed the 345 kV bus.

5 So the modifications that we are doing, as  
6 you can see from this slide, include the following  
7 improvements. When all the modifications are complete  
8 we will have a double ring bus for both the 138 kV bus  
9 as well as the 345 kV bus. We are replacing or  
10 actually we have replaced the TAT with a new  
11 transformer and our RAT will be replaced in our  
12 upcoming refueling outage.

13 We have also replaced our main generator  
14 step-up transformers, and we have added a second 345  
15 to 138 kV transformer - or I'm sorry, we will be  
16 adding that this refueling outage.

17 We have also added new supply transformers  
18 as you will see on the bottom of that drawing, RST  
19 with LTC, to both the RAT and the TAT. That LTC is a  
20 low tap changer capability, and that will be  
21 functional following our 2011 refueling outage.

22 Finally the generator output breaker will  
23 feed the ring bus through additional breakers to the  
24 ring bus. These changes will improve and have  
25 improved actually the reliability of the offsite power

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1 source through diverse redundant means, allows the  
2 safety buses to maintain voltage during periods of  
3 normal grid fluctuation through the new RAT and TAT  
4 supply transformers that have the low TAT changer  
5 capability, and also improves our maintainability of  
6 switchyard equipment through the additional breakers  
7 that have been installed.

8 CONSULTANT BARTON: Now who owns the  
9 switchyard, you or the power company?

10 MR. YUEN: It's actually split. Part of  
11 it is owned by us, and there is a part that is owned  
12 by the transmission company.

13 CONSULTANT BARTON: The transmission  
14 company does maintenance on their portion?

15 MR. YUEN: Correct.

16 CONSULTANT BARTON: How do you control  
17 what they do?

18 MR. YUEN: We actually have through the  
19 NERC/FERC agreements, there are agreements that we  
20 have set up with the transmission company on how they  
21 notify us when they are coming in to do maintenance  
22 and how that is all controlled.

23 CONSULTANT BARTON: Thank you.

24 MEMBER STETKAR: Stuart, this drawing  
25 you're showing here was not in the license renewal

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1 application; is that correct?

2 MR. YUEN: That is correct. This is just  
3 for presentation purposes.

4 MEMBER STETKAR: Well, okay, then on this  
5 drawing there is some nice red lines and there are  
6 some nice blue lines. What specific equipment is in  
7 scope for license renewal on this drawing if this is  
8 indeed the configuration that will be in effect at the  
9 time of license renewal?

10 MR. AITKEN: We do have another drawing we  
11 can go to.

12 MEMBER STETKAR: You do? Okay, I can  
13 wait.

14 I can read this but let's go back to the  
15 other one; it's a lot easier for most folks to  
16 understand.

17 MR. AITKEN: Essentially the scoping  
18 boundary remains the same at this point in time. We've  
19 changed out a breaker from the oil fill breaker to the  
20 gas fill breaker and offset breaker. So the boundary  
21 remains at that breaker.

22 MEMBER STETKAR: Could you go back to the  
23 as-is drawing then?

24 MR. AITKEN: Go back to the other or to  
25 this drawing?

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1                   MEMBER STETKAR:     This is the drawing  
2 essentially that is in the license renewal  
3 application. I mean electrically.

4                   MR. AITKEN:     Well, just for purposes of  
5 illustration the boundary remains essentially  
6 unchanged at this point in time. We've done a lot of  
7 work out in the switchyard, but we are not to the  
8 first active breaker and to the switcher. That  
9 configuration hasn't changed.

10                  MEMBER STETKAR:    Okay. But it's basically  
11 RAT/TAT out to the first active breaker, dual breakers  
12 out in the switchyard?

13                  MR. AITKEN:     That's correct.

14                  MEMBER STETKAR:    Okay.

15                  MEMBER SHACK:     Just before you go on to  
16 license renewal, I was looking through the Sanna  
17 document, and I was just curious, you've made a lot of  
18 changes to reduce your susceptibility to internal  
19 flooding, and it's dropped your CDF by almost an order  
20 of magnitude, but every time you made a change that  
21 reduced the CDF the LERF kept going up. And I was  
22 wondering if that was just due to modeling changes, or  
23 was there something that I don't understand going on?  
24 I wonder if anybody could --

25                  MR. AITKEN:     Bill, can you field that

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1 question?

2 MR. WEBSTER: Yes, I am Bill Webster with  
3 the Dominion.

4 Every time the internal flooding the LERF  
5 was dominated primarily by steam generator tube  
6 ruptures, and just the contribution of the flooding  
7 didn't affect LERF, so LERF essentially --

8 MEMBER SHACK: I can understand it not  
9 changing. I had a little trouble with it going up.

10 MR. WEBSTER: I'd have to look at the  
11 specific modeling to give you the exact answer to  
12 that. I don't know the answer to that right off, but  
13 we can get back to you on that.

14 MR. YUEN: So at this time if there are no  
15 other questions I'm going to turn it over to Paul  
16 Aitken.

17 MR. AITKEN: Okay, thanks.

18 Again, I'm Paul Aitken. I'm the project  
19 manager for the Kewaunee project. And as Steve  
20 mentioned I was involved in the Millstone/Surry/North  
21 Anna license renewal projects as well.

22 So I'll provide an overview of the license  
23 renewal project, and then cover a couple of technical  
24 items of interest as well as cover the four open items  
25 that are currently reflected in our draft SER.

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1 First I want to mention that we were able  
2 to staff the Kewaunee project with a very experienced  
3 team, with several years of license renewal experience  
4 stemming all the way back to the Surry/North Anna  
5 projects over 10 years ago.

6 The majority of the team is located in  
7 corporate offices, as Steve mentioned, but we also  
8 complemented the team with Kewaunee staff including  
9 two retired shift operation managers.

10 Throughout the project the license renewal  
11 team coordinated with their respective station subject  
12 matter experts in identifying operating experience as  
13 well as in reviewing many of our project technical  
14 reports, including the aging management program basis  
15 documents.

16 We also were very active during the  
17 license renewal outage as well as the regional  
18 inspection.

19 I wanted to also emphasize that we always  
20 remained engaged with the industry mainly through the  
21 NEI license renewal working group and the various  
22 discipline-based EPRI working groups over the last 10  
23 - 11 years. This involvement has allowed us to remain  
24 in touch with the ongoing industry initiatives.

25 The last item that I will mention is that

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1 Dominion has been directly involved with the review  
2 and input related to the first version and the current  
3 revision. This has been important to be part of this  
4 process along with our industry counterparts and show  
5 that the GALL reflected the latest information related  
6 to aging evaluations and aging management.

7 I'll move on to scoping and screening.  
8 It's a high level discussion here. The scoping  
9 process is pretty standard. We follow the guidance in  
10 NEI 95-10 revision 6. Through our process we  
11 categorized the entire plant in terms of major  
12 systems, structures and components, and we try to stay  
13 as close as practical to the existing plant's system  
14 nomenclature.

15 We used site component databases, control  
16 drawings and other designs and licensing documents to  
17 perform our scoping reviews.

18 For the in scope systems and structures,  
19 screening was performed to determine what equipment  
20 needed to be evaluated further for aging management.  
21 We performed our aging management reviews using  
22 industry guidance documents as well as using the  
23 experience from our previous license renewal projects.

24 We identified potential aging effects through the  
25 various discipline-based EPRI tools, GALL, and our own

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1 plant specific OE. Overall we had roughly 85 percent  
2 alignment with the GALL document in the aging  
3 management review section of the LRA.

4 CONSULTANT BARTON: Considering you said  
5 the experienced team you put together I was  
6 disappointed in your scoping screening. I saw more  
7 RAIs on scoping and screening, mismarked drawings and  
8 mislabeled components than I have in a lot of recent  
9 applications, and I just thought the quality of the  
10 scoping and screening was not as good in this  
11 application as I've seen in recent applications, and I  
12 see them all.

13 MR. AITKEN: I think the challenge as far  
14 as what was brought into scope. I thought there were  
15 a lot of continuation questions on the different  
16 drawings that we tried to work.

17 CONSULTANT BARTON: There were just an  
18 awful lot of RAIs on that.

19 MR. AITKEN: Yes. Next slide.

20 Let's transition now to TLAs. We do have  
21 to take a look at time-limited aging analysis under  
22 the regulations, in case our existing analysis relies  
23 on a component of time to determine its adequacy. We  
24 have a very good electronic file system of our  
25 licensing basis for the facility, and we are able to

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1 do keyword searches and identify any analysis that  
2 mattered for licensing that depended on time.

3 We also went through relevant calculations  
4 and looked for anything that was dependent on time,  
5 and we also interviewed our engineers.

6 We also compared ourselves against similar  
7 plants to see what was in their time-limited aging  
8 analysis population. So we think we have a good list  
9 of those calculations where time matters in terms of  
10 40 years.

11 One of the things we did need to relook at  
12 was the effects of increasing fluence on reactor  
13 vessel. Obviously fluence changes as you go to 60  
14 years, so we did re-perform our analysis for that.  
15 Analysis performed for 52.1 effective full power years  
16 was based on actual historical operation through Cycle  
17 #27, and operation beyond Cycle #27 to 60 years at  
18 95.6 percent capacity factor, that was based on 18  
19 months full power operating cycle, and 25 day  
20 refueling outage, which are very conservative.

21 The formal cycle projections, we did  
22 update those for 60-year life. We used where we were  
23 at the time we prepared the application in terms of  
24 actual events we have experienced to that point, which  
25 was 32 years of plant operation, then we

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1 conservatively projected forward to 60 years by  
2 doubling the current numbers.

3 Projections for 60 years fell within the  
4 assumed number of transients in the plant's design  
5 basis. And regardless of the number selected for the  
6 projection we will continue to monitor those on an  
7 ongoing basis, and if we approach one of those  
8 assumptions in terms of thermal cycles, we will take  
9 action before getting there and not waiting after the  
10 fact.

11 Now the environmental qualifications have  
12 all been updated for 60 years without any issues, as  
13 well as the miscellaneous remaining TOAs listed on  
14 this slide.

15 MEMBER STETKAR: Paul on the environmental  
16 qualifications, I noticed that there was response to a  
17 staff RAI regarding monitoring of ambient temperatures  
18 that are used for equipment qualifications and updated  
19 qualifications, and that the - apparently the last  
20 time you actually made any temperature measurements in  
21 any areas were 1991 - 92. So they are sort of 20  
22 years old now. And it was noted that you don't have  
23 any ongoing local area ambient temperature monitoring,  
24 but you have made adjustments based on what you think  
25 might be happening in the plant.

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1 I was also noted that you had a  
2 substantial backlog of what was characterized as  
3 unfinished EQ documentation updates. Tell me what you  
4 are doing in the environmental qualification area, and  
5 how do I have confidence that the actual in situ  
6 temperatures for these components that you are using  
7 for your EQ process are what's actually in the plant?

8 MR. HOTCHKISS: I am Mark Hotchkiss with  
9 Dominion. And you are correct, the ambient  
10 temperature monitoring is historical, and that is used  
11 as the input for the qualification bases. We as you  
12 mentioned we have conservatively increased ambient  
13 temperatures for different changes in the plant, for  
14 instance power uprate.

15 MEMBER STETKAR: How do you know they are  
16 conservative if you haven't measured them?

17 MR. HOTCHKISS: We didn't actually go out  
18 and confirm. However we don't expect - for instance  
19 for power uprate, we wouldn't expect any real ambient  
20 temperature change. However we applied one or two  
21 degrees of increase, so we consider that conservative.

22 But you are correct, we didn't go measure, but we  
23 really didn't see a need.

24 Now to respond to whether or not our  
25 historical temperature modeling remains valid, we do

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1 continually assess whether we need to reinitiate a  
2 program of ambient temperature modeling based on  
3 changes in the plant. And at this point we haven't  
4 felt the need. So that hasn't been done.

5 MEMBER STETKAR: You do that based on  
6 what, equipment modifications, changes to - supposed  
7 you backed - Dr. Shack mentioned, and I didn't look at  
8 the PRA, Bill, I'm sorry, thanks.

9 MEMBER SHACK: You would have found it  
10 interesting.

11 MEMBER STETKAR: I probably would, but  
12 there are other interesting things. You made  
13 modifications for example to reduce internal flooding.  
14 Has that involved installations of barriers that can  
15 affect airflows from location to location, ventilation  
16 mixing and therefore temperatures in the rooms?

17 MR. YUEN: No, the modifications that have  
18 been put in for flooding would not do that.

19 MEMBER SHACK: Okay, thanks.

20 MEMBER STETKAR: What about this back -  
21 where are you on getting caught up on your EQ  
22 documentation?

23 MR. HOTCHKISS: There was an EQ recovery  
24 effort --

25 MR. YUEN: The EQ recovery effort was

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1 completed in January.

2 MR. AITKEN: Okay, it has been. Next  
3 slide.

4 MEMBER SHACK: You have the CFA  
5 centrifugally cast piping and elbows, and I saw two  
6 analyses. One you did the lead before break, again  
7 assuming that you've got a full and embrittled  
8 material which is a conservative and reasonable  
9 assumption.

10 Another one you did was a flaw tolerance  
11 analysis, and you came up with a I think six-inch 28  
12 percent fuel wall crack. I just wondered what was the  
13 acceptance criteria for that. I am not familiar with  
14 the state of inspections of cast stainless steel. Can  
15 you see a crack like that, do you do a performance  
16 demonstration that gives you a degree of confidence  
17 you can detect a crack like that?

18 MR. HOTCHKISS: This is Mark Hotchkiss  
19 again from Dominion. And specifically for the flaw  
20 tolerance evaluation, the thermal embrittlement of  
21 cast iron and stainless steel evaluation, we chose the  
22 minimum detectible flaw by Section 11 as a starting  
23 point, and then the flaw tolerance grew the flaw based  
24 on the --

25 MEMBER SHACK: Okay, so that is the

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1 minimum detectible flaw that you started with?

2 MR. HOTCHKISS: Right, grew it over a  
3 period of time and showed that - the analysis showed  
4 that it would not grow to a critical side throughout  
5 the life of the plant.

6 MR. AITKEN: Any other questions there?

7 Ultimately our whole point here of course  
8 is to get the aging management programs that provide  
9 reasonable assurance that aging will be managed in the  
10 renewed term. We ended up with a total of 34 aging  
11 management programs; 28 of those are existing programs  
12 that we will just keep on doing. Six of those  
13 programs are new and one of them is plant specific as  
14 we have noted on that slide there. That program is  
15 our alloy 600 program.

16 Overall we had a good degree of  
17 consistency again with the GALL as we compared it with  
18 our AMPs.

19 This slide presents a high level summary  
20 of the number of amendments that are currently in  
21 place. Our original license renewal application  
22 submittal identified 28 commitments in appendix A of  
23 the application. Nineteen additional commitments were  
24 added during the resolution for the request of  
25 additional information. Two commitments were actually

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1 deleted based on the responses that were provided  
2 related to the original version of the work control  
3 process program that Brian mentioned, which I will get  
4 into a little more detail later.

5 So our license renewal commitments have  
6 already been entered into our site license commitment  
7 track system, just like any other NRC commitment. We  
8 are relatively close to the end of the current  
9 license, so we are moving straight into implementation  
10 activities. We are not waiting. So our goal is to be  
11 ready well in advance of the period of extended  
12 operation. We have a site license renewal  
13 implementation coordinator, along with a dedicated  
14 core team. We will support the ongoing implementation  
15 activities through coordination with the site program  
16 owners as well as working within the Dominion fleet.

17 As previously mentioned Dominion has four  
18 plant locations. One is the last in the fleet to  
19 pursue a renewed operating license. Four sites are in  
20 different stages of license renewal implementation  
21 activities. Surry is first in the queue, and they are  
22 currently working towards the completion of their  
23 implementation activities. As a matter of fact they  
24 have an industry assessment going on this week. We  
25 are engaged in these activities at Surry and Dominion

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1 is leveraging the fleet to ensure Surry is successful  
2 in using those lessons learned as we work our way  
3 through the Kewaunee. In addition we have always been  
4 learning from those ahead of us in the process, and we  
5 have taken the opportunity to benchmark our peers as a  
6 means to improve our current understanding of what is  
7 required for successful implementation.

8 So are there any questions before I move  
9 on to the next topic?

10 CHAIRMAN BONACA: When I look at your  
11 programs, at Appendix B, there is quite a discussion  
12 on operating experience, but it seems to be focused  
13 all on the Kewaunee operating experience. I think the  
14 NSC has raised the same issue. Have you looked at the  
15 sister plants, industry operating experience that may  
16 be applicable to Kewaunee, to what extent have you  
17 done that? I mean the programs don't describe that.

18 MR. AITKEN: Well, just as part of our  
19 process, our internal operating experience review, we  
20 do receive external operating events not only from our  
21 fleet as well as from the industry. They come in, go  
22 into our corrective action process where they are  
23 reviewed, screened, filtered, assigned and  
24 dispositioned. So that would be in the dataset that  
25 we would have available to us when we go and do our

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1 operating experience reviews. So the information is  
2 reviewed. It is available at the start of our  
3 internal corrective action program.

4 CHAIRMAN BONACA: Was it used?

5 MR. AITKEN: Oh, absolutely. It's used  
6 everyday.

7 CHAIRMAN BONACA: You may have an event  
8 only that leads you to believe that one-time  
9 inspection is adequate to confirm that in fact you  
10 don't have a problem, and if you look at the industry  
11 experience on the same issue you may have many  
12 examples and say that you should have a problem rather  
13 than a one-time inspection. So that's really a  
14 concern I would have is you would not be very focused  
15 only on this plant.

16 MR. AITKEN: We are focused on our plant,  
17 but we also have a mechanism for reviewing external  
18 information. We also are involved in industry groups,  
19 whether it's within license renewal as well as other  
20 technical groups, so there is a lot of information  
21 exchange that comes back into the fleet and it is  
22 discussed and disseminated between our respective  
23 working groups.

24 MEMBER STETKAR: Okay.

25 MEMBER STETKAR: Excuse me. I have one

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1 off the wall curious question. I didn't do enough  
2 homework to maybe answer it otherwise. In one section  
3 there is a discussion of the bleed steam system and  
4 whether it was in scope for A2. It was mentioned that  
5 it includes non-safety related components in spatial  
6 orientation near a safety-related system located in  
7 the turbine building. What safety related equipment  
8 do you have in the turbine building at Kewaunee?

9 MR. AITKEN: We have very limited safety  
10 related equipment in the building. We had a steam  
11 line for the turbine driven aux feedwater pump that  
12 runs down the wall of the turbine building that we  
13 considered as safety related. And is there anything  
14 else, Ben, that you can think of?

15 MR. RODILL: Yes, Ben Rodill, Dominion.  
16 There is the turbine first stage turbine pressure,  
17 QA1, safety related for the plant. So anything near  
18 that we had to include in the scope for spatial  
19 considerations.

20 MEMBER STETKAR: And that is it as far as  
21 safety?

22 MR. RODILL: Yes.

23 MEMBER STETKAR: Okay, thanks. It is just  
24 unusual, but I am familiar with some older plants that  
25 do have things in the turbine building, so thanks.

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1 MR. AITKEN: Fair enough.

2 So I'll transition at this time to two  
3 technical items of interest that we wanted to talk to  
4 the subcommittee about. One is groundwater quality,  
5 and we do have some slightly elevated boron levels in  
6 our groundwater, so we will discuss that. And  
7 secondly I'll present a histogram of reactor trip  
8 experience at Kewaunee. I think that that is  
9 something that this group is likely to review in the  
10 past.

11 So for groundwater quality, as you know  
12 the GALL has parameters that need to be monitored  
13 during the peak period of extended operation to  
14 minimize the potential impact on buried concrete. The  
15 parameters that are monitored include sulfates which  
16 has a value of less than 1,500 ppm, the pH values  
17 greater than 5.5, and chlorides less than 500 ppm.

18 Site groundwater readings during original  
19 plant construction and more recently during  
20 installation indicated that the groundwater levels for  
21 pH, chlorides and sulfates were well within the limits  
22 established by the GALL.

23 Here is a picture to try to get you  
24 oriented on the site here. So this is a very  
25 simplistic view. At the top we have our well

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1 locations. You can see next to the aux building  
2 that's the north side of the aux building. We have  
3 our reactor building, shield building down there, and  
4 there is a well building, 715.

5 MEMBER STETKAR: Can you give us - is  
6 there a gradient on the site or is this all pretty  
7 level?

8 MR. AITKEN: That is down the centerline  
9 of the plant.

10 MEMBER STETKAR: Yes, but I'm talking  
11 about grades, slopes. Which way does water flow?

12 MR. SORRELL: Generally the gradient of  
13 the groundwater across the site is about 10 feet to  
14 the west and then the gradient slopes toward the lake  
15 which is to the east of the right-hand side, and it's  
16 about 25 feet as it goes across the site there, it can  
17 be 25 feet. Charley Sorrell.

18 MEMBER STETKAR: So generally west to east  
19 which would be left to right on this building?

20 MR. SORRELL: That's correct.

21 MEMBER STETKAR: Okay.

22 MR. AITKEN: So in 2007 14 wells were  
23 installed as part of the groundwater monitoring  
24 initiative, and that's what we're looking at here.  
25 And eight of the wells are located near safety-related

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1 structures. We now use these wells as a means to  
2 collect data for monitoring groundwater based on their  
3 relative location of the wells to the structures. And  
4 their location is about 18 to 15 feet from the walls  
5 of the structure.

6 MEMBER STETKAR: You had no prior  
7 monitoring before 2007?

8 MR. AITKEN: We did when we were doing the  
9 IFSIS installation. We had a couple of monitoring  
10 locations out there, and I think we --

11 MR. SORRELL: We had one or two prior  
12 meetings during early - during construction. And then  
13 when we built the IFSIS facility, building those  
14 construction wells, we monitored what they were to  
15 give us a general idea. But generally we did not have  
16 groundwater monitoring on the site.

17 MEMBER STETKAR: No regular monitoring.

18 MR. SORRELL: No regular monitoring.

19 MR. AITKEN: So we tried to get what we  
20 could, because we started the project then the  
21 groundwater initiative project came along, and so we  
22 piggybacked off that.

23 So based on approximately three years of  
24 quarterly readings pH and sulfates are well within the  
25 established limits for a nonaggressive environment.

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1 However in three of the eight wells the average  
2 chloride levels, and I say average chloride levels,  
3 exceed the conservative limit of 500 ppm.

4 CONSULTANT BARTON: So this is even after  
5 you stopped using salt and put down the PVC, you were  
6 still getting elevated --

7 MR. AITKEN: Yes.

8 CONSULTANT BARTON: Okay.

9 MR. AITKEN: So just to give you a point  
10 of reference, the average of those three wells are 597  
11 parts per million for well 7-10; 554 parts per million  
12 for well 7-11 right next to it, and 628 parts per  
13 million for 7-15, which is this south side of the  
14 reactor building. So as you noted two of the wells  
15 are along the north wall of the aux building, and the  
16 third is on the south side of the shield building.

17 So we had felt this contributed to the  
18 elevated chloride, is a sodium chloride product that  
19 was used during the winter months. This product was  
20 introduced in the `90s and was used up until just a  
21 couple of years ago when we first discovered these  
22 higher levels.

23 We feel using this product on the paved  
24 areas in the other structure may have contributed to  
25 the slightly elevated chlorine levels in these three

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1 wells. But obviously there was a lot of snowfall out  
2 there in these locations, actually, where we pile and  
3 accumulate snow. So all the other wells remained  
4 below the 500 ppm. So as a result the station has  
5 switched to a 50-50 sand mix which is spread at a  
6 considerably lower rate than the sodium chloride, and  
7 we have a higher contribution of sand.

8 CONSULTANT BARTON: It's sand and what?

9 MR. AITKEN: It's a sodium chloride  
10 product. I don't know if we have a trademark name.

11 CONSULTANT BARTON: And before you were  
12 using an all-sodium chloride?

13 MR. AITKEN: All sodium chloride. So  
14 we've lessened the concentration of sodium chloride.

15 CHAIRMAN BONACA: The three wells that you  
16 mentioned was the 7-11 --

17 MR. AITKEN: 7-11, 7-10 --

18 CHAIRMAN BONACA: 7 -10.

19 MR. AITKEN: So we are going back off this  
20 and get you back onto the presentation if that is  
21 okay.

22 So we don't feel there has been an adverse  
23 effect on the adjacent concrete, because there is a  
24 polyvinyl chloride waterproof membrane that is located  
25 on the underside of the base mat that extends upward

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1 to one foot below grade of the exterior walls. This  
2 waterproof membrane was installed during construction  
3 to prevent infiltration of groundwater into the  
4 concrete structures.

5 Secondly the groundwater elevation in  
6 these areas is approximately 17 feet below grade. And  
7 only lower portions of the concrete walls and  
8 foundations are exposed to the groundwater.

9 Also the concrete is dense high quality  
10 concrete with low permeability and adequate cover. So  
11 by way of operating experience Kewaunee has only had  
12 minor in-leakage during the 36 years of operation.

13 So we believe for these reasons the  
14 concrete is not degraded due to the exposure of a  
15 slightly elevated chlorides in the groundwater.  
16 However Dominion is committed and will provide further  
17 assurance by taking a core sample in the aux building  
18 wall, below the groundwater elevation. This activity  
19 will test the chloride content in the concrete to  
20 validate that it is below the level to require it to  
21 cause degradation to the reinforcing steel in the  
22 concrete.

23 CONSULTANT BARTON: During that sample  
24 aren't you going to destroy the membrane, or did I  
25 miss where you're going to take the sample?

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1 MR. AITKEN: We are going to go from the  
2 inside up, and we are going to go approximately - is  
3 it 18 inches, Charley?

4 MR. SORRELL: Yes, Charley Sorrell with  
5 Dominion, it's 18 inches.

6 MEMBER STETKAR: What is the thickness of  
7 the wall?

8 MR. SORRELL: Thirty inches.

9 MEMBER STETKAR: Why not like 26 inches to  
10 see if you can get a gradient for example in chloride  
11 concentration?

12 MR. AITKEN: And that is what we are  
13 intending to do is take that core and section it out  
14 and see if we do get that grading, as we get closer  
15 into the structure.

16 MEMBER STETKAR: If you don't find it  
17 there what does it tell you about the other 12 inches?

18 CONSULTANT BARTON: Nothing.

19 MEMBER STETKAR: I think I would go look  
20 for it close to the exterior surface of the wall.

21 MR. AITKEN: We'll take that as feedback,  
22 thank you.

23 MEMBER ARMIJO: Is there any information  
24 that you have from other clients or your own client  
25 regarding - confirming that the water proofing

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1 membrane is still intact, not flawed, or torn. It's  
2 buried. So has there been any excavation for other  
3 reasons where somebody might have taken a look at that  
4 membrane?

5 MR. SORRELL: Yes, fortunately or  
6 unfortunately, Charley Sorrell with Dominion, there  
7 was an excavation performed on the west wall of the  
8 auxiliary building to bring in a dump bank and went up  
9 the wall and was going to core through the concrete  
10 above grade. And we were able to excavate about four  
11 or five feet of the top portion of that membrane. It  
12 was inspected, in very good condition, and no obvious  
13 degradation of that membrane.

14 MR. AITKEN: Dominion has scheduled to  
15 have the core removed and tested this year, so we are  
16 moving aggressively on this one. We are not waiting.  
17 Actually we are going to have the core taking next  
18 week. So we are moving on it.

19 (Simultaneous conversation)

20 CONSULTANT BARTON: Drill deeper.

21 MR. AITKEN: We will certainly take your  
22 feedback. Better than saying it was last week, I  
23 guess.

24 MEMBER STETKAR: This is not a  
25 hypothetical, we'll take it back and consider it for a

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1 few months.

2 MR. AITKEN: Just to follow up on these  
3 issues, Dominion will continue to monitor the  
4 groundwater and the chloride levels do not decrease  
5 below 500 parts per million within the first 10 years  
6 of the period of extended operation, and we already  
7 made a commitment to do another chlorine.

8 MEMBER ARMIJO: Just to make sure that you  
9 know the root cause of this high chloride, in the  
10 other wells in the vicinity of the plant for whatever  
11 purposes, are these high chloride levels or relatively  
12 high chloride levels common or is the chloride level  
13 typically very low?

14 MR. AITKEN: Well, they are certainly  
15 below the 500 ppm. Charley has the numbers over  
16 there.

17 MEMBER ARMIJO: You know like city wells  
18 or private wells, what do they read?

19 MR. SORRELL: There are a total of 14  
20 wells that were installed for the groundwater review,  
21 and there are eight wells that go through the plant as  
22 well as other wells around the facility. The wells  
23 that are in the grassed areas and not near the paved  
24 areas where there is salting are still relatively  
25 below the 500 limit considerably. The wells where you

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1 have like a parking area and you get the salt piled up  
2 and the snow piled up have experienced higher  
3 readings.

4 MEMBER ARMIJO: So in these grassy areas,  
5 what is the number, a couple of hundred or 400 or  
6 what?

7 MR. SORRELL: We have readings that ranged  
8 at well 701 for example, less than 100, 702 less than  
9 100, 705 is less than 300.

10 MR. AITKEN: But relatively low.

11 MEMBER ARMIJO: So you do pretty much have  
12 a good idea where the high salt concentration comes  
13 from?

14 MR. AITKEN: Currently we are doing this  
15 every quarter. We are trying to stay on top of it.

16 MEMBER ARMIJO: I'm from Nevada, the dry  
17 part of Nevada, we don't use too much salt down there.

18 But that part of Nevada gets about two inches of rain  
19 per year. So I don't know much about desalting stuff.

20 But is there anything better than chloride? Is there  
21 anything else you can use?

22 CONSULTANT BARTON: Sand.

23 MEMBER ARMIJO: Sand or ash or something  
24 like that?

25 MR. AITKEN: The station has evaluated

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1 different applications of different materials with  
2 varying levels of success. So it's something we are  
3 still evaluating. It's a product that we tried a  
4 couple of winters ago with mixed reviews, so we are  
5 still pursuing it.

6 MEMBER SHACK: In Chicago we use beet  
7 juice mixtures now.

8 MEMBER STETKAR: A lot of buried cables,  
9 it works okay.

10 MR. AITKEN: Thank you for the question.

11 So that was the end of my discussion on  
12 the groundwater quality issue. Go to the next slide.

13 So I have a slide as I mentioned on the  
14 histogram of reactor trips at the Kewaunee station.  
15 As you would expect the frequency of trips has slowed  
16 through the years of operation. We have recorded our  
17 plant trips since the beginning of plant operation,  
18 and just to let you know we do monitor plant trips as  
19 a transient fatigue cycle kind of purposes.

20 Here is our chart. Typically you like to  
21 look for a knee, and the knee appears to be around  
22 1980, '81. And as Steve alluded to earlier our last  
23 three years have been solid operating cycles for us.

24 (Simultaneous conversation)

25 MR. WILSON: During that period of time we

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1 had a number of trips that were based on equipment  
2 reliability issues that had not been previously  
3 corrected including associated with a heat pump motor  
4 short, some what we called blind relays, relays that  
5 were undetectable but had failed so when we tested  
6 them on our nuclear instruments it caused a reactor  
7 trip, and also a breaker failure. And we have  
8 addressed those equipment reliability issues.

9 MEMBER STETKAR: What you have done though  
10 for projecting the number of cycles - correct me if  
11 I'm wrong - is you've taken the total number of  
12 accumulated cycles since day one and doubled it; is  
13 that right?

14 MR. AITKEN: Since the 2006?

15 MEMBER STETKAR: Up to 2006, whenever the  
16 line was drawn. And that's total since day one. You  
17 didn't do any screening to throw out any early  
18 operations or anything.

19 MR. AITKEN: We took a very conservative  
20 approach.

21 MEMBER STETKAR: Well, it's an approach.  
22 Other than the first three or four years where you  
23 might have a few extra, it looks like your trip rate  
24 has been relatively constant over about you know 25  
25 years at least, or 27 years. And given recent - okay

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1 the last three years it's been pretty small, but over  
2 the past five or six years there have been some  
3 wiggles and variations. So it's probably not  
4 unreasonable to double it. It might be a little bit  
5 conservative, but it's certainly not a factor of two  
6 or three conservative to do that given your relatively  
7 flat operating experience.

8 MR. AITKEN: Okay, if there is nothing  
9 else on this we will move on.

10 As I mentioned earlier we have four open  
11 items to discuss with the subcommittee that are  
12 currently reflected in the draft SER. What I will do  
13 is I will discuss the staff concern and then provide a  
14 summary of our response to this issue.

15 MEMBER STETKAR: I did have a question on  
16 the last one, shuffling notes here. In the safety  
17 evaluation report, I don't remember whether it was the  
18 audit report, one of the reports that I read, said  
19 that there were additional transients listed in the  
20 station records beyond those for which you do your  
21 formal counting. In other words there are certain  
22 categories that you count, and you throw one into one  
23 bin when it happens. What are those other transients?

24 And how many of them? Can you give me examples of  
25 what they might be and how many of them you've

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1 experienced and why they are not relevant?

2 MR. HOTCHKISS: Mark Hotchkiss for the  
3 applicant.

4 Yes, what that was referring to was  
5 transients that we track that were beyond the  
6 transients assumed in the Class I fatigue analysis.  
7 And some examples of those would be charging and let  
8 down transients. Kewaunee's vintage above the RCS is  
9 not Class I piping, it's B31-1, it's not ASME III. So  
10 there was no fatigue analysis. So the charging and  
11 let-down transients were not tracked for Class I  
12 purposes. So that is a charging let down.

13 Auxiliary heat exchangers such as RHR heat  
14 exchangers, excess let down, transients for those  
15 components; those are things we are looking at for 40  
16 - 60 years as a TOL.

17 MEMBER STETKAR: Have you done your  
18 fatigue analyses on those systems? In particular  
19 charging and let down, because they can occasionally  
20 be subjected to some pretty severe temperature swings  
21 depending on what particular transient is. Isolate  
22 let down for example.

23 MR. HOTCHKISS: Yes, for the most part -  
24 for those non - for Kewaunee's basis, non Class I  
25 components we did not do fatigue analyses. We looked

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1 at P-31-1 basis for limiting our thermal cycles. For  
2 charging in particular though, that was a location we  
3 had to actually apply environmental effects factors,  
4 so we did do a fatigue analysis for the charging loop  
5 nozzle.

6 MEMBER STETKAR: What is your projected  
7 60-year CUF for that nozzle?

8 MR. HOTCHKISS: I have it here. The  
9 charging nozzle without considerations for  
10 environmental effects was point zero three. And with  
11 consideration of environmental effects was point four  
12 six.

13 MEMBER STETKAR: So you got a pretty good  
14 margin. There was certainly nothing that I read in  
15 the report that was close. Did you - any of your  
16 analyses for locations that are not specifically  
17 listed in the amendment show environmentally adjusted  
18 usage factors up in the point nine area or  
19 thereabouts, or projected greater than one?

20 MR. HOTCHKISS: When you say not included  
21 in the amendments, we had six locations we evaluated  
22 for environmental.

23 MEMBER STETKAR: And they are all --

24 MR. HOTCHKISS: They are all in the LRA.  
25 And they are all below one. And there are none that I

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1 --

2 MEMBER STETKAR: For example the charging  
3 nozzle is not included in the amendment but you've  
4 done an analysis on it.

5 MR. HOTCHKISS: No, it is included. There  
6 is one of our locations, that was one.

7 MEMBER STETKAR: Okay.

8 MR. HOTCHKISS: A couple of locations on  
9 the reactor vessel.

10 MEMBER STETKAR: I thought I remembered  
11 reading something about an auxiliary heat exchanger or  
12 something that had design cycles for the reactor  
13 coolant hot leg sample heat exchanger would be  
14 exceeded prior to the period of extended operation.

15 MR. HOTCHKISS: For that particular item  
16 we did not perform a fatigue analysis for that  
17 component. We were conservatively considering that a  
18 TLA because the original design specification talked  
19 about 36,000 cycles for a 50-year life of that  
20 component. Here we are going to 60 years. We  
21 evaluated that as TLA, and we are just looking at  
22 cycles for that. We didn't do a fatigue analysis.

23 MEMBER STETKAR: Okay. Okay, thanks.

24 CHAIRMAN BONACA: So you are going to walk  
25 us through the open items?

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1 MR. AITKEN: Yes, I am, sir.

2 So we go to the next slide. So the first  
3 item relates to the FatiguePro software. There is our  
4 submittal, with stress-based fatigue numbers for two  
5 of the NUREG 6260 environmentally assisted fatigue  
6 locations. The charging line nozzle and the  
7 pressurized surge line hot leg nozzle. Following the  
8 submittal of the Kewaunee application in August of  
9 2008, regulatory information summary 2008-30 was  
10 issued in December. It was issued by the staff with  
11 concerns for nonconservatism with the FatiguePro  
12 stress statistics fatigue approach. Subsequently the  
13 staff issued Kewaunee an RAI requesting that we make  
14 an appropriate adjustment and corrections regarding  
15 the use of the stress based monitoring and reevaluate  
16 the cumulative use factor. In accordance with the  
17 guidelines described in ASME Section 3-NB-3200.

18 We made a commitment to perform the  
19 reanalysis in our original RAI response, but we can  
20 report in the ASME Section 3 analysis for these two  
21 locations have subsequently been completed, and the  
22 results are acceptable for 60 years. The  
23 environmentally assisted fatigue evaluations were also  
24 determined to be acceptable for 60 years as Mark just  
25 mentioned.

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1 MEMBER ARMIJO: What were the numbers?  
2 What were the usage factors for those two components?

3 MR. AITKEN: As Mark mentioned the first  
4 one on the charging nozzles of the CUF was .03. And  
5 the environmental number was .46 - I'm sorry, .75 -  
6 I'm sorry, .46 for the charging nozzle, and then for  
7 the surge nozzle CUF was .09, and the environmentally  
8 assisted fatigue number for 60 years was .75.

9 So we provided that information to the  
10 staff on June 1<sup>st</sup>, 2010, and it's currently under staff  
11 review.

12 That's all I have on that if there are any  
13 other questions?

14 The next topic is the work control process  
15 program. I need to provide you a little background on  
16 this topic as Brian alluded to in his opening remarks  
17 to set the stage for this open item so you have the  
18 benefit of understanding a significant change that  
19 occurred which impacted the overall review schedule  
20 for Kewaunee.

21 The Kewaunee work control process program  
22 that was originally submitted in the license renewal  
23 application was developed to model the fleet approach  
24 within Dominion. Based on the previous acceptance of  
25 this aging management program for Surry, units #1 and

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1 #2, North Anna units #1 and #2, and Millstone's units  
2 #2 and #3. Following the sufficiency review, and  
3 during the course of the staff's technical review,  
4 several concerns began to surface for the submitted  
5 plant-specific aging management program.

6 So as a result in July 2009 a public  
7 meeting was held between Dominion and the NRC to  
8 brief the staff reviewers and NRC management on a  
9 change of direction. At that time we informed the  
10 staff that we intended to supplement the license  
11 renewal application to align with the GALL using the  
12 one-time inspection aging management program, which is  
13 referred to as M-32, and the inspections of internal  
14 surfaces aging management program, which is referred  
15 to as M-38 in the GALL, in lieu of the aforementioned  
16 work control process program.

17 We did indicate to the staff during that  
18 meeting that these two GALL programs would be bundled  
19 under one aging management program, maintaining the  
20 title of work control process. And that was to  
21 minimize several perturbations in the application.

22 We subsequently provided a supplemental  
23 response to the staff in September, 2009, reflecting  
24 the revised work control process, which now addressed  
25 the elements of those two GALL programs. We also

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1 reclassified this work control program as a new  
2 program in lieu of a plant-specific program.

3 That's a little bit of background so you  
4 have the benefit of that.

5 CONSULTANT BARTON: So now you are doing  
6 these inspections for your work control program. What  
7 controls have you got on that program that somebody  
8 can't change a procedure on an item that is a one-time  
9 inspection requirement? How do you control on that?  
10 Because now you are going through your work process,  
11 and you can change those procedures. How do you  
12 control that?

13 MR. AITKEN: Well, it's essentially the  
14 two GALL programs. We are consistently with the GALL  
15 programs. We are just using the title of work control  
16 process programs, but that title was used throughout  
17 the application, and many times it really didn't  
18 change the intent of what - the change we were  
19 proposing didn't change the intent of a lot of the  
20 information in the application, so we are using those  
21 two programs. It's just that they are both bundled  
22 under the title of work controls. The controls,  
23 inspections, qualifications, are what they are as  
24 reflected in the GALL document.

25 CONSULTANT BARTON: Okay.

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1                   MEMBER ARMIJO:       Are there any good  
2 features from your original work control process  
3 program that have been lost by virtue of converting to  
4 just using what the NRC told you to use?

5                   MR. AITKEN:       (Laughter)   We feel there  
6 are, and we explained that to the staff in the public  
7 meeting. We discussed it. We understood the staff's  
8 concerns. But not all is lost.

9                   MEMBER ARMIJO:   Well, you know, what I'm  
10 getting at, you had this other process in place for  
11 many years. Your staff is used to it; you guys are  
12 used to it. It must have had some good features, and  
13 I just want to be sure that in converting to this  
14 other approach you don't lose some of those.

15                  MR. AITKEN:   Right, well, you know, one of  
16 the big things that we thought was a benefit of our  
17 version of the work control program was the frequency  
18 of inspections that we would continue to do during the  
19 period of extended operations, where one-time  
20 inspections would lead you to do one-time inspections,  
21 kind of a once and done approach, where we were going  
22 to continue to do it, not that we are not going to do  
23 that at the site, but under the auspices of license  
24 renewal. So that was one of the big things that we  
25 thought this program brought to the table.

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1           We haven't deleted our work management  
2 program that we are going to use. So we will still  
3 use that. We will still get the benefit from that.  
4 What this does is overlay this additional process on  
5 that.

6           MEMBER SHACK: Okay.

7           MR. AITKEN: We are just trying to take  
8 maintenance that we do in the field, everyday, all the  
9 internal inspections that we do. We will train our  
10 maintenance staff to learn to identify aging effects,  
11 and then document on inspection sheets.

12           Now with that background, let's discuss a  
13 couple of remaining questions that the staff had in  
14 developing a draft SER. First the staff requested  
15 some additional information related to our intended  
16 sample methodology for the one-time inspection program  
17 portion of the work control program.

18           Next the staff requested some additional  
19 information related to the minimum sample size for the  
20 periodic inspections, and the inspection frequencies  
21 for the inspection of internal surfaces program  
22 portion of the working control program. So we had the  
23 M32 and the M38 portions of work control that we are  
24 talking about.

25           The work control process program is a new

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1 aging management program. But in our last response to  
2 a request for additional information we provided a  
3 couple of examples how we were able to get back to  
4 aging through our maintenance activities, and how that  
5 information was identified and included in our  
6 corrective action program.

7 The staff requested additional  
8 verifications on this operating experience, and it was  
9 intended to be reflective of the new program.

10 And lastly the staff wanted clarification  
11 that the work control process program required  
12 enhancement, first to be implemented as a new program  
13 for Kewaunee.

14 CHAIRMAN BONACA: I didn't quite  
15 understand that. Go to bullet #2. Sample size for  
16 periodic inspections and inspection frequencies for  
17 inspections of internal surface. In this case what is  
18 the difference between what you were doing before and  
19 what the NRC wants you to do?

20 MR. AITKEN: What we were doing before was  
21 an opportunistic inspection approach for work control.

22 And we went back through maintenance history over the  
23 last 10 years and looked at all our maintenance  
24 records to paint a picture of how often we have  
25 opportunities to go into the plant systems. And we

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1 sliced that data by system, by components and by  
2 material, by environment. And what we were able to  
3 demonstrate is, we are out in the plant, we are doing  
4 maintenance everyday, and over the course of 10 years  
5 we are touching just about everything. So for the  
6 second bullet it's similar in nature, but it all  
7 doesn't require specific sample-based information. So  
8 I think the staff was looking for some additional  
9 information to help him or her understand the scope of  
10 what needed to be done.

11 Does that answer your question?

12 CHAIRMAN BONACA: Yes.

13 MR. AITKEN: So going to slide #25 which  
14 will provide an overview of some of the information we  
15 have provided back to the NRC. So we provided some  
16 additional information to the staff that described our  
17 approach in developing a sample size for the various  
18 materials and the scope of the one-time inspection  
19 portion of the work control AMP. The sample  
20 methodology will take into consideration the various  
21 materials, environments, aging effects, as well as  
22 plant specific OE for these in-scope licensing  
23 equipment.

24 Sampling approach is justified since one-  
25 time inspections are to be performed for components

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1 that really are within the scope of the water  
2 chemistry programs. And the inspection results will  
3 provide additional assurances that unexpected aging is  
4 not occurring. So M32 is really just a validation of  
5 the effectiveness of our chemistry program.

6 For M38 we clarified that this aging  
7 management program is not based on a statistically  
8 determined sample size or a specified confidence level  
9 approach. As I described with M32, but more an  
10 opportunistic based inspection using the existing  
11 surveillance and maintenance activities implemented at  
12 the station.

13 So in response to this RAI we provided  
14 additional information to the staff that indicates  
15 that historically there have been sufficient internal  
16 surface inspection opportunities during surveillance  
17 and maintenance activities for the vast majority of  
18 the material and environment combinations. We have  
19 done an historical review over the last 10 years as I  
20 just described, and have a high degree of confidence  
21 that adequate inspection opportunities do exist.

22 In a situation where a material and  
23 environment combination has not been adequately  
24 inspected, then we will perform a deliberate  
25 inspection or inspections as required. Now as an

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1 example, the material group of non-metallics and well  
2 water environment currently don't have any routine  
3 maintenance performance, so if we don't have an  
4 opportunity to have an inspection done prior to the  
5 period of extended operation, we will go out and  
6 schedule and do a deliberate inspection.

7 CONSULTANT BARTON: On what?

8 MR. AITKEN: On non-metallics and well  
9 water. That is just an example. We have gone back  
10 and looked through the grid, and we just don't have  
11 enough data there from the last 10 years, so we will  
12 go out and do that, we will schedule that inspection.

13 CONSULTANT BARTON: How much other  
14 inspections on your service water and in circ water  
15 where you have had - have you had corrosion, erosion  
16 and growth in those systems? I wasn't clear in  
17 reading the material that you really had that under  
18 control, and you had a lot of problems with your  
19 chemical injection system, and zebra mussels starting  
20 getting - and are you ahead of the zebra mussels or  
21 are they ahead of you at this point?

22 MR. AITKEN: That is a good question.

23 MR. HANNA: Tim Hanna for the applicant.  
24 We have a program where every time a service water  
25 system component is opened we document a visual

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1 inspection of either the interior piping surface or  
2 the interior, the heat exchanger. We have seen  
3 microbiologically influenced corrosion in the service  
4 water system piping. We have not seen any corrosion  
5 in the service water system piping. We have done some  
6 routine readings to confirm in the high flow areas to  
7 confirm that we do not have erosion in the piping, and  
8 the MIC is generally confined to the leg sections and  
9 intermittent flow sections.

10 We have had erosion of copper heat  
11 exchanger tubing in the service water system, and we  
12 have instituted a replacement program for a safety-  
13 related units that have had problems with erosion in  
14 the past. And we have previously had problems with  
15 reliability of the chlorination system and that has  
16 been corrected through increased management attention.  
17 We developed performance indicators for the  
18 availability of the system, so now that is reported  
19 on, and the maintenance on the system gets a higher  
20 priority, and the reliability of the system has  
21 improved over the last several years.

22 CONSULTANT BARTON: So you are beating up  
23 on the zebra mussels, you are telling me?

24 MR. RUSCH: That is correct.

25 CONSULTANT BARTON: Okay, thank you.

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1 MR. AITKEN: Just to finish up this topic,  
2 for the third sub-bullet there, we established a new  
3 commitment to provide the staff with operating  
4 experience related to the effectiveness of the work  
5 control process program within two years into the  
6 period of extended operation since it is a new  
7 program.

8 And lastly we clarified with the staff  
9 that the work control process program will be  
10 implemented and inspections completed prior to the  
11 period of extended operations.

12 So in summary our response to this open  
13 item was provided to the staff on May 13<sup>th</sup>, 2010. It's  
14 currently under staff review.

15 MEMBER STETKAR: Paul, the commitment 47,  
16 I recognize the gamesmanship of calling something a  
17 new program and saying you don't have any operating  
18 experience for that new program since it's called a  
19 new program. But you told us you have been doing this  
20 stuff for something on the order of 40 years now. How  
21 have you factored in that operating experience from  
22 what you've been doing in terms of adjusting  
23 inspection intervals or even what you sample for this  
24 now new program that is perhaps somewhat more  
25 structured?

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1           In other words 40 years of operating  
2           experience from what you've been doing doesn't seem to  
3           be irrelevant simply because you've reclassified a  
4           program now as a new program.

5           MR. AITKEN: I mean I would say at a high  
6           level we do inspections, we find the results, we enter  
7           them into our corrective action systems, we do  
8           extended commission reviews, extent of cause. And if  
9           we need to broaden our review or inspections then we  
10          do so through that process.

11          MEMBER STETKAR: But for example I mean if  
12          you go back and look at the effectiveness of your  
13          inspections or the opportunistic checks or whatever  
14          you have been doing, that information can help you  
15          organize areas to focus on or experience in places  
16          that you haven't been working, and I'm curious to see  
17          how you have done that in kind of tailoring this new  
18          program.

19          MR. AITKEN: Well, it is a new program,  
20          and so that review looks at, and evaluation of the  
21          data is really a function of the license renewal  
22          coordinator as we move forward into the period of  
23          extended operations.

24          MEMBER STETKAR: Maybe I will ask the  
25          staff. Thanks.

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1 MR. SCACE: But I think what Paul  
2 indicated is, we are using that experience and  
3 demonstrating the opportunistic if you would views.  
4 And those are conditioned based on experience as you'd  
5 expect over 40 years. So some inspection frequencies  
6 we do more often, and will continue to do that. They  
7 will now be documented under this new program, but we  
8 are not going to start at ground zero because we have  
9 a new program. So a major part of this other than  
10 those we determine we haven't had sufficient  
11 opportunistic opportunities, that program and that  
12 experience will continue with our inspection.

13 MEMBER STETKAR: Okay, thanks, that helps  
14 a little bit, thanks.

15 MR. AITKEN: Next slide.

16 So the third open item relates to steam  
17 generator divider plate cracking. On this item the  
18 staff requested additional information from Kewaunee  
19 related to the materials of construction of the steam  
20 generator divider blade, and the weather cracks in the  
21 alloy 600 divider plate could propagate into the base  
22 material of the channel head or into the tube sheet  
23 platen.

24 If we determined that this condition was  
25 likely then the staff requested that the details of an

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1 inspection be provided for review. As Brian mentioned  
2 the request was based in part on I believe French OE  
3 with the divider plate cracking.

4 MEMBER STETKAR: Paul, before you go back  
5 to the other slide, the last bullet on there, it says  
6 recent - oh recent foreign operating experience. I'll  
7 ask you now before you get into the materials things  
8 that I don't understand anything about, you replaced  
9 the steam generators in 2001. In 2006 apparently you  
10 discovered a number of foreign objects in both your  
11 steam generators. All I know is what I read in the  
12 reports. Five foreign objects in steam generator A  
13 and nine foreign objects in steam generator B.

14 This has nothing to do with the topic of  
15 what you are talking about here as far as primary  
16 water stress corrosion cracking, but at least the  
17 steam generators - and I was going to ask you later  
18 anyway so I might as well do it now. What were they?

19 Where did they come from? And do you have a loose  
20 parts monitoring system?

21 MR. HANNA: Tim Hanna for the applicant.  
22 We do have a loose parts monitoring system. All of  
23 the parts that you are referring to were on the  
24 secondary side of the steam generators, and they were  
25 very small remnants for manufacturing such as weld VBs

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1 or very small machine turnings. And they were either  
2 removed from the steam generators or evaluated as  
3 acceptable for continued service, due to the very  
4 small volume of the material.

5 MEMBER STETKAR: So they were - you  
6 actually determined that they had been in there since  
7 the original installation?

8 MR. HANNA: That is correct.

9 MEMBER STETKAR: Okay.

10 CONSULTANT BARTON: Do they have a loose  
11 parts monitoring system?

12 MEMBER STETKAR: It's not really a part.  
13 Loose parts monitoring typically picks up more stuff  
14 on the primary site. It's pretty messy out on the  
15 secondary side.

16 MR. AITKEN: Okay, so this issue remains  
17 under review by the various experts and technical  
18 groups in the industry along with the NRC staff. A  
19 meeting was conducted just last week between the NRC  
20 and the industry where several people were trying to  
21 understand the concern and ascertain what is the best  
22 path to resolve this item not only for Kewaunee, but  
23 for the other affected plants in the United States.

24 Dominion remains active in these forums,  
25 and if there are any new requirements promulgated to

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1 the industry, then Dominion will evaluate the industry  
2 recommendation like the other affected plants and do  
3 the right thing.

4 In response to this open item we concluded  
5 that the condition described by the staff is unlikely  
6 for Kewaunee for the following reasons. First, the  
7 steam generators are relatively new, they're not quite  
8 10 years old as Stew had mentioned. They are not  
9 likely to experience cracking with this limited  
10 service life.

11 Next, although the divider plates are  
12 alloy 600, the divided plate assembly welds are made  
13 from alloy 52/152 weld metal which is inherently  
14 resistant to cracking caused by PWSCC.

15 Also we believe there is sufficient data  
16 from the industry resource to support the conclusion  
17 that PWSCC cracking stops when nonsusceptible  
18 materials are encountered.

19 There is no U.S. or international OEs that  
20 Dominion, EPRI or Westinghouse is aware of indicated  
21 that cracking of the divider plates has ever  
22 propagated into adjacent tube sheets of channel heads.

23 So based on the above Kewaunee concluded  
24 in its response to this open item that an inspection  
25 program is not warranted at this time. And that

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1 response has been provided to the staff as of July  
2 22<sup>nd</sup>, 2010, and is currently under review.

3 And our last open item, relates to the  
4 ongoing issue related to buried piping and underground  
5 components. First the staff requested that Kewaunee  
6 identify systems with components that are in a buried  
7 or an underground environment. The staff also  
8 requested that we provide any updates related to  
9 operating experience with the buried piping that was  
10 not included in our application submittal.

11 First I'd like to address the equipment  
12 located in an underground environment, which could be  
13 within vaults or chases, and exposed to air on the  
14 external surfaces. Kewaunee has very limited  
15 equipment in this category, just a few feet of fuel  
16 oil transfer piping for our diesel fuel oil system,  
17 and a couple of fuel oil transfer pumps. This  
18 equipment is managed for the effects of aging by the  
19 visual inspections performed in accordance with the  
20 external surfaces monitoring program on a period  
21 frequency.

22 The remaining components that are in a  
23 soil environment are managed for the effects of aging  
24 by the buried piping and tank inspection program which  
25 I will discuss here in the next few slides.

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1 MEMBER STETKAR: Paul, you talk about  
2 buried piping, the general stuff extends also to so-  
3 called underground piping. There are pipe chases,  
4 pipe ducts, things like that. What in scope piping is  
5 in that classification? Do you have any?

6 MR. AITKEN: Well, that is what I  
7 mentioned. We just have a few feet of fuel oil  
8 piping, and it's very limited in scope.

9 MEMBER STETKAR: Service water piping  
10 doesn't go through an underground - nothing? It's  
11 above ground?

12 MR. AITKEN: No, it's direct buried.

13 MEMBER STETKAR: Oh, direct buried.

14 MR. AITKEN: Next one we'll talk about  
15 that.

16 MEMBER STETKAR: Okay, thanks. I thought  
17 it was in a tunnel.

18 MR. AITKEN: All right, so here's a list  
19 of systems that fall in the category of being in a  
20 direct buried or soil environment. As you can see  
21 these systems are not radioactive fluid process  
22 systems. At Kewaunee all piping in tanks that do  
23 contain radioactive fluid are located in a Class I  
24 structure. It's one of the benefits of being in the  
25 Midwest.

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1 We have listed the systems and the number  
2 of inspections that we have committed to along with  
3 the frequency of the inspections on this slide. For  
4 your information each piping inspection will consist  
5 of a minimum of 10 linear feet. So I'll try to walk  
6 you through the information on the slides.

7 MEMBER STETKAR: I'm sorry, I'm still  
8 being dense. I don't see service water piping listed  
9 here anywhere.

10 MR. SCACE: Service water piping is in a -  
11 you could call it a tunnel but it's actually part of  
12 the structure. It's a walkway.

13 MEMBER STETKAR: It's all accessible,  
14 visually accessible?

15 MR. SCACE: Yes, absolutely.

16 MEMBER STETKAR: Thanks, that's what I  
17 thought I remembered. I wanted to make sure it was  
18 all visually accessible and that it didn't go through  
19 a section that got real small.

20 MR. SCACE: Not, it's all visually  
21 accessible.

22 MR. AITKEN: So we have approximately 200  
23 feet of coded and red carbon steel circ water piping  
24 as well as approximately 15 feet of coated and wrapped  
25 stainless steel circ water piping. We will perform

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1 one inspection of each of these material environment  
2 combinations prior to the period of extended  
3 operation, and then again in the first 10 years  
4 thereafter. So as total of two inspections prior to  
5 and then again two more inspections in the first 10  
6 years thereafter.

7 We have approximately 500 feet of diesel  
8 generator fuel oil piping that is coated in wrapped  
9 carbon steel. We will inspect this once prior to the  
10 period of extended operation, and then once again in  
11 the first 10 years thereafter.

12 We have three fuel oil storage tanks, two  
13 for the emergency diesel generators and one for the  
14 tech support center, it's a standby generator, and we  
15 have committed to inspect one of the three storage  
16 tanks prior to the period of extended operation, and  
17 then inspect another tank while in the first 10 years.

18 CONSULTANT BARTON: None of those fuel oil  
19 storage tanks have been inspected to date?

20 MR. AITKEN: Not externally but internally  
21 they have?

22 CONSULTANT BARTON: Internally? All  
23 right. Now you've got these things strapped with  
24 external straps that are uncoated. Have they ever  
25 been looked at?

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1 MR. AITKEN: No, but they will be as part  
2 of the tank inspections, as we remove the soil they'll  
3 be exposed.

4 CONSULTANT BARTON: You will look at the  
5 straps, the hold downs?

6 MR. AITKEN: That's correct.

7 Lastly we have approximately 2,350 feet of  
8 coated ductile iron for our fire protection system.  
9 We have committed to perform three inspections prior  
10 to the period of extended operations, and then three  
11 more inspections in the first 10 years thereafter.

12 We feel that this proposed inspection  
13 scope and frequency will provide reasonable assurance  
14 that the effects of aging will be adequately managed  
15 for the period of extended operation.

16 MEMBER STETKAR: You have to replace some  
17 potable water piping. Is the material in the potable  
18 water piping the same as your fire protection piping?

19 MR. AITKEN: Yes, it is. We did it as an  
20 extended condition on our potable water piping  
21 failure, we did an extended condition on our fire  
22 protection piping in 2007. We actually excavated.  
23 The results were acceptable. The pipe was in good  
24 condition. It's a pretty big trench we've got to dig  
25 to get down to it.

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1                   CONSULTANT BARTON:    This piping you are  
2 showing us is what now?

3                   MR. AITKEN:           That's fire protection  
4 piping.

5                   MEMBER ARMIJO:    That's ductile cast iron  
6 coated with some - wrapped and coated with some  
7 material?

8                   MR. AITKEN:    That is correct.

9                   MEMBER ARMIJO:    And how about the inside,  
10 what does it look like inside? Is it rusted?

11                  MR. RUSCH:    Jim Rusch for the applicant.  
12 That is a concrete lined pipe, so it would have a  
13 concrete liner inside. I don't believe that we have  
14 ever inspected the internals of that. They haven't  
15 sent a camera in.

16                  MEMBER ARMIJO:    Do you use any kind of  
17 galvanic protection like anodes for your tanks or  
18 piping systems?

19                  MR. AITKEN:    Yes, we do, the circ water  
20 system piping and all but about 100 feet of the diesel  
21 oil fuel oil piping is cathodically protected. The  
22 fire protection piping is not cathodically protected.

23                  MEMBER STETKAR:    So this was done in 2006,  
24 `7?

25                  MR. AITKEN:    2007.

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1                   CONSULTANT    BARTON:            This    picture  
2                   apparently is in the winter time.    What is all that  
3                   white stuff on the top of the picture?   Is that just  
4                   soil?   Or is that something on it, all that stuff?

5                   MR. RUSCH:    Jim Rusch for the applicant,  
6                   that would be the sand, the backfill, that was near  
7                   the piping.    You look at the backfill for small  
8                   uniform size backfill.    So they would have just piled  
9                   that off to the side.

10                  CONSULTANT    BARTON:        Okay, I was just  
11                  making sure it wasn't dried salt from the -  
12                  (laughter).   Thanks for clarifying that.

13                  MR. AITKEN:    Okay, that is all I have on  
14                  that slide.    If there are no other questions we'll  
15                  move on.

16                  CONSULTANT    BARTON:        I've got a couple of  
17                  questions.

18                  You committed to a non EQ inaccessible  
19                  medium voltage cables, to inspect manholes for water  
20                  collection every two years.    And I was wondering how  
21                  you came up with every two years.    On a lot of  
22                  applications I've seen after every rainfall season,  
23                  after snow melts or something, they go down and look  
24                  at manholes.    All I see is every two years.

25                  MR. AITKEN:    At least every two years,

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1 that's correct. Since 2006 we've been in five times,  
2 and the water level in there is an inch or two. As I  
3 mentioned earlier the groundwater level is 15 or 16  
4 feet below that manhole.

5 CONSULTANT BARTON: Do you have any sump  
6 pumps?

7 MR. AITKEN: There are no sump pumps, and  
8 we don't see any indications on the concrete of any  
9 water staining or coming in from the duct nodes.

10 CONSULTANT BARTON: No experience of any  
11 wetted cables in any of those manholes?

12 MR. AITKEN: That's correct. The water  
13 level is two feet below the cables. It's not to say  
14 if we had a 100-year flood and we saw any water in the  
15 yard, keep in mind where that manhole is and where the  
16 lake is, it's a significant drop off. So we really  
17 don't anticipate a problem. So we were comfortable  
18 making the commitment of at least every two years.  
19 But if we go in and we find something then we will  
20 adjust that frequency.

21 CONSULTANT BARTON: Okay, thank you.

22 The other question I've got is, you didn't  
23 mention anything about your refueling cavity leak.  
24 Can you tell us what that's all about and what you are  
25 doing about it?

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1 MR. WOOTEN: David Wooten for the  
2 applicant. The refueling cavity leak, we do have some  
3 leakage. And it presents itself as staining and sort  
4 of a damp wall. There is no real flow, no measurable  
5 flow that we can actually measure. It presents itself  
6 in two locations, on biological shield wall underneath  
7 the cavity, and also over on one of the steam  
8 generator output vault. And this upcoming outage we  
9 are going to do in some, an interim approach to try to  
10 identify the leakage, using vacuum box testing and NDE  
11 and some visual examination. And then we are also  
12 going to use Instacoat on the lower cavity area to try  
13 and isolate where the leakage might be.

14 CONSULTANT BARTON: You haven't seen any  
15 drippage or anything on any metal surfaces or anything  
16 as a result of this leak? Or has this leak increased  
17 any over the years since you've first seen it?

18 MR. WOOTEN: The leakage was first  
19 identified in 2006, and again in 2008. And there has  
20 been some slight puddling, some slight buildup of  
21 boric acid. The components that it has been on have  
22 been cleaned off, and we are monitoring it as we go.

23 MR. AITKEN: We find that the leak doesn't  
24 really manifest until several days after the cavity is  
25 filled. I think it was 16 or 17 days, Steve?

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1 MR. SORRELL: Correct.

2 MR. AITKEN: Before the leak actually --

3 CONSULTANT BARTON: Yes, if it's through a  
4 line someplace, and gets through the concrete, I had a  
5 similar leak and I know they are hard to find. But it  
6 looks like you got a program, you are going to start  
7 looking and see if you can identify it.

8 MEMBER STETKAR: One of the things I  
9 recall, and correct me if I'm wrong, you are also -  
10 you also have a leak area in the spent fuel pool; is  
11 that correct?

12 MR. WOOTEN: Correct, and the leakage out  
13 of the spent fuel pool presents itself in two areas.  
14 One is through the leakage collection system, through  
15 all of the 10 zones, about a liter a day. It also  
16 presents itself as some deposits on the drum room  
17 ceiling which is right below the spent fuel pool

18 MEMBER STETKAR: So you are going to take  
19 a core sample in that ceiling, right, to try to  
20 evaluate the effects of possible boric acid effects on  
21 rebar for example; is that correct?

22 MR. WOOTEN: That is correct. We are  
23 going to take two bores, one would be a petrographic  
24 core sample, and that would be right on the crack, and  
25 then we are also taking a compressive core sample a

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1 little bit off the crack to determine integrity of the  
2 concrete, and also exposed to rebar, so we can perform  
3 an inspection on rebar.

4 MEMBER STETKAR: You are going to use  
5 those results, I think I read somewhere, to infer the  
6 status perhaps inside the containment, the concrete  
7 rebar inside the containment. What is the normal  
8 boric acid concentration in the fuel pools, spent fuel  
9 pools?

10 MR. WOOTEN: About 2,600 ppm.

11 MEMBER STETKAR: What is the normal boric  
12 acid concentration in the refueling cavity when you  
13 are refueling?

14 MR. SCACE: During refueling it's greater  
15 than 2,500 ppm.

16 MEMBER STETKAR: So they are --

17 MR. SCACE: They're comparable.

18 MEMBER STETKAR: Okay, that's what I was  
19 looking for, thanks.

20 CHAIRMAN BONACA: For how long have you  
21 had a leakage?

22 MR. WOOTEN: For the spent fuel pool there  
23 is some indications back in the early '80s through the  
24 leakage collection system. As far as on the drum room  
25 ceiling, 2007 is when we first notified.

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1 CHAIRMAN BONACA: Okay, thank you.

2 MR. WOOTEN: And like I said, it presents  
3 itself, we'll clean it off and four or five months  
4 later it presents itself again. It's a real slow  
5 process. But it's not wet. It's just sort of - water  
6 comes out and evaporates.

7 CHAIRMAN BONACA: Okay, thank you.

8 CONSULTANT BARTON: You took an oil sample  
9 in May of 2009 on on 1V control room air conditioning  
10 chiller pump, and there were suspended particles when  
11 you looked at the oil. And you did the analysis. And  
12 they were identified as coming from the sealant tape  
13 you used on the pipe plug, am I right. Now it wasn't  
14 clear, and this is in the SER I saw this, it wasn't  
15 clear the corrective action that you guys to prohibit  
16 the use of this sealant tape on pipe lugs. And I  
17 don't know if you are setting yourself up for more  
18 tape dissolving and coming apart in your oil samples  
19 on rotating equipment, that's something you may want  
20 to follow up on and prevent a problem down the road.  
21 Because I'm not sure, you know, you stopped using that  
22 tape on these type plugs which could contaminate the  
23 oil.

24 MR. SCACE: I will share that insight,  
25 that suggestion with our maintenance personnel to make

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1 sure we have the proper controls in place with respect  
2 to sealant tape.

3 CONSULTANT BARTON: Okay, thanks.

4 MEMBER STETKAR: Last one, I know we are  
5 running over. Emergency diesel fuel oil day tanks,  
6 there was some discussing about sampling fuel oil in  
7 the day tanks, condition of the tanks and so forth.  
8 As I understand it there is a - the suction line  
9 inlet-outlet line to the diesel comes off a three-inch  
10 riser off the bottom of the tank, as best as I can  
11 understand, so that there is some volume of fuel in  
12 the tank below that riser. Do you have any idea how  
13 much?

14 You say that you sample regularly from the  
15 fuel oil line to the diesel, and I was curious when  
16 you do that sample. Do you normally pull the sample  
17 before you start the diesel, or do you pull the sample  
18 after the diesel is turned on and you've had a chance  
19 to stir up the contents of the tank a little bit? I'm  
20 curious about what contaminants might be in that tank  
21 that you did not find out about from a sample, and if  
22 you are only pulling a sample from that line for  
23 example when that tank has been stagnant for 30 days,  
24 or however frequently you test the diesel, you  
25 wouldn't know what was down there in the bottom.

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1 MR. AITKEN: We will have to look into  
2 that.

3 MEMBER STETKAR: Bring it back.

4 MR. AITKEN: Okay.

5 CHAIRMAN BONACA: Any other additional  
6 questions at this time?

7 MR. WEBSTER: I'm Bill Webster with the  
8 applicant. I just wanted to answer your question  
9 about the alert. What we did for the SAM analysis, we  
10 went back and used the standard for steam generated  
11 tube ruptures. So it's got to be incorporated in the  
12 induced tube rupture into the mode and that increased  
13 the lighting.

14 MR. AITKEN: I just had one last slide to  
15 go through, Mr. Chairman.

16 Kind of following up on the buried pipe,  
17 Kewaunee is keenly aware of the issues that have  
18 challenged the industry related to buried piping and  
19 the possibility of degradation going undetected. Here  
20 are some of the ways that our Kewaunee staff remains  
21 engaged with the industry events related to buried  
22 piping. Kewaunee as well as the other units within  
23 the Dominion fleet have committed to the NSIAC  
24 initiative, and NSIAC is the Nuclear Strategic Issues  
25 Advisory Committee through NEI, where the chief

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1 nuclear officers gather and make policy for the  
2 industry.

3           NSIAC initiative ensures that risk-  
4 significant buried piping and other buried piping that  
5 are important to plant operations and/or nuclear or  
6 environmental safety be periodically monitored for  
7 degradation. The implementation of this program is  
8 also being coordinated with a requirement stemming  
9 from the licensed aging management program.

10           Station staff continually evaluate  
11 external operating experience through a corrective  
12 action program as I mentioned earlier for issues that  
13 are applicable to the processes, programs and  
14 equipment at Kewaunee. Also we have a fleet lead as  
15 well as a site lead in place at each of our Dominion  
16 stations where program information is exchanged  
17 including industry operating experience through  
18 monthly working group calls. This information that is  
19 presented would cause a change to the buried pipe  
20 program, that would be initiated through this working  
21 group.

22           And lastly Dominion is an active member of  
23 the EPRI buried piping integrity working group where  
24 information is shared on an ongoing frequency. There  
25 was just a meeting two or three weeks ago down in

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1 Atlanta, and we were a part of that.

2 So a response to the buried pipe issue has  
3 been provided to the staff on July 22<sup>nd</sup>, 2010, and  
4 remains under review.

5 So I believe that is the end of our  
6 prepared remarks, and if you have any followup  
7 questions, we'd certainly like to answer them for you.

8 CHAIRMAN BONACA: Questions?

9 If not, we will take a break now, and  
10 resume at 10:30.

11 (Whereupon the above-entitled matter went  
12 off the record at 10:13 a.m. and went back on the  
13 record at 10:30 a.m.)

14 CHAIRMAN BONACA: Okay, let's get back  
15 into session, and now we have the presentation of the  
16 SER on the part of the staff.

17 NRC STAFF PRESENTATION

18 MR. HOLIAN: Yes, thank you, Chairman.  
19 Brian Holian again. I'll just start off. We did add  
20 a couple of other people to the table from license  
21 renewal staff. I previously had mentioned Jay  
22 Robinson as the branch chief. Ms. Caroline Tilton is  
23 a senior inspector our of Region 3, John Daly the PM.  
24 To John's right is Allen Hiser. He's the senior  
25 level adviser in the Division of License Renewal. He

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1 has had background in provision of component  
2 integrity, and in particular Allen is there for  
3 questions maybe on the steam generated divider plate  
4 and other issues. At his right is Dave Pelton.

5 He's another technical branch chief in the Division  
6 of License Renewal, and was also involved in  
7 particular on the work control process review, and his  
8 staff.

9 I wanted to introduce one other person in  
10 the back of the room. He's not always here, but Jim  
11 Gable is a senior inspector from Region 3, in the back  
12 room there standing up. He is a Division of License  
13 Renewal employee, and we use him out of Chicago  
14 office. He was on the license renewal audit for  
15 Kewaunee, quite a few of our audits he goes out on.  
16 He's been a long-time, 24-plus-year mechanical  
17 engineer out of Region 3. Did a lot of work on Davis-  
18 Besse for two or three years, and we pick him up as  
19 one of our employees, and he's here today and I wanted  
20 to recognize that.

21 With that I'll turn it over to John Daily.

22 MR. DAILY: Thanks, Brian.

23 Good morning. My name is John Daily. I'm  
24 the project manager for the Kewaunee Power Station  
25 license renewal review project. We will discuss the

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1 staff's review of the Kewaunee license renewal  
2 application as documented in the Safety Evaluation  
3 Report with open items. Next slide.

4 We have an outline of today's presentation  
5 as shown here. First of all an overview of the  
6 Kewaunee Power Station license renewal review, and we  
7 will cover a summary of the results from SER Section  
8 2, the scoping and screening reviews. Next we will do  
9 a presentation on the results of the Region 3 license  
10 renewal inspection.

11 Then we will cover a discussion of SER  
12 Section 3, the aging management program and AMR  
13 results along with the open items that resulted with  
14 them.

15 And finally a discussion of topics out of  
16 SER Section 4 the time limited aging analysis.

17 Most of the information on this overview  
18 slide was already covered by Dominion in their  
19 presentation so we won't be repeating it all again,  
20 it's just here for reference purposes. You can go to  
21 the next slide.

22 Staff review teams conducted audits and  
23 inspections for the application during the periods as  
24 shown here on this slide of audits and inspections.  
25 The main aging management program audit was conducted

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1 June 9<sup>th</sup> through 12<sup>th</sup> of 2009, and it was conducted at  
2 the Kewaunee site. Then later on during October,  
3 during the week of October 19<sup>th</sup> and 20<sup>th</sup>, we conducted  
4 an audit of the revised work control process aging  
5 management program. In addition Region 3 conducted  
6 its regional inspection in the timeframe of August to  
7 September, 2009, and of course their inspection  
8 results will be presented shortly.

9 In preparing the safety evaluation report,  
10 and in addition to the audits and inspections we  
11 already mentioned, the staff conducted in depth  
12 technical reviews and issued over 240 requests for  
13 additional information to which the applicant has  
14 responded with further information.

15 As Dominion had covered during their  
16 presentation, one issue in particular that impacted  
17 the project schedule concerned Dominion's designation  
18 and use of its work control process maintenance  
19 program. Of course they have covered most of the  
20 details there. We did mention that as a result of the  
21 resubmittal in answer to the staff's concerns in  
22 September of 2009 the schedule required a revision,  
23 and of course we added two months on to the review  
24 schedule in order to accommodate this new information  
25 that had been submitted. The SER with open items was

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1 issued to the applicant on July 16<sup>th</sup>, 2010. As an SER  
2 it contains four open items which are summarized here.

3 The use of Fatigue Pro software and metal fatigue  
4 calculations; concerns with potential primary water  
5 stress cracking corrosion in the nickel alloy steam  
6 generator plates, divider plates. Number three was  
7 concern incorporating recent operating experience for  
8 buried and underground piping and tanks. And finally  
9 some issues that were identified in the revised work  
10 control process program.

11 Of course we will be covering each one of  
12 those in detail later on in the presentation.

13 This slide presents our summary of the  
14 results for SER Section 2. Section 2 covers the  
15 structures and components that are subject to an aging  
16 management review, along with the results, the  
17 subsections which we will summarize briefly here  
18 below. Under Section 2.1 which is the scoping and  
19 screening methodology reviews, one of the things to  
20 note here is that as a part of this audit, the scoping  
21 and screening audit, the staff utilized for the first  
22 time an independent key word search of the applicant's  
23 condition reports, corrective actions, operating  
24 experience and so forth, all of that data. We used  
25 that keyword search as a method of identifying

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1 material and aging effects that could be of interest.

2 The results from this search were then passed on to  
3 the aging management program audit staff for their use  
4 in determining whether the applicant has considered  
5 all of the relevant age related issues during the  
6 development of their applicable AMPs.

7 And then the conclusion to Section 2.1 is  
8 shown here. We did find that the methodology was  
9 consistent with the requirements of the rule, 10 CFR  
10 54.4, and 54.21.

11 The plant level scoping results which were  
12 conducted in accordance with Section 2.2. The systems  
13 and structures finding was that they were within the  
14 scope of license renewal and they were appropriately  
15 identified following the request for additional  
16 information on things that were submitted in  
17 accordance with 10 CFR 54.4.

18 And then the actual scoping and screening  
19 results which are covered in Section 2.3 through 2.51  
20 we found that the SSCs within the scope of license  
21 renewal were appropriately identified in accordance  
22 with, again, the rule, and those subject to an aging  
23 management review were appropriately listed in  
24 accordance with 10 CFR 54.21(a)(1).

25 Next slide. At this point Caroline Tilton

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1 will present a discussion of the Region 3 license  
2 renewal inspections.

3 MS. TILTON: Good morning. My name is  
4 Caroline Tilton, and I am the team lead of Kewaunee's  
5 license renewal inspection.

6 For the last year Kewaunee has been in the  
7 licensing response column of the action matrix with  
8 all cornerstones green. For these inspections we  
9 follow inspection procedure 71002. This was a two-  
10 week inspection conducted the week of August 17<sup>th</sup> and  
11 August 31<sup>st</sup>, 2009. Our inspection team consisted of  
12 five inspectors and a regional ops server.

13 We performed both parts of the procedure,  
14 the scoping and screening, and the aging management  
15 program review.

16 The inspectors performed walkdowns on  
17 portions of 10 systems. These walkdowns were intended  
18 to determine the acceptability of the scoping  
19 boundary; to observe the current condition of the  
20 structure, systems and components; and to assess the  
21 likelihood that the proposed aging management program  
22 would successfully manage aging effects.

23 For the scoping and screening section the  
24 team performed walkdowns of selected systems. Overall  
25 the scoping and screening drawings had adequate

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1 division between nonsafety and safety related. There  
2 were a few instances in which minor discrepancies were  
3 identified between the drawing and the actual plant  
4 configuration. These instances were adequately  
5 addressed and corrected by the applicant.

6 MEMBER SHACK: There was some discussion  
7 in the report of this notion of a collapse envelope  
8 which seemed to be a nonstandard kind of terminology.

9 Was that sort of reviewed and found that it was just  
10 their terminology for what was an acceptable practice?

11 MR. DAILY: That did come up during the  
12 scoping and screening audit, and we got one of our  
13 staff members here who can explain that for you.

14 MR. ROGERS: Good morning. I'm Bill  
15 Rogers. I'm with the Division of License Renewal. We  
16 considered that during the scoping and screening  
17 methodology audit and our review associated with that.

18 I did note that that term was new to me, I hadn't  
19 seen that before, and I brought that to the  
20 applicant's attention. So what we did when we were on  
21 site, we discussed how that fit into their process.  
22 And we actually went and walked it down.

23 So what that related to was essentially  
24 tanks at floor level atmospheric pressure, so they  
25 would just have some static head, and it would be able

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1 to leak basically below the fluid level in the tank.

2 So we took one of these examples, we  
3 walked down the room, we looked at the location of the  
4 tank, the location of any safety-related equipment  
5 that might be affected. And then of course the way  
6 the equipment was situated such that there would be  
7 mitigative features in between the potential fluid  
8 path and the --

9 MEMBER SHACK: Oh, so this was solely for  
10 tanks?

11 MR. ROGERS: Tanks at atmospheric  
12 pressure. And if I'm correct they were all at floor  
13 level. So it was unusual enough that we walked it  
14 down, looked at it. We discussed it with the  
15 applicant. They considered that the term, collapse  
16 envelope, was maybe a refinement of the ideas  
17 contained in 95.10 as opposed to an exception, and  
18 when I read the response and applicant, concerning the  
19 walkdown and the discussions, I found that to be  
20 acceptable. But I did feel it was something that we  
21 needed to look at.

22 MEMBER STETKAR: I am kind of a simple  
23 minded person. I have a tank right here. It looks  
24 like a coffee cup at atmospheric pressure sitting on  
25 the floor. What is the collapse enveloped for this

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1 tank sitting on the floor look like? What is it?

2 MR. ROGERS: Here is what our conclusion  
3 was on that. If you just got rid of the tank, where  
4 would the fluid go? The enveloped, you would start  
5 with the tank leaking and whether it would have the  
6 potential to spray on any associated equipment, and if  
7 the tank were to fail completely how would the entire  
8 contents of the fluid affect any equipment in the  
9 room.

10 MEMBER STETKAR: Okay, so it's not just  
11 strictly a submergence, volumetric submergence. It  
12 has something to do with splashing or spray?

13 MR. ROGERS: No, it has to do with volume.  
14 So one thing we did make sure during the walkdown, we  
15 reviewed the position and the mitigating effects.  
16 There are berms and platforms for the safety related  
17 equipment, and the applicant had looked at that and we  
18 had looked at that, you could make a reasonable  
19 assessment that the volume wouldn't affect the  
20 equipment in the room.

21 So if you go from A to B, from a small  
22 leak to a release of a volume, it seemed like it had  
23 been bounded either way, so we accepted that. But --

24 MEMBER SHACK: It could include the  
25 effects of both the spray and the flooding?

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1 MR. ROGERS: Yes, it did. Because  
2 actually the applicant addressed in their response to  
3 the RAI that they considered a through-floor  
4 distribution of the fluid, all of that had been  
5 considered.

6 MEMBER SHACK: Okay, thank you.

7 MR. ROGERS: Okay, you're welcome.

8 MS. TILTON: For the aging management  
9 program the team reviewed a sampling of 24 out of the  
10 34 aging management programs. This would have  
11 included programs implementing documents and  
12 procedures; lock downs; and interview of plant  
13 personnel.

14 As a result of our aging management  
15 program review, several issues were identified.  
16 Related to the buried piping and inspection program,  
17 the inspectors found that a procedure triggered an  
18 engineering evaluation to be performed when the  
19 measured wall thickness was less than 75 percent  
20 instead of the standard 87.5 percent. This 75 percent  
21 acceptance criteria could potentially be nonconforming  
22 to the design basis.

23 The applicant produced a new procedure  
24 intended to replace the existing procedure. However  
25 it was still in draft status. The applicant initiated

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1 corrective actions, determined that the existing  
2 procedure had not utilized the potentially  
3 nonconservative acceptance limits, and placed adequate  
4 restrictions for its use.

5 Related to the compressed air monitoring  
6 program, there were two areas identified where the  
7 applicant --

8 MEMBER BROWN: Before you leave that,  
9 could that 75 percent limit, could that be used for  
10 any other evaluations? Or this a go forward type  
11 procedure? Did I phrase my question properly?

12 MS. TILTON: Yes, I don't understand.

13 MEMBER BROWN: I'll try again. You said  
14 they had identified the incorrect wall thickness that  
15 they were using 75 percent as opposed to 87.5 percent  
16 or something.

17 MS. TILTON: They actually never used the  
18 75 percent, and the procedure said that 75 percent is  
19 an acceptance criteria.

20 MEMBER BROWN: But they had not used this  
21 procedure for anything up to this point anyway?

22 MS. TILTON: Correct.

23 MEMBER BROWN: Okay, thank you.

24 MS. TILTON: Related to the compressed air  
25 monitoring program there were two areas identified

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1 where the applicant intended to take exceptions to the  
2 GALL that were not noted in the application. These  
3 two exceptions were, performing air quality  
4 measurements, and trending of air quality sampling  
5 result. The applicant agreed to amend the application  
6 to include these two exceptions with the appropriate  
7 justification.

8 Related to the external --

9 MEMBER STETKAR: Caroline, let me stop you  
10 on the compressed air. I had a couple of questions.  
11 I notice they had three instrument air dryers, 1A, 1B  
12 and 1C, and for some reason instrument air dryer is  
13 excluded - 1B is excluded from the scope of license  
14 renewal, and the justification for that seems to be  
15 that their Appendix R fire response procedures say  
16 that you go isolate instrument air dryer B when you  
17 know you have an Appendix R fire event. The  
18 instrument air system during normal operation doesn't  
19 know anything about Appendix R fires, so I'm curious  
20 how anything to do with Appendix R fires has to do  
21 with the use of that particular instrument air dryer  
22 to maintain the air quality during the 366 - I'm  
23 sorry, 365.25 days per year when you don't have  
24 Appendix R fires, given the fact that they are pretty  
25 much less frequent than one per year, how can you

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1 justify excluding that air dryer?

2 MR. DAILY: That may involve the actual  
3 classification and reasons for the dryers themselves,  
4 and maybe our staff or maybe Dominion might like to  
5 explain how the dryers are classified and why that was  
6 that way.

7 MR. RODILL: Yes, Ben Rodill with  
8 Dominion. Basically the air compressors and the  
9 dryers are nonsafety related. There were two  
10 compressors that were credited for Appendix R, and  
11 either on dedicated or alternate shutdown. And we  
12 included conservatively all the compressors in scope.  
13 And then one dryer was excluded from scope on the  
14 basis that our procedures clearly have enough time to  
15 allow operators to isolate the dryer that is not  
16 credited for that event.

17 MEMBER STETKAR: If I go to the plant and  
18 just randomly walk in at any given time, what is the  
19 likelihood that air dryer 1B will indeed be in  
20 service?

21 MR. RODILL: I am not quite familiar with  
22 the operation of the dryers from day to day.

23 MR. WOOTEN: Dave Wooten from the  
24 applicant. We typically just operate air dryer  
25 Charlie. Air dryer alpha and bravo and just used as

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1 backups.

2 CHAIRMAN BONACA: I didn't hear what you  
3 said.

4 MR. WOOTEN: We have three air dryers,  
5 alpha, bravo and charley. Typically we only run air  
6 dryer charley, and air dryer bravo and alpha are just  
7 used as backups.

8 MEMBER STETKAR: You didn't quite answer  
9 my question, because having quite a bit of experience  
10 with air systems and air dryers, they are not the most  
11 reliable pieces of equipment in the world. So  
12 although charley might be normally lined up, I suspect  
13 that alpha and bravo indeed are operating some  
14 fraction of the time. And I was asking specifically  
15 for what fraction of time bravo might be in service.

16 My point is that if it's normally  
17 operating to maintain quality of the air system, and  
18 if the fire protection program takes credit for the  
19 availability of air to operate certain pneumatic  
20 devices during a fire event, the status of air dryer  
21 bravo indeed has some effect on the quality of said  
22 air. The effect depends on how often it's actually  
23 operated, but indeed it affects the quality of that  
24 air system.

25 So it's not clear to me simply because at

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1 the point of a fire you can go valve it out, that it's  
2 historical performance hasn't had some effect on that  
3 air out in the lines, way out where the pneumatic  
4 devices exist. So I was really curious about why it  
5 should be excluded, particularly since you have  
6 included all three compressors.

7 MR. DAILY: So particularly if that air  
8 dryer were on service when the event happened --

9 MEMBER STETKAR: Or had been in service 50  
10 percent or 33 percent of the time for the last 25  
11 years and it had problems, the problem with air  
12 systems is contaminates tend to accumulate way out at  
13 the ends of things, for example if that air dryer  
14 wasn't doing its job and oil and moisture had been  
15 getting through accumulating on for example solenoids  
16 or air operated valves, they might not work. Even  
17 thought it might not have been in service even when  
18 the fire happened, or you might have valved in a  
19 really good air dryer when the fire happened, the air  
20 system doesn't know about that historical operating  
21 experience.

22 MR. DAILY: I think that is something that  
23 we may need to look into and discuss with Dominion and  
24 find out what would be the proper dispensation for  
25 that air dryer.

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1 MR. HOTCHKISS: Let me just make one maybe  
2 clarification. This is Mark Hotchkiss from Dominion.

3 The air dryers are credited as part of a compressed  
4 air monitoring and quality control system. They  
5 certainly are maintained at the plant, and continue to  
6 operate when necessary, and operate and function  
7 correctly. And as far as the compressor monitoring  
8 program, we sample the air, we maintain a quality of  
9 the air itself which would lead us back to air dryer  
10 problems.

11 Now from a scoping license renewal scoping  
12 standpoint the air dryers did not meet the criteria to  
13 be in scope; in other words they were not safety  
14 related, and they were not a support system necessary  
15 for safety related equipment to function. However for  
16 the Appendix R a certain air dryer did meet that scope  
17 and criteria, so that air dryer which was, what,  
18 alpha, two of them met that criteria so they are in  
19 scope. But I think your question is related to  
20 compressed air quality, so that is the point, our  
21 program maintains the compressed air quality by  
22 sampling.

23 MEMBER STETKAR: Let me - because that  
24 question is about air sampling also and bypasses the  
25 air dryers. Your air quality sampling point is taken

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1 off the header after the dryers, so you know the  
2 quality of the air at the main distribution head. Do  
3 you do any air sampling way out at the ends of the  
4 lines so you know for example the moisture or oil  
5 content of the air out at the end users?

6 The concern is, I used to operate at a  
7 plant that had air problems, because we had air dryer  
8 problems, and they were bypassed quite frequently, and  
9 oil and moisture migrated down the length of our air  
10 lines, and they tended to varnish in place a lot of  
11 solenoid operated valves; you basically cooked the  
12 oil and made it a varnish. So unless you know the  
13 quality of the air or have some means of determining  
14 that the pneumatically operated devices are doing  
15 well, just sampling the air quality at the outlet of  
16 the dryer doesn't necessarily tell you much especially  
17 if you are bypassing the dryers pretty frequently.

18 So the question on air sampling is, do you  
19 do any end-use air sampling or at least have a regular  
20 blowdown program to blow down the lines at the end  
21 users?

22 MR. AITKEN: Paul Aitken from the  
23 applicant. We don't have that information right now,  
24 so we will have to get back to you on that.

25 MEMBER STETKAR: Okay, thanks. I

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1 recognize the licensing concerns and the restrictions  
2 on Appendix R and all of that stuff, but ultimately  
3 what we care about is what is the quality of the air  
4 at the end users when they need it. And in license  
5 renewal space if the only end users are a certain  
6 subset of air operated devices, I'm assuming there  
7 is some valve some place, well that is fine. But the  
8 historical performance of the system up to that point  
9 determines what that quality is.

10 MR. PELTON: Let me just leave you with  
11 two thoughts, too. When we look at the compressed air  
12 monitoring program, it was a program that was largely  
13 built to attempt to take credit for an existing series  
14 of generic letters, part of which were based on some  
15 of the experiences you mention, the varnishing  
16 effects, system in leakages and other events that have  
17 contributed to failures of the instrument air system  
18 to operate appropriate. So as licensees were  
19 implementing programs to address those generic events,  
20 when we looked at this program and said, well, if you  
21 take credit for the actions you have already put in  
22 place and just refer to it by, oh by the way it's also  
23 an aging management program and it meets the elements  
24 of the generic aging lessons learned report, all is  
25 good. Alternatively the passive and long-lived

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1 functions of these systems depending on which portions  
2 actually are within the scope of license renewal, is  
3 largely as a pressure boundary. So it would be  
4 pressure boundary capability at piping in valve  
5 bodies, which can be effectively managed through using  
6 our internal inspection program. So it's not unusual  
7 for a licensee or an applicant in this case to  
8 propose, so I guess - John made a great point, which  
9 is we can further explore and make sure that we inform  
10 you folks on what are the efforts right now or the  
11 actions that licensees are supposed to have in place  
12 to address the overall performance and ability of the  
13 system to function when called upon, versus the aging  
14 management perspective of the in scope portions. We  
15 can get that.

16 MEMBER STETKAR: Okay. One thing before I  
17 give up on the compressed air stuff, I was a bit  
18 disturbed by a quote in the SER that it talked about  
19 concerns about bypassing - or the air dryers and  
20 bypassing the air dryers, and the staff --- here is a  
21 quote, the staff finds the applicant's procedure  
22 including the establishment of the pressure setpoints  
23 to bypass the dryers is adequate to manage the aging  
24 effects because the bypass of the dryer with the high  
25 differential pressure value greater than the setpoint

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1 can mitigate the potential degradation of air quality  
2 and its adverse effect on the degradation of the  
3 components in the system.

4 Bypassing an air dryer is the worst thing  
5 you can do for air quality. The more you bypass an  
6 air dryer, the worse the air eventually gets. So I  
7 was curious if the staff concluded something was good  
8 because you could bypass these air dryers.

9 MR. PELTON: Dr. Minh can speak to that.

10 DR. MINH: First of all for the air  
11 quality questions, I understand Frank Shiff, Dave  
12 Pelton, mentioned about the approaches of the air  
13 quality control. Let me add just one comment. One of  
14 the basis elements we accepted applicant's approach  
15 with just one problem. Not measuring the air quality  
16 at various locations but at point was that one of the  
17 references like associates EPRI NP 70-79 also  
18 recommends the air quality check downstream of the  
19 dryer so that there is a reasonable assurance that the  
20 air supply into the pressurized system is adequately  
21 checked, and that would be the reasonable air quality  
22 fed into the pressurized system. And that was another  
23 one.

24 And the other one is that my understanding  
25 was that the dryer LP reflects the condition of the

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1 dryer so if the LP is too high then the dryer is not  
2 working well, and bypassing the dryer will lead to the  
3 initiation of the corrective actions and so on; that  
4 was my understanding. However the applicant can add  
5 some more comments on their actions there for further  
6 clarification.

7 MR. DAILY: Perhaps one of the issues in  
8 bypassing the air dryer is if the station routinely  
9 bypasses it without placing another air dryer in  
10 service. I was at a plant once before, and they had  
11 many air problems, but as far as actual experience and  
12 performance at the station at Kewaunee, how often does  
13 an air dryer get bypassed with no other air dryer  
14 being placed in service in that case?

15 MR. HOLIAN: This is Brian Holian. We can  
16 take that question. I think the SER statement that I  
17 take out of this, other than the previous discussion,  
18 the SER statement, the because statement, is an item  
19 we look at, and we need to look at. And we don't want  
20 to overstate or understate the conclusion.

21 MEMBER STETKAR: If it's the only  
22 automatic action you certainly don't want to block the  
23 airflow, but you certainly don't want to say, because  
24 you can bypass it it's okay.

25 MR. HOLIAN: We don't want the conclusion

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1 to make it sound like that, and we'll work that issue.

2 MEMBER STETKAR: The bypass line, I don't  
3 know where you take the air sample, but I did look at  
4 the PNID, and the bypass line not only bypasses the  
5 dryers, it also bypasses the downstream filters from  
6 the dryers, so whatever is in the supply from the air  
7 compressor goes into the header and migrates wherever  
8 it wants to go from that point forward.

9 MR. DAILY: We will need to explore that  
10 with the station and find out what actually happens  
11 and revisit that. I think that is an excellent point.

12 MS. TILTON: The related exceptions within  
13 the compressor monitoring program, the applicant  
14 agreed to amend the application to include these two  
15 exceptions with appropriate justification.

16 Related to the external surface monitoring  
17 the inspectors found two deficient areas. Instructions  
18 lacked specific requirements to focus on identifying  
19 aging effects, and walkdown checklists did not include  
20 an attribute of corrosion on uncoated surfaces.

21 In response the applicant agree to revise  
22 these instructions and procedures to adequately  
23 address these deficiencies.

24 Related to the metal fatigue of reactor  
25 coolant pressure boundary, the inspectors found that

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1 fatigue monitoring of the reactor coolant hot leg heat  
2 exchanger was not included in the program. Our report  
3 concluded that defined cycles for the heat exchange  
4 would be exceeded prior to the end of extended  
5 operation. The applicant initiated follow up action  
6 to ensure adequate fatigue monitoring for the reactor  
7 coolant hot leg sample heat exchanger.

8 Our team review resolved, related to the  
9 incorporation of operating experience into each  
10 program. The inspectors were unclear whether the  
11 applicant considered external operating experience for  
12 the aging management program. Specifically the  
13 operating experience section within the aging  
14 management program binders only had examples of  
15 internal operating experience.

16 The inspectors questioned the applicant  
17 and reviewed additional documentation. As a result  
18 the inspectors concluded that external operating  
19 experience is being identified, reviewed, evaluated  
20 and tracked, and factored into the aging management  
21 program to ensure program effectiveness.

22 Overall scoping of nonsafety systems,  
23 structures and components and application of the aging  
24 management program to those SSCs was acceptable.  
25 Document supporting the application was auditable and

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1 retrievable. And based on the review of the selected  
2 sample our inspection results support the conclusion  
3 there is reasonable assurance that the effect of aging  
4 will be adequately managed.

5 CHAIRMAN BONACA: Regarding the corrective  
6 action reports for operating experience, I agree that  
7 I'm sure that they review operating experience of  
8 sister plants and reflect that. The problem still  
9 remains that when I look at the programs in Appendix B  
10 the only references are always made to the experience  
11 of the plant, and it's hard to believe there isn't  
12 some inclusion about the experience that could be  
13 brought to bear there.

14 MS. TILTON: During our review initially  
15 we found that the only examples we had of operating  
16 experience being factored into the aging management  
17 program were internal examples. Again, as I  
18 mentioned, after further review, they do incorporate  
19 external operating experience within their corrective  
20 action program. Therefore examples that were brought  
21 up through their corrective action program had  
22 reviewed external operating experience.

23 CHAIRMAN BONACA: I understand. I guess  
24 I'm not communicating correctly. It seemed to me that  
25 there has to be some advance out there in the industry

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1 that other people have experienced, and Kewaunee has  
2 not. And yet in the case I would see a reference to  
3 the experience of the industry that was not the  
4 experience of Kewaunee.

5 MR. DAILY: What you seem to be asking is  
6 whether or not there is documentation of plant XYZ has  
7 this issue, we reviewed it and we did these 123  
8 actions as a result.

9 CHAIRMAN BONACA: Yes, that's exactly  
10 right. I would expect in one case or three cases you  
11 would have some examples. There are none. And that's  
12 what is striking to me.

13 MR. DAILY: Maybe we could as former staff  
14 members might be able to --

15 MR. ROGERS: Bill Rogers, Division of  
16 License Renewal. Actually we discussed that during  
17 the scoping methodology audit. What we initially did  
18 is we had the applicant management staff give a  
19 presentation, an overview presentation on how they  
20 considered operating experience in general. And  
21 during that presentation they went through the process  
22 of looking at the internal operating experience, how  
23 they went through the database, and also how they  
24 considered the external operating experience. And  
25 relative to your question, one thing we did ask them

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1 is how did you determine what OE to put inside your  
2 binders, your AMP binders. And the answer was, they  
3 had determined to include representative examples in  
4 the binders. And representative examples were ones  
5 that they thought were probably most illustrative of  
6 the AMPs in particular.

7 So it's really a small sample and a small  
8 representation of the overall look that they did. So  
9 we reviewed that during our audit, and in addition the  
10 regional office did that during their inspection. So  
11 although it's not really represented in the binders,  
12 it was pretty clear that the applicant had considered  
13 that during the overall process.

14 CHAIRMAN BONACA: And I appreciate it.  
15 I'm not going to open it up, because I trust the fact  
16 that you performed an inspection, so that confirms the  
17 experience. Thank you.

18 MR. DAILY: We may actually have heard one  
19 example even this morning during Dominion's  
20 presentation on the reactor vessel had replacement  
21 because of industry concerns with the CDRM cracking.

22 However, I guess maybe your comment is  
23 that it's unfortunate that that didn't show up in the  
24 LRA application itself.

25 CHAIRMAN BONACA: I was thinking just

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1 about the example. That's a big one. They had no  
2 problems there, and that's wonderful, but they took  
3 actions to replace the head.

4 MR. DAILY: They wanted to do that instead  
5 of maybe some other plants which should remain  
6 anonymous in other parts of the country, what they do.

7 CHAIRMAN BONACA: Okay.

8 MR. DAILY: Thanks Caroline for that  
9 presentation. If there are any other questions on the  
10 regional inspection?

11 CONSULTANT BARTON: Yes, I have a  
12 question. On the inspection report it seems that the  
13 team performing walkdown inspections, for quite a bit  
14 of systems, and you had the opportunity to get inside  
15 containment. What is your assessment of the overall  
16 material condition of the site?

17 MS. TILTON: Per our assessment the  
18 overall material condition was good inside  
19 containment. The rest of the inspectors performed  
20 mode three post-shutdown walkdowns last year during  
21 the refueling outage, and they came to the same  
22 conclusion. They found no items of concern.

23 CONSULTANT BARTON: Thank you.

24 MR. DAILY: Thanks, Caroline.

25 Now let's move on to SER Section 3, aging

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1 management programs. And aging management reviews,  
2 and we had several topics that we will be bringing up.

3 The applicant submitted and the staff  
4 reviewed 34 aging management programs. And over 4,800  
5 aging management review line items. Of these 34 AMPs  
6 13 programs were presented as consistent with the GALL  
7 report. One was considered a plant specific program;  
8 seven as consistent with exceptions; eight with  
9 enhancements; and then five programs were presented as  
10 consistent with both exception and enhancements. So  
11 that is just a breakdown of where the aging management  
12 programs actually fell in the matrix.

13 As a result of the staff's review of the  
14 aging management programs and aging management  
15 reviews, four open items were identified which again  
16 are summarized here, and we will now discuss those in  
17 the following slides. And of course some of this may  
18 seem as a repeat from Dominion's this morning. It's  
19 not intended to be a complete repeat, but perhaps we  
20 will give some of the staff's perspective in some of  
21 these slides.

22 The first open item relates to the issue  
23 of Fatigue Pro and the applicant's metal fatigue  
24 calculations. The staff noted that the applicant's  
25 aging management program relies upon this software in

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1 order to perform certain fatigue calculations as  
2 indicated in the application Section B 3.2. As the  
3 ACRS is aware, staff has issued a regulatory issue  
4 summary, No. 2008-30, which discusses this issue  
5 concerning Fatigue Pro and it's stress-based fatigue  
6 module in that it does not use all six components of a  
7 transient stress tensor in order to perform the  
8 analysis. Whereas the ASME code, Section 3,  
9 subarticle NB-3200, does recommend and call for use of  
10 all six of those components.

11 The RIS recommends that license renewal  
12 applicants who use this simplified calculation  
13 methodology need to perform some confirmatory analyses  
14 in order to demonstrate that their simplified approach  
15 provides acceptable results. This open item affected  
16 two RCS components: pressurizer surge line hot leg  
17 nozzle, and the charging leg nozzle. Dominion has  
18 agreed to perform confirmatory analyses on these two  
19 components. They submitted the results, and a summary  
20 report, to the staff on June 1<sup>st</sup>, which showed their  
21 effort to resolve this item, and the staff of course  
22 now is in the process of reviewing this response, and  
23 we will be confirming its acceptability for the final  
24 SER.

25 The second item identified concerns

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1 related to primary water stress cracking and corrosion  
2 in the applicant's LA600 steam generator divider  
3 plates. The staff noted that recent foreign operating  
4 experience in recirculating steam generators with a  
5 similar design to Kewaunee's has identified noticeable  
6 cracking due to primary water stress cracking  
7 corrosion in the upper portion of the steam generator  
8 divider plates, even with proper primary water  
9 chemistry. Specifically cracks have been detected in  
10 the sub runner divider plate area, and some of them  
11 even going to depths of approximately one-fourth to  
12 one-third of the way through the wall in the divider  
13 plate thickness. Therefore the staff is concerned  
14 that the primary water chemistry program alone might  
15 not be totally effective in managing these aging  
16 effects of cracking due to PWSCC, and we issued an RAI  
17 to the applicant on March 26<sup>th</sup> of this year requesting  
18 that the applicant discuss the materials of their  
19 steam generator divider plate assemblies. If these  
20 materials are susceptible to cracking, for example, if  
21 it's alloy 600 materials instead of alloy 690, then to  
22 discuss the potential that cracking of the divider  
23 plate might propagate into other components, for  
24 example, up into the tube sheet platter, or into the  
25 RCS steam generator head, the channel head or the

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1 triple point.

2 Finally the staff requested that a  
3 propagation into these components cannot be positively  
4 ruled out, the applicant should describe an inspection  
5 program ensuring that there are no cracks propagating  
6 into other items that could challenge the integrity of  
7 the RCS pressure boundary and so forth.

8 And on July 22<sup>nd</sup>, as Dominion mentioned,  
9 they provided the RAI response. Staff is no in the  
10 process of going through that process, and will  
11 confirm its acceptability during the final SER.

12 MEMBER ARMIJO: Can you provide a little  
13 more detail on that cracking? Is it in the - does it  
14 initiate in welds in the divider plate, or is it on  
15 the bulk material? A little more information.

16 MR. DAILY: We have some extra slides we  
17 can throw up onto the screen here, and perhaps Dr.  
18 Hiser might be able to --

19 MR. HISER: These are not in the weld  
20 material itself. Maybe in the heat affected zone but  
21 it's in the base material.

22 MEMBER ARMIJO: Of the divider plate stub  
23 runner.

24 MEMBER SHACK: But it is in the high  
25 residual stress area, then?

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1 MR. HISER: Presumably, yes. Presumably.  
2 MR. DAILY: Yes, these examples apparently  
3 were detected first in several inspections that were  
4 done in France as well as up in Sweden with the  
5 Ringhals plant. And we actually have some slides that  
6 are - we have a transferee that is over working with  
7 us from the French Nuclear Regulatory Agency who was  
8 involved in some of this, and they were willing to  
9 provide a couple of examples of cracks. This  
10 particular crack here was in the stub liner area of  
11 the divider plate, and it shows intragranular nature,  
12 which this is a micrograph etching that was lifted and  
13 placed under the microscope so that they could  
14 photograph it. And it shows how it propagates along  
15 the grain boundaries.

16 CONSULTANT BARTON: These are not  
17 Kewaunee, though?

18 MR. DAILY: No, these are foreign slides.

19 (Laughter)

20 MR. HISER: One of the concerns we on this  
21 is that French plants have looked, numerous plants  
22 have identified cracks, and U.S. plants have not  
23 looked. So we don't know what condition it is.

24 MR. DAILY: We have no data.

25 MEMBER ARMIJO: And the materials are

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1 common, the water chemistry are common. Are the  
2 designs similar enough the stresses would be --

3 MR. HISER: There may be some differences  
4 in some of the geometry, some of the gross geometry  
5 thicknesses and things like that. It's not clear how  
6 that would affect the propensity for cracking or  
7 propagation of the cracking. And again we know that  
8 there is in similar materials, components, structures,  
9 cracking; we don't know what the condition is.

10 MEMBER ARMIJO: What was the duration of  
11 time before the French detected these cracks?

12 MR. HISER: I believe 20 years, somewhere  
13 within the first 20 years was when some of the younger  
14 steam generators where they were detected --

15 MR. DAILY: Most of this data that we have  
16 here that was shared with us is from the mid-2000s.  
17 2004 to 2009 timeframe. Those steam generators are  
18 Westinghouse-licensee constructed model steam  
19 generators. They were included in the subject EPRI  
20 that had also looked at similar issues. So --

21 MR. HISER: Some of the other background,  
22 multiple inspections of the same steam generator, if  
23 you go in and do an inspection and you find some  
24 degradation, you don't know, is it prior, is it  
25 ongoing, so you come back and look again. In this

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1 case they found a certain population of flaws, came  
2 back the second time and found additional flaws. Now  
3 it looked like the first flaws that they identified  
4 maybe were not continuing to progress. But the  
5 continued initiation of flaws and possible coalescence  
6 of these is the kind of phenomena that we are  
7 concerned about.

8 MEMBER ARMIJO: But not through the  
9 divider plate itself?

10 MR. HISER: They do not appear to go  
11 through wall extensively.

12 MEMBER SHACK: What, they initiate on the  
13 hot leg side and then --

14 MR. DAILY: Most of them apparently have  
15 been found on the hot leg side. I do believe that a  
16 couple have been found on the cold leg side. And the  
17 maximum depth is approximately 8 out of 34 millimeters  
18 according to the data that we got.

19 MR. HISER: The one concern that we have  
20 is that the industry has done some evaluations, and  
21 the staff generally agrees that the cracking in the  
22 divider plate itself is not a safety concern, so we  
23 have not issued a generic letter or any other generic  
24 guidance because we in the Part 50 realm at least it's  
25 not a safety concern. But we now issue a license for

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1 a plant to go to 60 years, there is the potential that  
2 they have a degraded component. We don't want to find  
3 new phenomena, year 59, that these cracks can grow  
4 into the kiting or out into the base material and  
5 cause a reactor coolant leakage. That's the kind of  
6 thing that we want to avoid.

7 MEMBER ARMIJO: Yes, Alan, that picture  
8 you are showing there, is that sort of a dye penetrant  
9 picture of a crack? What are you looking at there?

10 MR. DAILY: I believe this is a composite  
11 of several photographs of a long section in the stub  
12 runner, and this is a PT enhanced photograph that was  
13 taken during - on one of the affected generators in  
14 2005.

15 MEMBER ARMIJO: This is just part of a  
16 generic issue that the staff is looking into in  
17 Kewaunee?

18 MR. HISER: That is correct. Kewaunee is  
19 the first plant that has alloy 600 divider plate  
20 materials, and that's why we are pursuing it with  
21 them.

22 MR. DAILY: I think part of the concern,  
23 too, is with steam generator histories, and we had  
24 some offline discussions of over the last 30 years or  
25 so that we have been associated with, many times we

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1 have what we think is a great analysis only to find  
2 out in a couple of years that something new crops up,  
3 and nature doesn't really read our engineering  
4 reports. So we are just not sure that not being a  
5 little proactive is the right way to go.

6 CHAIRMAN BONACA: On metal fatigue, the  
7 reactor coolant pressure boundary, and applicant's use  
8 of Fatigue Pro, it's not the first time that this  
9 issue has come up, is it true?

10 MR. HISER: No, that's correct. Numerous  
11 plants have used Fatigue Pro. It is standard practice  
12 within license renewal for the applicant or licensee  
13 to update their calculations using --

14 CHAIRMAN BONACA: But I am saying that the  
15 fact that they did not incorporate portions of the  
16 stress tensor, that is not the first time it's  
17 happened.

18 MR. DAILY: That is not the first time.  
19 This is actually just the way that particular module  
20 in Fatigue Pro is designed. And that was why the  
21 staff identified this a couple of years ago, and it  
22 resulted in the issuance of a regulatory issue summary  
23 to get word out to the industry, and of course this  
24 may have been a case where documents crossed in the  
25 mail so to speak, because 2008 was the same time that

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1 Dominion was submitted.

2 CHAIRMAN BONACA: I was going to ask if it  
3 was worthwhile to have a generic communication.

4 MR. HISER: And Fatigue Pro is used by  
5 numerous plants for cycle counting, and we have no  
6 concerns with that. It's just the stress-based  
7 fatigue calculation portion.

8 MR. HOLIAN: This is Brian Holian. I just  
9 wanted to add one other thing on that steam generator  
10 divider plate. Kewaunee is just in the queue now for  
11 the issue, and the ACRS also often asks what about  
12 other plants that you have already renewed, and we do  
13 pick them up. We are in contact with the regions. We  
14 have a chance in our next inspection that Caroline and  
15 her folks go out to, and all the regions do, on 7013,  
16 to check on how they take this operating experience  
17 and put it into their aging management program that  
18 they already have for steam generators.

19 So we have that closure loop also to  
20 inspect plants on how well they do if they have  
21 already received the license.

22 I'm going to go into buried piping here in  
23 a minute, and Kewaunee is also in the loop now for the  
24 staff pushing a little harder on buried piping  
25 commitments. So nothing unusual with their program

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1 with that being an open item other than their coming  
2 through at a time when the staff and operating  
3 experience both are pushing for more inspection.

4 CHAIRMAN BONACA: Good.

5 MR. DAILY: Next slide.

6 The third open item involves as we had  
7 mentioned the applicant's aging management programs  
8 for buried and underground piping and tanks. Staff  
9 has noted a number of recent industry events involving  
10 leakage from such buried and underground piping and/or  
11 tanks, and is concerned about continued  
12 susceptibility, the failure of these particular  
13 components, again whether they were buried or  
14 underground but within the scope of license renewal.  
15 So the staff issued an RAI on May 27<sup>th</sup>, 2010,  
16 requesting that the applicant discuss the instances of  
17 leakage or adverse conditions that they have  
18 identified there at the Kewaunee Power Station and how  
19 the applicant's aging management programs have been  
20 revised in order to address any of these conditions.  
21 And we have specifically within the past five years.

22 And then secondly to discuss how the aging  
23 management programs will address these recent industry  
24 operating experience concerning aging effects in  
25 buried, underground and limited-access piping and

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1 tanks. The applicant has provided their response  
2 again July 22<sup>nd</sup>, and the staff is in the process and in  
3 a dialogue to confirm the acceptability and will make  
4 this final determination on this for the final SER.

5 The fourth open item identified some  
6 issues in the applicant's work control process  
7 program. Again, as Dominion had discussed in their  
8 presentation, on September 25<sup>th</sup>, 2009, Dominion amended  
9 its work control process program, and changed it from  
10 a plant-specific program to a new program which when  
11 enhanced would be consistent with two of the GALL  
12 reports, aging management program: The one-time  
13 inspection program and the inspection of internal  
14 surfaces and miscellaneous piping under those  
15 situations.

16 And the RAI that was issued requested the  
17 applicant to provide some explanations or  
18 justifications on some of the issues regarding not  
19 completely specifying minimum percentages or sample  
20 sizes or inspection frequencies of populations. In  
21 other words if they are all lumped together is that  
22 really the right way, or should we get different  
23 component groupings and so forth?

24 We also requested clarification on the  
25 operating experience examples that they had provided

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1 to us. Those operating experience examples actually  
2 created some uncertainties in the staff mind as to  
3 whether or not they were effectively managing it.

4 MEMBER STETKAR: Could you elaborate a bit  
5 on that? Because I asked the applicant a little bit  
6 about how they've accounted for their operating  
7 experience in the current work control process. In  
8 terms of informing the frequency of inspections or the  
9 locations of inspections or how you might organize  
10 your sampling. And I didn't get much feedback on  
11 that. So I'm going to ask you in terms of, you said  
12 it - you used the term, it's created uncertainties.  
13 How are you following up on this other than it's  
14 obviously an RAI and --

15 MR. DAILY: There are some issues like  
16 that in regard to the frequency. One of the problems  
17 in reviewing an application, of course, is you have to  
18 review what is submitted. And one of the particular  
19 examples that was cited concerned a pipe whose flow  
20 became 92 percent blocked, and it was discovered  
21 during some maintenance, and of course they corrected  
22 the corrosion blockage, and we just kind of stepped  
23 back for a second and said, but if it's 92 percent  
24 blocked how does that show a proactive program? So is  
25 this really what you wanted to say or what? We were

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1 just confused, so the applicant has agreed instead to  
2 address this under some different circumstances in  
3 order to provide the right kinds of examples.

4 MR. PELTON: Dave Pelton, branch chief  
5 responsible for the work control process or the aging  
6 management programs associated with it. Initially the  
7 program proposed by the applicant is a program I think  
8 you heard earlier that they applied at other Dominion  
9 sites. And the first issue the staff had initially  
10 was the scope of the component types that were  
11 included under the program for Kewaunee was, frankly,  
12 significantly larger than had been applied in the  
13 past.

14 MR. DAILY: It is 25 percent of all their  
15 line items.

16 MR. PELTON: In order to have assurance  
17 that their program which you heard earlier is one that  
18 is largely based on an opportunistic approach -- does  
19 anyone want to explore that beep or are we good?

20 MEMBER STETKAR: No, that is just the  
21 phone line.

22 MR. PELTON: We just wanted to have some  
23 reasonable assurance that the work control process as  
24 initially defined would cover a sufficient breadth and  
25 depth of equipment types such that over the period of

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1 extended operation if you drew a big chart you would  
2 say, hey, it seems to be a consistent distribution  
3 across component types rather than a siloed or lumped  
4 area. And we had discussions with Dominion folks and  
5 I think we were all in agreement that that is  
6 certainly something that needs to be appropriately  
7 managed.

8 Moving forward through the request for  
9 additional information process, getting more and more  
10 specific into what sampling approaches, how do we have  
11 that kind of assurance, it was Dominion who made the  
12 determination to have a shift in direction from the  
13 originally proposed program to then look at a couple  
14 of existing aging management programs in the GALL. It  
15 was not at the request, direction or otherwise of the  
16 staff.

17 MEMBER STETKAR: My apologies. (Laughter)

18 MR. PELTON: But I just want to make it  
19 clear, and we made that point clear during the public  
20 meeting, that the program is defined in the GALL  
21 report are absolutely suitable, acceptable programs,  
22 as was the program they had originally proposed. And  
23 during - just so you know, to address your earlier  
24 comment, during the public meeting we had we did  
25 address the issue of, hey, you originally proposed one

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1 program; you are sliding into a different one. The  
2 intent here was never to reduce its effectiveness or  
3 otherwise prohibit the licensee from doing what was  
4 reasonable. So moving forward, we are continuing to  
5 explore their methodology for ensuring an appropriate  
6 depth and breadth of equipment or component types. So  
7 that's basically, without getting into specifics of  
8 operating experience, which by the way was considered,  
9 that's kind of where we're at right now, and we are  
10 working towards an amicable program that would give us  
11 reasonable assurance that over 20 years it will be  
12 appropriate.

13 MEMBER STETKAR: Caroline, I don't  
14 remember all the details in the inspection report, for  
15 this particular program did you do - it's difficult to  
16 do kind of a keyword search for this type of issue.  
17 Did you specifically kind of drill down into operating  
18 experience for this one?

19 MS. TILTON: Actually we did not collect  
20 the work control process as part of our review,  
21 because that was the transition in which Dominion was  
22 going --

23 MEMBER STETKAR: Yes, I understand it was  
24 kind of a fluid situation.

25 MS. TILTON: Correct, it was going to

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1 change so we didn't collect it.

2 MEMBER STETKAR: And also, it's a little  
3 bit difficult to do keyword searches, because this is  
4 a broader scope program.

5 MR. DAILY: One of the things we are  
6 trying to do, though, to inform the discussions  
7 obviously is going back and looking at some of the  
8 history, for example, Millstone, North Anna, Surry,  
9 which are part of the Dominion fleet. They used the  
10 program there. Obviously there must have been some  
11 good things there. Are they also present here? Just  
12 to make sure like Dave was talking about that we have  
13 some reasonable assurance that just because you have  
14 100 problems with one section of surface water piping  
15 due to microbiological corrosion that doesn't mean  
16 you did 100 inspections.

17 MR. PELTON: We are trying to make sure  
18 that we don't get into that trap, and we will make  
19 sure that whatever response is ultimately agreed to,  
20 it's well founded and well based within the available  
21 operating experience for sure.

22 MR. MEDOFF: This is Jim Medoff of the  
23 staff. I was originally assigned to this review. But  
24 to elaborate on like an example of operating  
25 experiences originally provided in the original LRA

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1 where we concluded that it may not demonstrate  
2 adequate aging. We had an original OE example of  
3 where the applicant stated that they had gone back and  
4 I think it was like a turbine generator stator cooling  
5 heat exchanger, they had done some eddy current  
6 examinations of the tubes and they found some pitting  
7 through the tubes, and that this demonstrated adequate  
8 aging management. But if you looked at the program  
9 elements through their original work control process  
10 it proposed visual examinations. So one of the things  
11 I perceived was that they detected the aging using an  
12 eddy current examination, but eddy currents weren't  
13 within the scope of this program and still aren't part  
14 of the program. So that would be an example where we  
15 looked at the OE, and I was wondering why would you do  
16 eddy currents for heat exchanger tubes rather than  
17 visual examinations, because that was the technique  
18 that detected the aging effect. So there are a number  
19 of OE examples that they had given where we had other  
20 - whether their handling of the OE or their  
21 determinations would demonstrate adequate aging  
22 management.

23 MEMBER STETKAR: It sounds like this is  
24 still a bit in the evolving stage.

25 MR. DAILY: Correct. We are working on

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1 it, yes.

2 MEMBER STETKAR: We're working on it?

3 Okay, good.

4 MR. DAILY: Was there another question?

5 Next slide.

6 As a part of LRA Section 3.5, the  
7 applicant supplied data regarding the aging management  
8 of in scope but inaccessible concrete that was below  
9 grade. We also discussed this in the safety  
10 evaluation report. And what we are showing here is -  
11 are the data that was supplied to us during the  
12 license renewal application, specifically looking at  
13 whether or not soil is aggressive in the area of the  
14 related concrete structures, with the pH readings.  
15 And of note are the chloride readings which the limit  
16 is 500 and there were readings in the 2007-2009  
17 timeframe of 1,240 ppm at some of the wells, and in  
18 addition the sulfates were as noted.

19 So to make a long story short in this area  
20 because again Dominion did discuss it, the applicant  
21 has committed to taking additional coring samples both  
22 prior to - core samples in the concrete wall and  
23 foundation areas in the vicinity of the high chlorides  
24 in order to make sure that there is no possible  
25 degradation. If those chloride levels do not decrease

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1 to below the 500 ppm within the first 10 years of a  
2 period of extended operations, then the applicant is  
3 committed also to perform those core samples again in  
4 order to examine and look for any aggressive attacks  
5 due to chlorides in the concrete or the rebar.

6 Staff also wanted to note that the  
7 applicant's structures monitoring program also  
8 contains a provision to sample groundwater chemistry  
9 at least once every five years, and of course if their  
10 groundwater program they're sampling as indicated.

11 Next slide. Regarding SER Section 4 which  
12 is the time limited aging analysis, particular note in  
13 Section 4.23 the pressurized thermal shock section, we  
14 have this highlight here to discuss the PTS limits for  
15 reactor vessel material due to neutron embrittlement.

16 The limiting components with respect to the projected  
17 PTS values at the end of 60 calendar years were 52.1  
18 EFPY are as indicated here on the slide. These are  
19 the top three components or locations with regard to  
20 how close they are to their limiting values, and the  
21 closest one of course is the top value which is the  
22 intermediate shell to lower shell girth weld. The  
23 limit of course is less than or equal to 300 degrees  
24 Fahrenheit, and the calculated value is 297.5. This  
25 calculated value was determined using a methodology

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1 that was approved by the staff safety evaluation data  
2 back in May of 2001, and it was presented as an  
3 exemption to 10 CFR 50.61 as well as a couple of  
4 others we didn't note on the slide.

5 MEMBER ARMIJO: What would that value be  
6 if the new PTS methodology was used? I'm just  
7 assuming this is not using the new methodology?

8 MR. DAILY: I believe we actually have our  
9 staff member who has conducted the review and  
10 analysis.

11 MR. CHANG: My name is Simon Chang. I'm  
12 with the DCI. If they use the newly approved PTS  
13 rule, I think basically they are in a much better  
14 position. Because a study was performed probably  
15 several years ago and published in NUREG 1874. And in  
16 that study, the new rule has like a six screen  
17 criteria as opposed to the old one. The old rule, the  
18 current rule we have only two screening criteria. One  
19 is 300 degrees. One is 270. And by the new screen  
20 criteria which is relevant to the sequential world of  
21 Kewaunee, actually is the 312, the new screening  
22 criteria. And based on that results technical  
23 results, issued in the NUREG 1874 for Kewaunee, and  
24 their - they use - they do not calculate their RTPTS.  
25 They calculate the RTPTS in the subunit in a

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1 different way, and they call it RT maxima CW,  
2 something like that. But based on that calculation,  
3 the Kewaunee numbers are something like 258, so far  
4 below 312. So and along with the methodology our  
5 evaluation of the methodology approved in year 2001,  
6 we are comfortable that the event is close to 300,  
7 with 297.5, we are confident that it is okay.

8 MEMBER ARMIJO: So it has actually got  
9 more margin than you would indicate based on this?

10 MR. CHANG: That's right, based on the  
11 newly approved PTS rule.

12 MEMBER ARMIJO: Okay, thank you.

13 MR. DAILY: Thank you, Simon.

14 So the staff's conclusion on this, just to  
15 cut to the bottom line on PTS, was that the applicant  
16 has satisfactorily demonstrated that for pressurized  
17 thermal shock the analyses have been projected to the  
18 end of the period of extended operations,  
19 appropriately pursuant to the rule 10 CFR 54.21  
20 (c)(1)(ii).

21 MEMBER SHACK: But this presumably is for  
22 their availability, and now power uprate? No new  
23 power uprates?

24 MR. DAILY: I would project that any new  
25 power uprates would obviously have to revisit this.

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1 MEMBER SHACK: I mean it didn't include  
2 anything in here, any margin to include a power  
3 uprate?

4 MR. DAILY: No, not that I'm aware of in  
5 the future, no future I'm seeing from Dominion.

6 MEMBER STETKAR: It looks like they  
7 projected about 87 percent availability, 52.1 over --

8 MR. DAILY: That is based on the  
9 historical amount of availability they actually  
10 exposed the FQI, and they added on a 95 percent cycle  
11 I believe 27 going forward.

12 MEMBER STETKAR: But it is an average 87  
13 percent.

14 MR. DAILY: Over the entire 60 years that  
15 would be an average. Next slide.

16 So in conclusion, and pending successful  
17 resolution of all these open items, the staff  
18 determines that the requirements of 10 CFR 54.29(a)  
19 has been met for the license renewal of Kewaunee Power  
20 Station.

21 This concludes our formal presentation.  
22 Of course if there are other questions we could  
23 discuss them now.

24 CHAIRMAN BONACA: Thank you.

25 MEMBER STETKAR: I have one. It's nothing

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1 that has been discussed by either the applicant or the  
2 staff. The subject is small bore socket welds. And I  
3 guess my question is a question of consistency in the  
4 staff's approach to an acceptable program, because if  
5 I read Kewaunee's commitment, there is a commitment  
6 number 43. It says five volumetric examinations of  
7 ASME Class I small bore socket welds will be performed  
8 using a qualified nuclear industry inspection  
9 methodology that can detect and size discontinuities  
10 within a specific examination volume if a qualified  
11 methodology becomes available.

12 One destructive examination will be  
13 performed in lieu of this inspection in the event that  
14 a qualified inspection methodology is not available  
15 prior to the period of extended operations.

16 So essentially they've said unless we have  
17 an accepted qualified volumetric examination  
18 methodology we are going to select one weld out of a  
19 population of I think 320 and do a destruction  
20 examination of that weld and that's good enough. The  
21 staff seems not to have accepted that approach for  
22 other very recent contemporary license renewal  
23 applications, essentially saying that, well, although  
24 there is no qualified methodologies, there are other  
25 methodologies in practice, and other applicants have

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1 indeed been -- let me just say other applicants have  
2 agreed to use a sampling methodology of some number of  
3 welds for volumetric examination.

4 So this approval seems to be different.  
5 We've gone from historical acceptance of visual  
6 inspections to an emphasis on a sampling for  
7 volumetric examinations to acceptance of a single  
8 destructive examination of one weld as being  
9 acceptable. So I'm concerned now about consistency,  
10 where we are now among the fleet that is coming before  
11 us.

12 MR. HOLIAN: Let me just, this is Brian  
13 Holian, and then I'll turn this socket weld to Alan,  
14 but the question and the concern is very good. I was  
15 going to add one more item to this discussion at the  
16 end, low voltage cable, which is not even in your SER,  
17 and it's one that you might see another commitment  
18 from this utility by the time they get to the final  
19 SER. And it's an evolving issue in GALL where we are  
20 pushing low voltage cable.

21 MEMBER STETKAR: This is low voltage  
22 cable?

23 MR. HOLIAN: So this is low voltage cable.  
24 So in truth in advertising I wanted to bring that up  
25 at the end, and that kind of relates to consistency

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1 issues. But as the GALL grows we get smarter. We  
2 find new operating experience we apply, things like  
3 that. So I wanted to address that. And I previously  
4 mentioned that we don't forget those things. We come  
5 back in inspection space to pick them up on previous  
6 plants to make sure that they are learning from the  
7 operating experience for the license renewal reviews  
8 of later plants.

9 On socket welds I'll let Dr. Hiser address  
10 that, but in general this issue is also one that as  
11 you know we've evolved to wanting more, and we believe  
12 the operating experience and the ability of the plants  
13 to do more, you are catching some wording that is a  
14 little bit awkward, I'll admit, but let me have Dr.  
15 Hiser address this.

16 MR. HISER: Yes, you are right on target  
17 that this is - what we are trying to do is focus  
18 things down a little bit, so that we have a common  
19 approach with all the plants. What we have been told  
20 repeatedly by the industry is there are no qualified  
21 techniques. There is no non-destructive technique  
22 that can detect and size cracks. What we have seen at  
23 the EPRI developed for one applicant was a very good  
24 phased-array approach that we are told will be shared  
25 with the rest of the industry. Our expectation is

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1 that the question of having a technique that can  
2 detect cracks, not necessarily size but at least  
3 detect cracks, should be at the window. So  
4 commitments such as this, the destructive backstop if  
5 you will, should not come into play. I mean our  
6 expectation is that there now is a technique that all  
7 plants should be able to use. So we will be pursuing  
8 this with Kewaunee and others. We may want to have  
9 them tweak that commitment somewhat.

10 MEMBER STETKAR: As I read the commitment  
11 Kewaunee basically - their period of extended  
12 operation will start in 2-1/2 years, something like  
13 that, they are committing to do a destructive  
14 examination of one weld. Bill, you are a materials  
15 guy, I'm not sure what an examination of one weld out  
16 of a large population.

17 MR. HISER: My expectation is they are not  
18 going to be doing the one. They will be doing  
19 periodic UT is my --

20 MEMBER STETKAR: Well, the commitment  
21 doesn't say that.

22 MR. DAILY: That is why this is a SER with  
23 open items.

24 MEMBER STETKAR: There is an open item on  
25 this.

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1           MEMBER SHACK:   The difference between 42  
2           and 43, 42 calls for period inspections of small bore  
3           pipes, and 43 just says volumetric inspection, it  
4           doesn't say anything about periodic you know, the  
5           prior one says that you will do it during each 10-year  
6           ISI, this one as the commitment is, I read it as a  
7           one-time five volumetric shot.   And so there is  
8           actually quite a difference between the small bore  
9           commitment and the socket weld commitment.

10           MR. HISER:    I think I misspoke, because  
11           for small bore socket welds, this is a one time  
12           inspection.   There are some plants that have had a  
13           history of failures with socket welds, and there it  
14           becomes more of a periodic program.

15           This information is just within the last  
16           couple of months, at the EPRI Center.

17           MEMBER ARMIJO:  It is the staff's intent,  
18           though, to really get at least a detection capability,  
19           a nondestructive detection capability.   And if you  
20           want to pursue a destructive exam to get an idea of  
21           size, that is something else.   But just to do  
22           destructive exams without any guidance that there  
23           might be a crack there, that's kind of a waste of  
24           time.

25           MR. FU:        This is Bart Fu.   I'm the

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1 reviewer of the license renewal. It is not really the  
2 staff's intent to destructively examine. It is only  
3 as an alternative. If they haven't had an  
4 opportunity. That's why we call it opportunistic  
5 destructive examination. If we --

6 MEMBER ARMIJO: If you were going to cut  
7 it out anyway.

8 MR. FU: If they do a plant modification.  
9 Say they have a section of the line, just cut it out,  
10 and then you know we will have an opportunity to take  
11 a look at the socket welds. And when we talk about  
12 one examination, one destructive examination, that  
13 could be also a weld in a section of the line.

14 And also understand this is out of a  
15 series of discussions between the staff and the  
16 applicant, I believe back from this time last year  
17 until January timeframe this year. And the staff  
18 learned and knows a lot more now than at that time.  
19 And since then I believe Dr. Hiser mentioned EPRI has  
20 qualified the program for socket welds.

21 MR. HISER: I would be careful. One of  
22 the words I hate is qualified. And actually the  
23 wording I liked is demonstrated capable of detecting  
24 degradation at interest. Because from a license  
25 renewal perspective, we want to know is the aging

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1 going on. We want to be able to detect it from a  
2 license renewal perspective. I don't care if you can  
3 size it. Because if you find it, then you are going  
4 to have to figure out what to do with it. And that is  
5 where sizing comes into play.

6 MEMBER ARMIJO: I totally agree with that.

7 MR. HISER: So what EPRI has demonstrated  
8 is the capability of detecting cracks. And that is  
9 exactly what the staff has been looking at . I think  
10 we have gotten bollixed up with the industry on the  
11 word, qualified. So we - the staff has tried to pull  
12 away from qualified, and just go to demonstrate  
13 capable of detecting.

14 MEMBER STETKAR: That is the type of  
15 commitments that I have seen in other - those sorts of  
16 words - in other license renewal applications.

17 MR. HISER: I think Bart is correct that  
18 we have resolved this with this commitment many months  
19 ago. And I from my perspective I didn't realize that  
20 we still had this type of commitment for Kewaunee. We  
21 need to go back and relook at that.

22 MEMBER STETKAR: I think a little bit of  
23 our concern is we, as you well know, we have a  
24 constant stream of these things coming through us, and  
25 our relative attention on how to think about this

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1 issue needs a bit of recalibrating every now and then.

2 MR. HOLIAN: This is Brian Holian. Your  
3 question is very good on these commitments, and we are  
4 doing that, even on the period piping. On the 14  
5 plants that we have in house you are going to see some  
6 variations in the commitments, but they are well above  
7 the one buried piping that we had several years ago 10  
8 years prior, which they should be. But you are  
9 getting some variances until we get that new GALL out  
10 in December.

11 MEMBER SHACK: Notice nobody said guided  
12 waves for buried piping in this application. And we  
13 thank you for that.

14 MR. HOLIAN: That is right. So we are  
15 still working that, and we will take this comment.

16 MR. DAILY: These are definitely moving  
17 issues and evolving, and I think it's a point well  
18 taken that the staff is trying to converge everything  
19 so that there is some consistency and predictability  
20 and usefulness.

21 MEMBER STETKAR: It is also, there is a  
22 message for your people coming in.

23 MR. FU: I would like to respond to the  
24 consistency issue. Kewaunee, we reviewed the plant  
25 operating experience. In their experience, you may

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1 recall the few reviews we did with Wayne Arnold and  
2 Cooper when they had experienced tracking, especially  
3 at Wayne Arnold, they had pretty bad SSC, we're  
4 talking about bad chemistry.

5 MEMBER SHACK: These guys have never had a  
6 socket weld fail?

7 MR. FU: Not class one small bore socket  
8 weld; that's in the application, they make that  
9 statement.

10 MR. AITKEN: This is Paul Aitken. We  
11 don't have any reported failures of Class I sockets.  
12 And we don't have the OE. And Dr. Hiser mentioned the  
13 technology. I think there has been some success at  
14 EPRI. I know there is a project to be evaluated for  
15 further funding that is going to be discussed in the  
16 next couple of weeks, but I think that was for a  
17 specific configuration, and they would have to expand  
18 that scope to include bigger and more techniques and  
19 things like that. So they are some advancements. We  
20 are very much in touch with that. And it is our  
21 intent to meet the spirit of this commitment to do the  
22 necessary volumetric exam.

23 MR. DAILY: And clearly the lead tests or  
24 the visual tests already shows a failure that is not  
25 detecting ahead of time and that is not what we're

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1 about.

2 CHAIRMAN BONACA: Any other questions? For  
3 the presenters?

4 If not, I want to thank you very much for  
5 your great presentation and the licensee too, and I  
6 would like to go around the table and get some  
7 feedback from the members regarding two issues. One  
8 is, do we need a interim letter, and two, what your  
9 views about the significant issues here. And I'll  
10 start with you, Charley.

11 MEMBER BROWN: I don't have any additional  
12 issues. I would not - based on what I've heard I  
13 wouldn't go down the interim letter path. But  
14 somebody else might have a different perspective.

15 CHAIRMAN BONACA: Okay, Bill.

16 MEMBER SHACK: Yes, I don't see any - to  
17 me the most confusing issue is the work process  
18 control one, and everybody seems to be working that  
19 one. I'm not sure we'd add anything to it by adding a  
20 letter, but we will be looking at that when it comes  
21 time for the final SER.

22 CHAIRMAN BONACA: In my mind I was  
23 thinking of the three air dryers. Is there something  
24 that we have to communicate? I think we did already,  
25 but anyway that is the example. John.

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1 MEMBER STETKAR: I don't have anything to  
2 add. I agree with Bill. I think that --

3 CHAIRMAN BONACA: No interim letter?

4 MEMBER STETKAR: No interim letter  
5 necessary.

6 MEMBER ARMIJO: I agree. I don't think  
7 there is need for an interim letter. I think the  
8 presentations were very helpful, I think from both the  
9 staff and the applicant. I think the open items are  
10 things that will get closed - there is a clear path to  
11 get those things closed. I think they are on the  
12 right track. I don't see a problem.

13 CHAIRMAN BONACA: John.

14 CONSULTANT BARTON: Resolve the open  
15 items, that's all I see in this plan.

16 CHAIRMAN BONACA: The licensee should note  
17 that.

18 Okay, so that is the feedback and I will  
19 report to the board, to the committee, in two weeks in  
20 the full meeting, it will be a brief update anyway.

21 And with that then the meeting is  
22 adjourned.

23 (Whereupon at 11:52 a.m. the proceeding in  
24 the above-entitled matter was adjourned)

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# **Kewaunee Power Station**

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## **Presentation to Advisory Committee on Reactor Safeguards - License Renewal Subcommittee**

August 18, 2010

# Participants

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- Steve Scace – Site Vice-President
- Alan Price – Engineering Vice-President
- Michael Wilson – Station Safety & Licensing Director
- Stew Yuen – Engineering Director
- Paul Aitken – License Renewal Project Manager
- LR Project Team Members
- Station Staff

# Presentation Outline

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- Background
- Operating Information
- License Renewal Application
- Aging Management Programs
- Commitments / Implementation
- Technical Items of interest
- SER Open Items

# Background

---

## Site Description

- ◇ Located in Kewaunee County, Wisconsin
- ◇ Once-through cooling from Lake Michigan
- ◇ 2-Loop Pressurized Water Reactor
- ◇ Westinghouse Electric Corporation (NSSS), Pioneer Service and Engineering Co. (A/E)
- ◇ Turbine / Generator – Westinghouse
- ◇ 1772 MWt
- ◇ Steel Containment Vessel with Concrete Shield Building

# Background



# Background

---

## Plant History - Licensing

- Construction permit August 6, 1968
- Operating license December 21, 1973
- Commercial operation June 16, 1974
- Uprated Power License
  - ◇ MUR (1.4%, 23 MWt) July 2003
  - ◇ Stretch uprate (6%, 99 MWt) February 2004
- Plant Owner change to Dominion July 2005
- Operating License expires December 21, 2013

# Operating Information

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## Current Plant Status

- ◇ Operating Cycle 31
- ◇ 100% Power
- ◇ 301 Days On-line
- ◇ 1268 Days since Last Automatic Trip
- ◇ Next refueling outage: February 2011



# Operating Information

---

## Major Improvements

- Replaced Main Condenser Tubes 1985
- Replaced Feedwater Heater Tubes 1992
- Replaced the Plant Process Computer (twice) 1993 / 2005
- Steam Generator Replacement 2001 [{pic}](#)
- Replaced Component Cooling Pumps 2001
- Replaced Upper Internals Split Pins 2004
- Replaced Reactor Vessel Head 2004



# Operating Information

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## Major Improvements

- Replaced Reactor Coolant Pump Internals 2003 / 2008
- Constructed ISFSI 2009
- Replaced Service Water Pumps 2009
- Improved Tech Specs Draft SER Issued 2010
- Switchyard Improvements On-going [{pic}](#)
- Transformer Replacements On-going

# License Renewal Application

---

- License Renewal Project Overview
  - ◇ Diverse project team members (Site, Corporate, Contract)
  - ◇ Experience with Surry, North Anna, and Millstone LRAs
  - ◇ Site involvement in IPA and AMP development
  - ◇ Participation in NEI LR industry working groups
  - ◇ Involved with GALL Updates (Rev. 0 & Rev. 1)

# License Renewal Application

---

- LRA Development
  - ◇ Scoping and Screening
    - Consistent with 10CFR Part 54 and NEI 95-10
    - Utilized site component databases, controlled drawings, design and licensing documents
    - In-scope structures, components and commodities were screened to determine if AMR was required
  - ◇ Aging Management Review
    - Consistent with 10CFR Part 54 and NEI 95-10
    - Utilized industry aging reports and plant-specific OE
    - Results showed good consistency with GALL Report (Rev. 1)

# License Renewal Application

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- LRA Development
  - ◇ Time-Limited Aging Analyses
    - Reactor vessel neutron embrittlement
    - Metal fatigue and thermal cycle limit assumptions
    - Environmental qualification of electrical equipment
    - Metal containment and penetrations fatigue
    - Misc TLAAs
      - Crane load cycle limit
      - Reactor coolant loop leak-before-break
      - Reactor vessel underclad cracking
      - RCP motor flywheel crack growth

# Aging Management Programs

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- 34 total
  - ◇ 28 - Existing programs (1 plant-specific)
  - ◇ 6 - New programs
- GALL Consistency – Programs showed good consistency with model AMPs in GALL

# Commitments / Implementation

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- Commitments were documented in the LRA and modified as needed during NRC review
  - ◇ 45 License Renewal Commitments
    - 28 original
    - 19 added
    - 2 deleted

## Commitments / Implementation

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- LR commitments have been entered into the Licensing Commitment Tracking System
- Implementation of commitments is in progress and will be completed on the schedule provided in the LRA or sooner
- Leveraging fleet knowledge and experience
- Dominion participating in NEI-LR Implementation Working Group
- Benchmarking others in the industry

# Technical Items of Interest

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- Groundwater Quality
- Historical Reactor Trip Transients

# Technical Items of Interest

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- Groundwater Quality
  - ◇ Elevated groundwater chloride concentrations were indicated near in-scope structures based on monitoring well sample readings [{pic}](#)
  - ◇ Readings were marginally over 500 ppm limit
  - ◇ Elevated readings attributed to de-icing methods – use of road salt
  - ◇ Changed de-icing practice to incorporate sand mix to reduce total chloride deposited on ground

# Technical Items of Interest

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- Groundwater Quality
  - ◇ No significant effect on structure based on:
    - Below grade concrete protected by waterproofing membrane
    - Minimal potential for exposure of concrete due to low groundwater elevations
    - Low permeability concrete – only minor in-leakage noted during 36 years in service
  - ◇ Core removal and testing planned for confirmation
  - ◇ Additional coring in 10 years if Cl<sup>-</sup> readings do not decrease <500 ppm

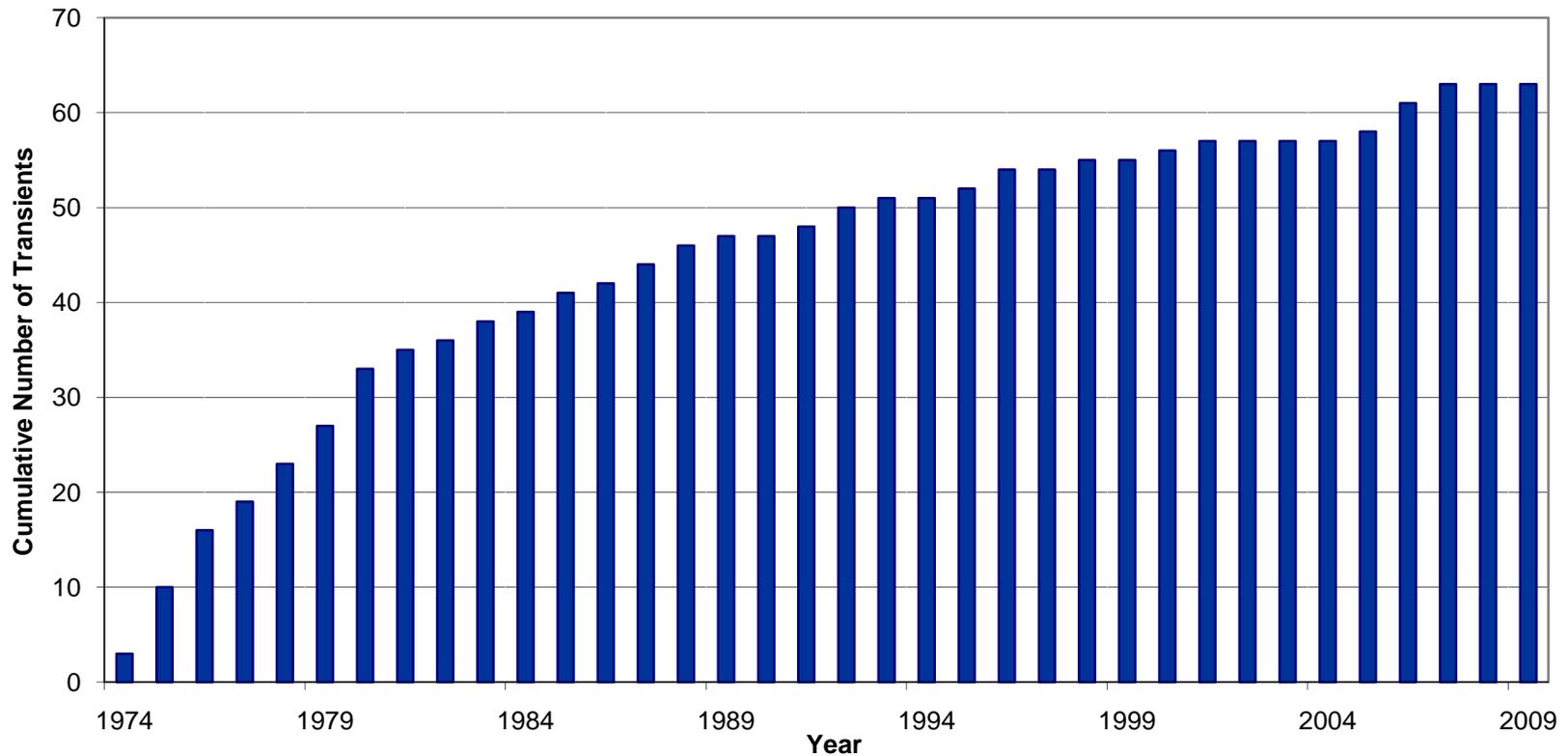
# Technical Items of Interest

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- Historical Reactor Trips
  - ◇ Rate of occurrence of reactor trips reduced since initial operations
  - ◇ Reactor trips have been recorded since plant initial startup
  - ◇ Reactor trips are monitored as a transient for fatigue cycle counting purposes

# Technical Items of Interest

## Reactor Trip



# SER Open Items

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## 4 Open Items (OI)

- OI 3.0.3.2.20-1    Use of FatiguePro Software
- OI B2.1.32-1        Work Control Process Program
- OI 3.1.2.1.7-1      S/G Divider Plate Cracking due to PWSCC
- OI 3.0.3.2.4-1      Recent Operating Experience for Buried  
and Underground Piping and Tanks

# SER Open Items

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## **OI 3.0.3.2.20-1: Use of FatiguePro Software**

- Initial evaluation of environmental effects on fatigue life utilized EPRI FatiguePro stress-based fatigue (SBF) monitoring for 2 locations
- RIS 2008-30 identified potential for non-conservatism when FatiguePro SBF applied – RAI B3.2-2 issued
- LR Commitment 41 established to re-evaluate these locations using ASME Code, Section III, NB-3200 compliant methods
- Acceptable 60-year fatigue life results were obtained and a summary report submitted in response to RAI B3.2-2 to support closure of Commitment 41

# SER Open Items

---

## **OI B2.1.32-1: Work Control Process Program**

- Work Control Process program revised following initial submittal in response to NRC concerns
- WCP (as revised) is a new program that is consistent with –
  - ◇ NUREG-1801, M32: One-Time Inspection
  - ◇ NUREG-1801, M38: Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components

# SER Open Items

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## OI B2.1.32-1 (cont'd)

- NRC requested additional clarifications for:
  - ◇ Selection of one-time inspection sample sizes and schedule for completion of inspections
  - ◇ Minimum sample size for periodic inspections and inspection frequencies for inspections of internal surfaces
  - ◇ Capability to detect aging effects, based on OE examples submitted
  - ◇ Clarification of the commitment to implement the WCP program

# SER Open Items

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## OI B2.1.32-1 (cont'd)

- Additional information provided to address NRC request:
  - ◇ M32: Clarified the methodology used to determine one-time inspection sample size
  - ◇ M38: Clarified that periodic inspections are based on planned surveillance and maintenance activities, and not predetermined sample size; and that inspections are expected to be performed multiple times due to periodic nature of program.
  - ◇ New Commitment 47 established to provide relevant OE within 2 years after implementation of WCP
  - ◇ Clarified that the WCP AMP is a new AMP and that one-time inspections will be completed prior to period of extended operation
- A response to RAI B2.1.32-1 has been provided to address this Open Item

# SER Open Items

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## **OI 3.1.2.1.7-1: S/G Divider Plate Cracking due to PWSCC**

- RAI 3.1.2.2.13-1 requested:
  - ◇ identification of materials of construction for SG divider plate assembly
  - ◇ evaluation of the potential for PWSCC cracks to propagate to base materials or cladding, and provide an inspection program if required.
- Request was based on recent foreign operating experience with SG divider plate cracking

# SER Open Items

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## OI 3.1.2.1.7-1 (cont'd)

- EPRI Steam Generator Task Force evaluating concern for generic industry action
- Kewaunee monitors and evaluates industry (foreign and domestic) operating experience, including steam generator OE
- Kewaunee SGs replaced in 2001, limited service life for cracking
- Crack propagation into base materials or cladding limited by:
  - ◇ Kewaunee divider plate assembly welds are Alloy 52/152 (PWSCC resistant)
  - ◇ Industry experience indicates that PWSCC cracking stops when non-susceptible materials are encountered (i.e., SS, LAS, Alloy 52/152)
  - ◇ No domestic or foreign OE related to crack propagation into base materials
- A response to RAI 3.1.2.2.13-1 has been provided to address this Open Item

# SER Open Items

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## OI 3.0.3.2.4-1: Recent OE for Buried and Underground Piping and Tanks

- RAI B2.1.7-3 requested:
  - ◇ Identification of buried and underground components addressed by the Buried Piping and Tanks Inspection and the External Surfaces Monitoring programs;
  - ◇ Identification of updates to these programs to incorporate lessons learned from recent events related to buried piping leakage

# SER Open Items

---

## OI 3.0.3.2.4-1 (cont'd)

- Buried piping and tanks, and planned inspections

<u>System</u>	<u>Prior to PEO</u>	<u>During 1<sup>st</sup> 10 Yrs of PEO</u>
CW piping (15'/200')	Two*	Two*
DG FO piping (500')	One	One
DG FOST (3)	One tank	One tank
FP piping (2350')	Three	Three

\*One for stainless steel piping and one for carbon steel piping

# SER Open Items

---

## OI 3.0.3.2.4-1 (cont'd)

- Industry Operating Experience
  - ◇ NEI NSIAC buried piping initiative adopted by Kewaunee
  - ◇ Kewaunee evaluates industry operating experience for buried piping program enhancements
  - ◇ A site program owner is assigned responsibility for implementation of the buried piping program
  - ◇ Dominion actively participates as a member of EPRI Buried Piping Integrity Group
- A response to RAI B2.1.7-3 has been provided to address this Open Item

# Kewaunee License Renewal

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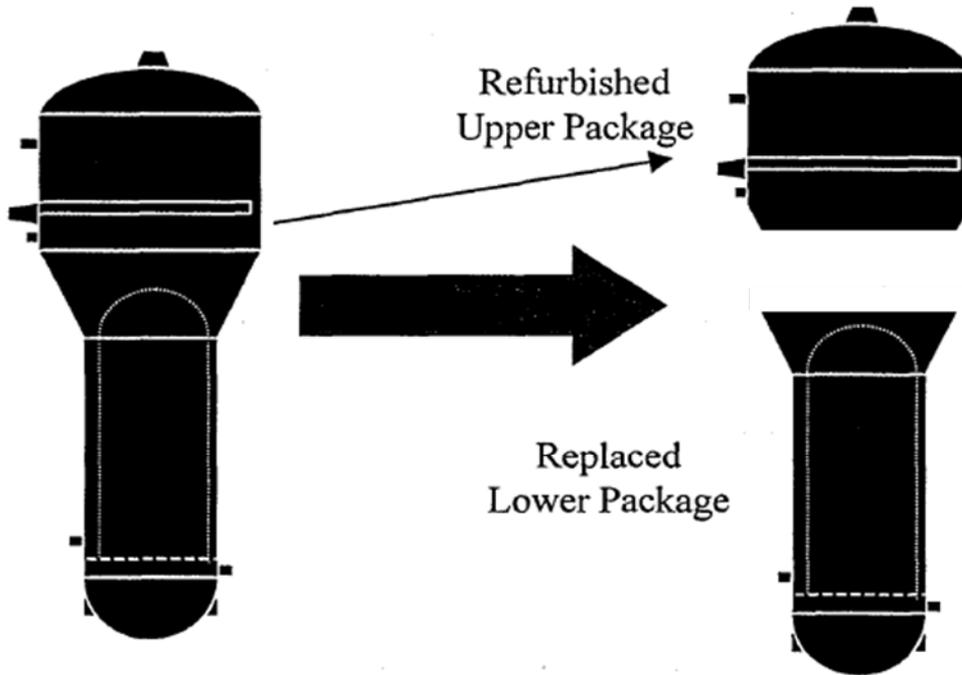
Questions



# Kewaunee License Renewal

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Additional Slides



**Original SG  
Model 51**

**Replacement SG  
Model 54F**

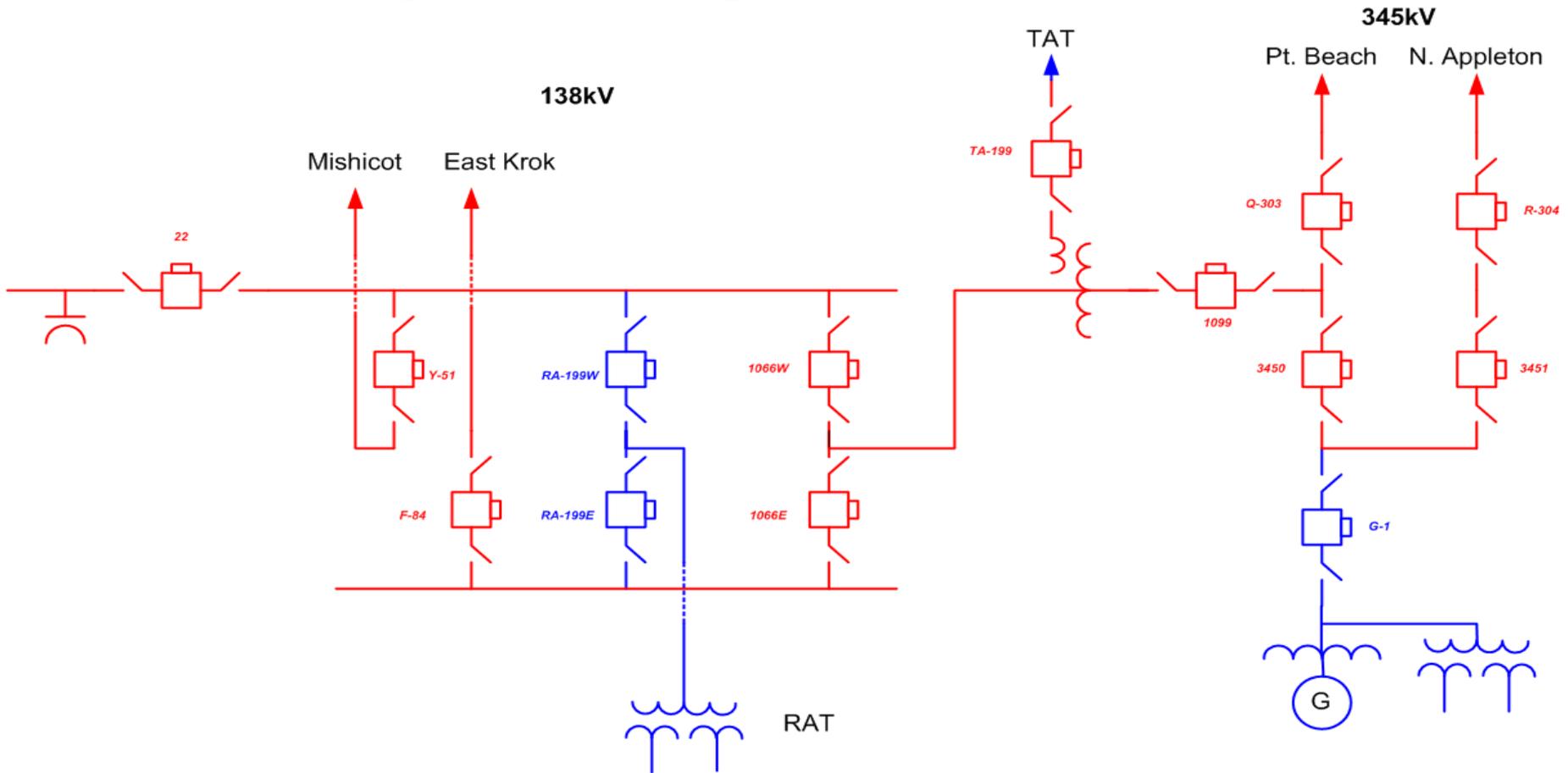
## Key Improvements

Steam Flow Limiter  
Separator Mods  
Feedwater Ring

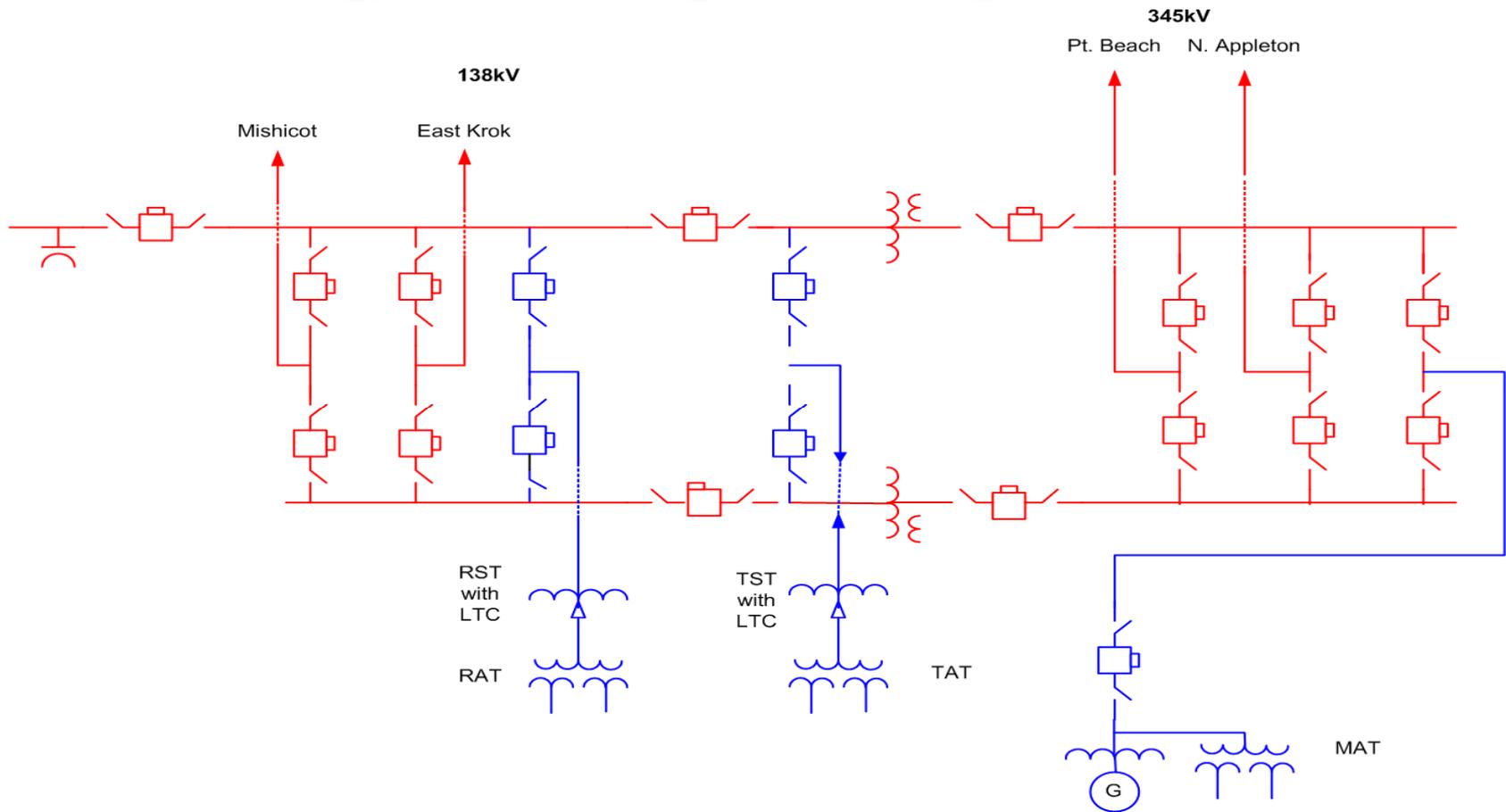
Alloy 690 Tubes  
Stainless Support Plates  
Alloy 600 Divider Plate with  
52/152 weld material

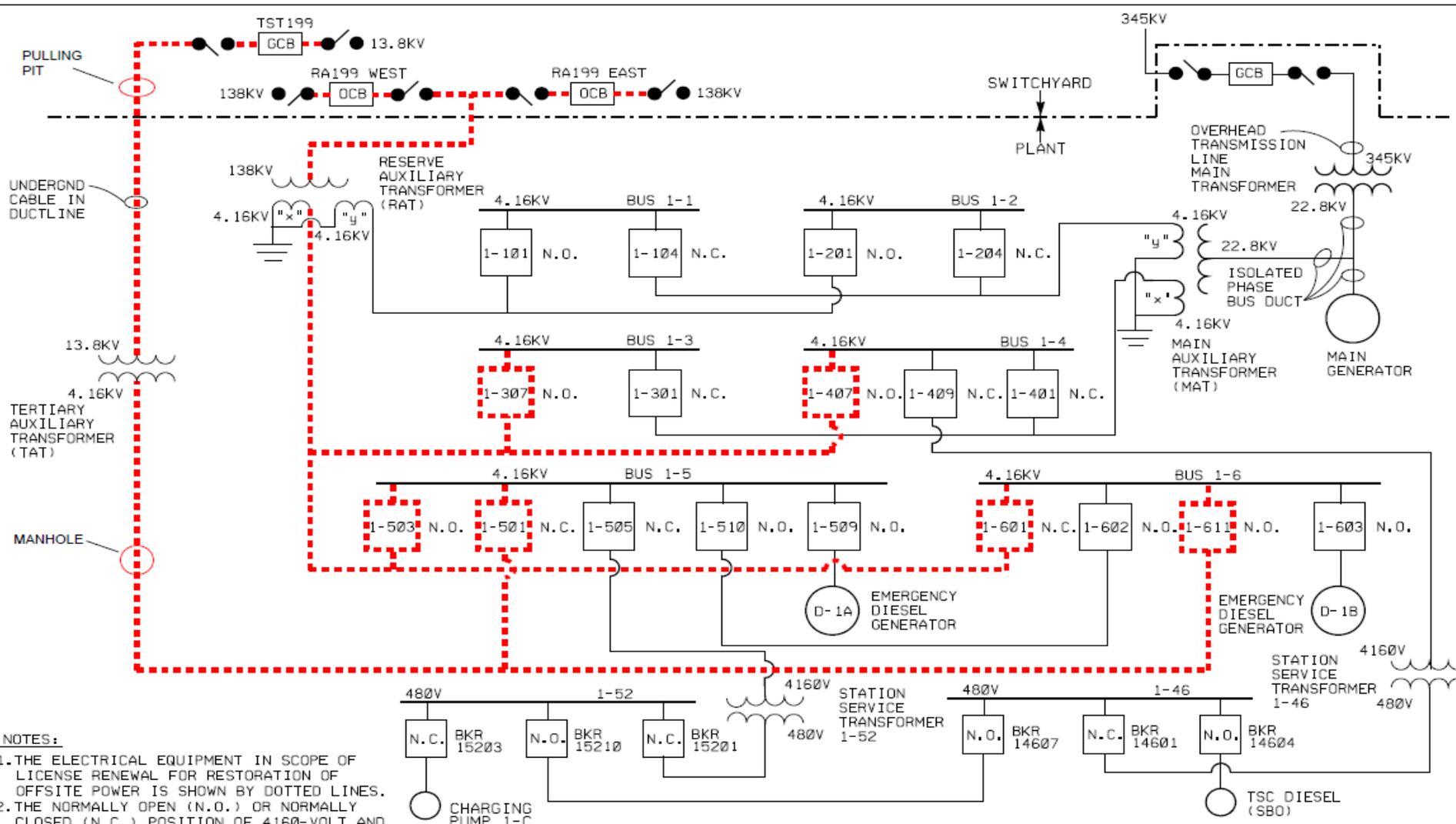
Not Unique to KPS  
Similar Replacements  
Performed for Surry ('80  
& '81) and North Anna  
( '93 & '95) + others.

# Switchyard Layout in 2006

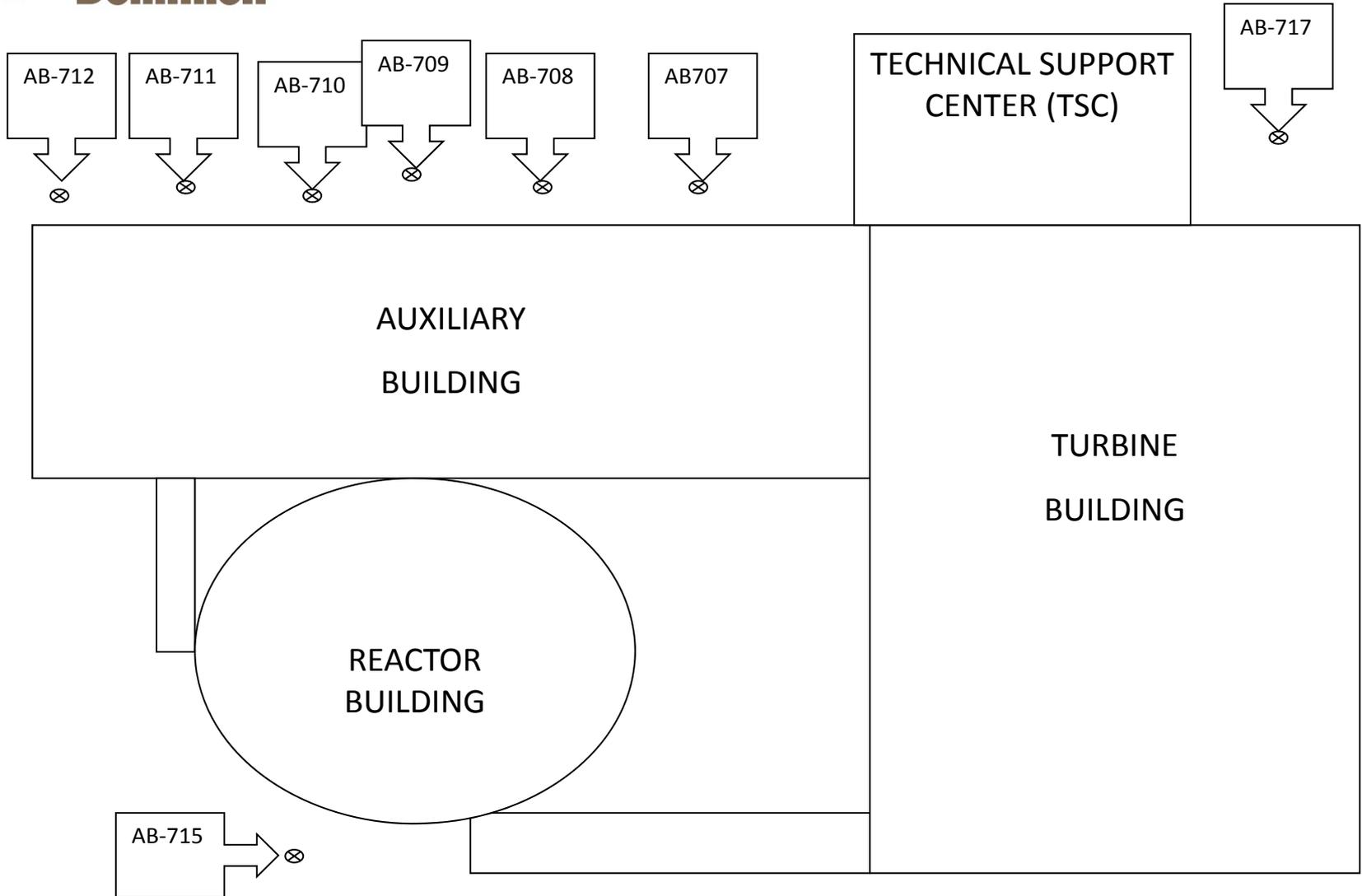


# Switchyard Layout by 2011





- NOTES:**
1. THE ELECTRICAL EQUIPMENT IN SCOPE OF LICENSE RENEWAL FOR RESTORATION OF OFFSITE POWER IS SHOWN BY DOTTED LINES.
  2. THE NORMALLY OPEN (N.O.) OR NORMALLY CLOSED (N.C.) POSITION OF 4160-VOLT AND 480-VOLT BREAKERS ARE INDICATED FOR NORMAL PLANT OPERATION.





**Advisory Committee on Reactor Safeguards (ACRS)  
License Renewal Subcommittee  
Kewaunee Power Station (KPS)  
Safety Evaluation Report (SER)  
with Open Items  
August 18, 2010**

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

# Presentation Outline

- Overview of KPS license renewal review
- SER Section 2, Scoping and Screening review
- The Region III License Renewal Inspection
- SER Section 3, Aging Management Programs and AMR results, with Open Items
- SER Section 4, Time-Limited Aging Analyses (TLAAs)

# Overview (LRA)

- License Renewal Application (LRA) submitted August 12, 2008
  - Applicant: Dominion Energy Kewaunee, Inc. (DEK)
  - KPS located in Kewaunee county, Wisconsin
  - Westinghouse 2-loop PWR Design
  - 1772 MWt, 590 MWe
  - Facility Operating License No. DPR-43 expires December 21, 2013

# Audits and Inspections

- **Scoping and Screening Methodology Audit**
  - March 10 – 13, 2009
- **Aging Management Program (AMP) Audits**
  - June 9 – 12, 2009
  - October 19 – 20, 2009 (Audit of the revised Work Control Process AMP)
- **Region III Inspection (Scoping and Screening & AMPs)**
  - August – September 2009

# Overview (SER)

- Safety Evaluation Report (SER) with Open Items issued July 16, 2010
- SER contains 4 Open Items (OIs):
  - Use Of FatiguePro™ Software in Metal Fatigue Calculations (OI 3.0.3.2.20-1)
  - Ni-Alloy Steam Generator Divider Plate Cracking due to PWSCC (OI 3.1.2.1.7-1)
  - Incorporating recent operating experience for buried and underground piping and tanks (OI 3.0.3.2.4-1)
  - Work Control Process Program Issues (OI B2.1.32-1)

# SER Section 2 Summary

## Structures and Components Subject to Aging Management Review

- Section 2.1, Scoping and Screening Methodology
  - Methodology is consistent with requirements of 10 CFR 54.4 and 54.21
- Section 2.2, Plant-Level Scoping Results
  - Systems and structures within the scope of license renewal are appropriately identified in accordance with 10 CFR 54.4
- Sections 2.3, 2.4, 2.5 Scoping and Screening Results
  - SSCs within the scope of license renewal are appropriately identified in accordance with 10 CFR 54.4(a), and those subject to an AMR in accordance with 10 CFR 54.21(a)(1)



# **Kewaunee Power Station License Renewal Inspection**

**Caroline Tilton  
RIII Inspection Team Lead**

# Regional Inspection

- **IP 71002**
  - 2 weeks: Aug 17 – 21 & Aug 31 - Sep 4, 2009
  - 5 inspectors and 1 observer
  - Scoping & Screening
  - Aging Management Programs

# Inspection Results

- Visual Observation of Plant Equipment
  - Walkdown of portions of 10 systems
- Scoping & Screening
  - Walkdowns of selected systems
  - Drawings had adequate division between safety and non-safety
  - Non-Safety Affecting Safety was Acceptable
- AMPs – Team reviewed a sampling of 24/34 AMPs
  - Program Documents & Procedures
  - Walkdowns including Containment during hot shutdown.
  - Interviewed Plant Personnel

# AMPs Discussion

- **Aging Management Program (AMP) Changes**
  - Buried Piping and Tanks Inspection Program (procedure revision)
  - Compressed Air Monitoring Program (supplemented LRA)
  - External Surface Monitoring Program (modified requirements)
  - Metal Fatigue of Reactor Coolant Pressure Boundary (procedure updated to include component)

# Operating Experience

- Operating Experience Review
  - System Program Results
  - Operating Experience related procedures and documents
  - Corrective Action Reports for Prior SSC Problems, associated with the AMPs reviewed

# Inspection Conclusions

## Overall

- Scoping of non-safety SSCs and application of the AMPs to those SSCs was acceptable
- Documentation supporting the application was auditable & retrievable
- Based on the review of the selected samples, our inspection results support a conclusion there is reasonable assurance that the effects of aging will be adequately managed

# SER Section 3

## 3.0.3 – Aging Management Programs

34 Aging Management Programs (AMPs) presented by applicant and evaluated in the SER

	Plant specific	Consistent with GALL	Consistent with exception	Consistent with enhancement	With exception & enhancement
Existing (28)	1	8	7	8	4
New (6)	0	5	0	0	1

# **SER Section 3 Open Items – Summary**

## **Four Open Items were identified during staff review:**

- Applicant's use of FatiguePro™ in metal fatigue calculations
- Potential Cracking in Ni-Alloy Steam Generator Divider Plate due to PWSCC
- Incorporation of recent Industry OE for Buried and Underground Piping and Tanks
- Various Issues in Work Control Process AMP

# SER Section 3 Open Items

## Metal Fatigue of Reactor Coolant Pressure Boundary

### OI 3.0.3.2.20-1:

- Applicant's use of FatiguePro™ in stress-based portion of metal fatigue calculations did not incorporate all portions of stress tensor for calculations on 2 RCS components
- Applicant agreed to perform updated, confirmatory fatigue calculations for the 2 affected components
- Submitted results to staff on June 1, 2010
- Staff in process of reviewing the results

# **SER Section 3 Open Items**

## **Cracking Due to PWSCC (Steam Generator Divider Plate)**

### **OI 3.1.2.1.7-1: Cracking due to PWSCC for Ni-Alloy SG Divider Plate**

- Extensive cracking due to PWSCC has been identified in some European SG divider plates, even with proper primary water chemistry
- Cracks in those SGs were found in stub-runner/divider plate region
- Staff concern of possible propagation into tubesheet cladding, tubesheet or into SG-RCS channel head
- Applicant provided RAI response July 22, 2010.
- Staff in process of evaluating applicant's response

# **SER Section 3 Open Items**

## **Buried Piping and Tanks Inspection**

### **OI 3.0.3.2.4-1:**

- Staff has noted a number of recent industry events involving leakage from buried and underground piping/tanks
- Staff is concerned about continued susceptibility to failure of buried/underground piping within the scope of license renewal
- Staff issued RAI on May 27, 2010, requesting applicant to:
  - Discuss all instances of leakage/ adverse conditions identified at KPS and how applicant's AMPs have been revised to address (past 5 yrs)
  - Discuss how the AMPs will address recent industry OE concerning aging effects in buried, underground, and limited access piping and tanks
- Applicant provided response July 22, 2010.

# **SER Section 3 Open Items**

## **Work Control Process Program Issues**

### **OI B2.1.32-1:**

- Staff has noted a number of issues in newly-submitted Work Control Process AMP
- Staff issued an RAI April 14, 2010, to request applicant explanations/justifications on these issues:
  - The program does not completely specify minimum percentages/ sample sizes/ inspection frequencies of populations
  - The OE examples create uncertainties as to whether the AMP will effectively manage the aging effects
  - Applicant's Commitment 25 was somewhat ambiguous
- Applicant's response received, staff in process of evaluating

## SER Section 3.5

### Section 3.5.2.2.2: Aging Management of In-Scope Inaccessible Concrete (below grade)

Parameter	Acceptance Criteria	KPS (2007-2009)	
		Min	max
pH	>5.5	7.10	8.17
Chlorides	<500 ppm	34 ppm	1240 ppm
Sulfates	<1500 ppm	36 ppm	422 ppm

Commitment: (Commitments 44 & 45) Take additional core samples to monitor concrete below ground level.

# SER Section 4.2

## SER Section 4.2.3: Pressurized Thermal Shock

Section 4.2.3 PTS Limits for Reactor Vessel Materials Due to Neutron Embrittlement

<b>RV Beltline Region Location (LRA Table 4.2-3)</b>	<b>RT<sub>PTS</sub> (Deg. F) (60 years, 52.1 EFPY)</b>	<b>RT<sub>PTS</sub> Acceptance Criteria (Deg. F)</b>
<b>Int. Shell-Lower Shell Girth Weld</b>	<b>297.5 °F<sup>1</sup></b>	<b>≤ 300 °F</b>
<b>Upper Shell Forging</b>	<b>164 °F</b>	<b>≤ 270 °F</b>
<b>Intermediate Shell Forging</b>	<b>146 °F</b>	<b>≤ 270 °F</b>

<sup>1</sup> – Calculated value determined using methodology approved by staff SE dated May 1, 2001, as exemption to 10 CFR50.61

## **Conclusion**

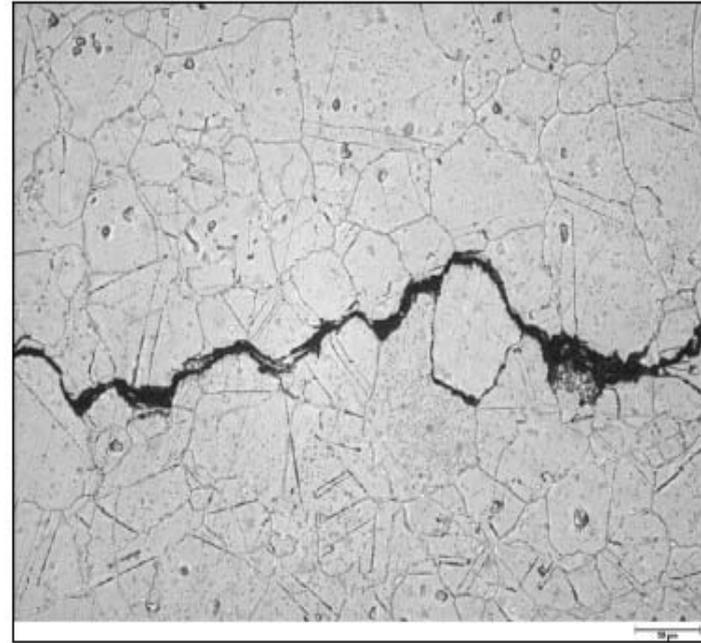
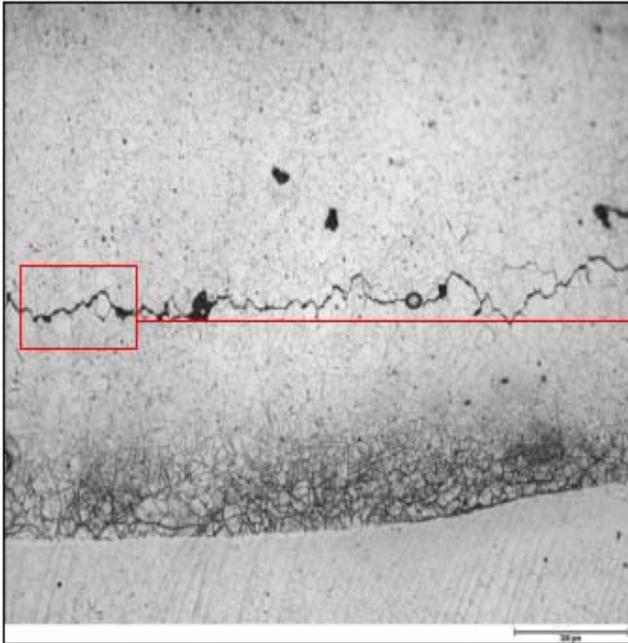
On the basis of its review and **pending satisfactory resolution of all open items**, the staff determines that the requirements of 10 CFR 54.29(a) have been met for the license renewal of Kewaunee Power Station.



**Advisory Committee on Reactor Safeguards (ACRS)  
License Renewal Subcommittee  
Kewaunee Power Station (KPS)  
Safety Evaluation Report (SER)  
with Open Items  
Extra Slides (If Needed)  
August 18, 2010**

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

# From EDF Presentation – Sept. 2006



Intergranular path characteristic of PWSCC of alloy 600



AUTORITE  
DE SURETE  
NUCLEAIRE

## STRESS CORROSION CRACKING OF THE INCONEL ZONES: POINT OF VIEW OF THE FRENCH NUCLEAR SAFETY AUTHORITY

Bureau de Contrôle des  
Chaudières Nucléaires

### 2005: PT results

