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Susquehanna Plant License Renewal

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

SUBCOMMITTEE ON PLANT LICENSE RENEWAL

+ + + + +

MEETING

+ + + + +

WEDNESDAY

APRIL 1, 2009

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ROCKVILLE, MD

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The Subcommittee convened in Room T2B3 in the Headquarters of the Nuclear Regulatory Commission, Two White Flint North, 11545 Rockville Pike, Rockville, Maryland, at 8:30 a.m., Dr William Shack, Chair, presiding.

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1 SUBCOMMITTEE MEMBERS PRESENT:

2 WILLIAM J. SHACK, Chair

3 JOHN D. SIEBER

4 SAM ARMIJO

5 JOHN W. STETKAR

6 MARIO V. BONACA

7 SAID ABDEL-KHALIK

8 OTTO L. MAYNARD

9 CHARLES H. BROWN, JR.

10 HAROLD B. RAY

11 CONSULTANT TO THE SUBCOMMITTEE PRESENT:

12 JOHN J. BARTON

13 NRC STAFF PRESENT:

14 PETER WEN, Designated Federal Official

15 BRIAN HOLIAN

16 DAVID PELTON

17 EVELYN GETTYS

18 GLENN MEYER

19 SAM LI

20 JAY ROBINSON

21 BILL ROGERS

22 ERACH PATEL

23 SAM LI

24 SIMON SHENG

25 CHUANG YANG

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ALSO PRESENT:

PHIL BRADY

NICK D'ANGELO

DUANE FILCHNER

DAVE FLYTE

ROSS GARDNER

MARK HAGER

JOHN KRAIS

MITCH McFARLAND

RICK PAGODIN

DALE ROTH

GARY STEVENS

BRUCE SWOYER

MASSOUD TAFAZZOLI

JEFF WEIK

JIM WILLIAMS

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

8:29 a.m.

CHAIR SHACK: The meeting will now come to order. This is a meeting of the Plant License Renewal Subcommittee. I am Bill Shack, Chairman of the Susquehanna Plant License Renewal Subcommittee.

ACS members in attendance are Mario Bonaca, Jack Sieber, Otto Maynard, Sam Armijo, Harold Ray, maybe, John Stetkar, Charles Brown and our consultant John Barton.

Peter Wen of the ACRS Staff is the Designated Federal Official for this meeting.

The purpose of this meeting is to review the license renewal application for the Susquehanna Stream Electric Station Units 1 and 2, the Draft Safety Evaluation Report and associated documents. We will hear presentations from representatives of the Office of Nuclear Reactor Regulation and the applicant PPL Susquehanna. The subcommittee will gather information, analyze relevant issues and facts and formulate proposed positions and actions as appropriate for deliberation by the full committee.

The rules for participation in today's meeting were announced as part of the notice of the meeting previously published in The Federal Register

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1 on March 16th, 2009.

2 We have received no written comments or  
3 requests for time to make oral statements from members  
4 of the public regarding today's meeting.

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

13 We have several people on the phone bridge  
14 lines listening the discussion. To preclude  
15 interruption of the meeting, the phone line is placed  
16 in a listen-in mode.

17 We will now proceed with the meeting and  
18 I call upon Brian.

19 Said Abdel-Khalik reminds me that he is,  
20 in fact, present and I didn't realized. Oh, Harold is  
21 definitely here.

22 We will now proceed with the meeting and  
23 I call upon Mr. Brian Holian of the Office of Nuclear  
24 Reactor Regulation to introduce the presenters.

25 MR. HOLIAN: Thank you. It's our pleasure

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1 to be here again for a Subcommittee on Susquehanna.  
2 My name's Brian Holian. I'm the Director of License  
3 Renewal.

4 I'd like to do some brief introductions  
5 and then just have a quick opening comment on  
6 Susquehanna Draft SER.

7 To my left is Mr. Dave Pelton. He's the  
8 Branch Chief for License Renewal and responsible for  
9 the Susquehanna plant among others. He'll also be  
10 here for the TMI plant this afternoon.

11 To his left is Evelyn Gettys, the Project  
12 Management for the Susquehanna project and to her left  
13 is Mr. Glenn Meyer, the Senior Reactor Inspector from  
14 the Division of Reactor Safety in Region I.

15 We have additional technical staff and  
16 branch chiefs in the audience to support our  
17 presentation later. I would like to mention a Branch  
18 Chief from Region I. Mr. Richard Conte is here also  
19 to support the inspection side of the house.

20 You know, the Susquehanna Plant Draft SER  
21 is -- just wanted to comment on a few items that  
22 aren't in it that the staff will touch after the  
23 licensee's presentation. One of the aspects that came  
24 out of the Inspector General Review of licensed  
25 general process was to increase our peer reviews over

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1 a year/year and a half ago. So, we've been doing that  
2 and have technical reviewers reviewing our draft SERs  
3 even as they come to ACRS.

4 You'll notice in the staff slides we have  
5 a couple of confirmatory items and an issue on Boral  
6 that we continue to look at in the Susquehanna SER.  
7 We've verbally talked about all three of these issues  
8 that we'll talk about, but I'll mention them here  
9 prior to the licensee's presentation.

10 One -- the first two items are some  
11 confirmatory items. We're still reviewing data from  
12 Susquehanna that deals with cycle counting which is  
13 often an issue that we look at. So, the staff may  
14 have been looking at that or aspects of that and we're  
15 verifying some of their cycle counting.

16 We're also looking at an issue with  
17 dissolved oxygen in the metal fatigue calculations.  
18 Just verifying what they historically have for  
19 dissolved oxygen content and the calculations and the  
20 assumptions and how that compares to their tech specs.

21 And finally, another issue that's come up  
22 recently on several plants is the Boral issue and, you  
23 know, aging effects of Boral and Susquehanna also has  
24 that and that's an item the staff continues to look at  
25 and review with them.

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1           So, I just wanted to mention those items.  
2           You'll hear them again in the staff's presentation,  
3           but I wanted to mention them before Susquehanna starts  
4           their presentation so the subcommittee's aware of  
5           that.

6           With that, I'll turn it over to Mr. John  
7           Krais, the Manager of Special Projects for  
8           Susquehanna.

9           MR. KRAIS: Thank you. Good morning. My  
10          name's John Krais. I am the Manager of Special  
11          Projects for PPL Susquehanna. Thank you for the  
12          opportunity to discuss the Susquehanna License Renewal  
13          Request.

14          With me here today are Rick Pagodin,  
15          General Manager of Engineering at Susquehanna; Nick  
16          D'Angelo, Manager of Station Engineering; Dave Flyte,  
17          License Renewal Lead Engineer who will be speaking to  
18          you later and we also have with us subject matter  
19          experts and the License Renewal Project Team including  
20          representatives from AREVA and Structural Integrity  
21          who assisted us in our license renewal application  
22          preparation.

23          Now, we would like to discuss the  
24          background and operating history of Susquehanna, major  
25          modifications and investments in that plant as well as

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1 our License Renewal Team and schedule.

2 Dave Flyte will be presenting a scoping  
3 discussion, application of GALL, commitment process  
4 and topics of interest.

5 A little background on Susquehanna,  
6 Susquehanna's located in Northeast Pennsylvania  
7 approximately 20 miles southwest of Wilkes-Barre. The  
8 plant is owned by PPL Susquehanna LLC and co-owned by  
9 Allegheny Electric Cooperative. The licensee operator  
10 is PPL Susquehanna.

11 Susquehanna has two BWR units licensed up  
12 to 3952 megawatts-thermal and I'll discuss our current  
13 operation in a few slides.

14 Generator rating is 1300 megawatts-  
15 electric. General Electric is our NSSS supplier and  
16 Bechtel is our AE.

17 The ultimate heat sink is provided by a  
18 spray pond and turbine cycle cooling is provided by  
19 natural draft cooling towers with make-up water being  
20 pumped from the Susquehanna River.

21 Brief discussion of our operating history,  
22 construction permit for Susquehanna was issued in  
23 November of 1973 and the operating licenses were  
24 issued Unit 1 in July of 1983 and for Unit 2 in March  
25 of 1984.

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1 We implemented a stretch power uprate of  
2 approximately 4.5 percent. That took us from 3293  
3 megawatts-thermal to 3441 megawatts-thermal and that  
4 was implemented for Unit 2 in April of '94 and Unit 1  
5 in February of '05.

6 Our measurement uncertainty recapture  
7 uprate of approximately 1.5 percent was completed in  
8 July of 2001. We submitted our license renewal  
9 application in September of 2006 and in power with  
10 that, our extended power uprate review occurred and we  
11 received the extended power uprate renewal in January  
12 of 2008. Extended power uprate took us to 3952  
13 megawatts-thermal.

14 Our current license expires for Unit 1  
15 July 17th of 2022 and then March 23rd of 2024 for Unit  
16 2.

17 Some of our recent operating history at  
18 Susquehanna, our refueling outage 15 was completed in  
19 April 2008 and our first step EPU was implemented in  
20 May 2008. That first step increased our operating  
21 power levels from 3489 to 3733 and our full uprate to  
22 3952 megawatts-thermal. In 2010, final installation  
23 of new reactor feed pump turbines. Unit 2, refueling  
24 outage 13 was completed in April of 2007 and we're  
25 currently on a record continuous run of 718 days.

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1 MR. BARTON: Your refueling cycle is?

2 MR. KRAIS: Twenty-four months.

3 CHAIR SHACK: Now, which one of these  
4 units is got the instrumented stream dryer?

5 MR. KRAIS: Unit 1 has the instrumented  
6 stream dryer and we've --

7 CHAIR SHACK: Any interesting things occur  
8 when you implemented the first-step EPU?

9 MR. KRAIS: The response is as we  
10 expected. The first step for EPU for Unit 2 will be  
11 implemented in May of 2009. The increased power  
12 levels to 3733 megawatts-thermal and the full operate  
13 to 3952 will occur in 2011. Again, following the  
14 installation of the new reactor feed pump turbines.

15 These next two slides is a sampling of  
16 some of the modifications and improvements made at  
17 Susquehanna. These modifications are instead and have  
18 been evaluated for license renewal. Our plant  
19 modification process includes administrative  
20 requirements to insure that license renewal is  
21 considered and evaluated when designing and  
22 implementing mod.

23 For example, we have replaced feedwater  
24 heaters and moisture separator vanes based on  
25 inspection results from condition monitoring that

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1 identified some degraded material conditions. Those  
2 are just some examples of --

3 CHAIR SHACK: Now, your hydrogen water  
4 chemistry is that with noble metal additions?

5 MR. KRAIS: That is not with noble metal  
6 additions.

7 CHAIR SHACK: Standard hydrogen water  
8 chemistry.

9 MR. KRAIS: That's correct.

10 MEMBER SIEBER: In this list, most of the  
11 items are wear and tear items, but the diesel is not.  
12 Why did you add extra diesel?

13 MR. BRADY: This is with the --  
14 Susquehanna. The fifth diesel was added very early in  
15 the plant life. The issue is that we have basically  
16 a 72-hour LCO with a diesel out of service.

17 MEMBER SIEBER: Right.

18 MR. BRADY: It affects both units.

19 MEMBER SIEBER: Okay. That's --

20 MR. BRADY: So, we added a fifth diesel  
21 which we can substitute for any one of the original  
22 four diesels.

23 MEMBER SIEBER: Okay.

24 MR. BRADY: And not have to shut the  
25 plants down.

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1 MEMBER SIEBER: Thank you.

2 CHAIR SHACK: You have a modification of  
3 your core shroud, too. Right? Or no, it's  
4 unrepaired?

5 MR. KRAIS: We do not have a modification  
6 on a core shroud.

7 CHAIR SHACK: Okay. What's the -- oh,  
8 okay. Maybe you'll talk about the condition of the  
9 core shroud sometime.

10 MR. KRAIS: We can touch on that. Yes.  
11 License renewal team -- project team was assembled and  
12 initiated in 2002 and our PPL and AREVA team was  
13 established in 2004.

14 Our license renewal team is engaged with  
15 the industry. We have members on the NEI License  
16 Renewal Task Force and the various discipline working  
17 groups since 2001. We've also observed audits and  
18 inspections at two peer plants and participated in  
19 four other license renewal peer reviews at other  
20 plants.

21 Our license renewal application was also  
22 reviewed by an independent industry group.

23 Plant subject matter experts including  
24 station system engineers and program owners are  
25 involved in the development of basis documents for

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1 license renewal and review and have agreed to the  
2 aging management commitments and programs that our  
3 license renewal application contains.

4 License renewal schedule, license renewal  
5 was prepared in conjunction with our extended power  
6 uprate project and both projects are part of a special  
7 projects groups. The license renewal application was  
8 developed at EPU conditions and submitted in September  
9 of 2006.

10 Our EPU submittal occurred at  
11 approximately the same time, October of 2006, and the  
12 EPU occurred first.

13 Around January of 2007, our license  
14 renewal safety review was placed on hold pending  
15 completion of the EPU review and during this time,  
16 however, our environmental review continued.

17 Upon issuance of the EPU license in  
18 January of '08, the safety review resumed.

19 At this point in time, I'd like to turn it  
20 over to Dave Flyte who will discuss some details of  
21 the license renewal application.

22 MR. FLYTE: Thanks, John. Good morning,  
23 everyone.

24 I'd like to talk about some of the  
25 specific aspects of the license renewal process for

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1 Susquehanna and the license renewal application itself  
2 including touching on scoping, how we use the GALL  
3 report in preparing the application, a little bit of  
4 -- just a brief touch on time-limited aging analyses  
5 and finally on this segment looking at the commitment  
6 process.

7           Scoping was preformed in accordance with  
8 industry guidance -- established industry guidance in  
9 NEI 95-10 Revision 6. For the non-safety effecting  
10 safety spacial interaction scoping, we used the  
11 conservative spaces approach. We did develop  
12 mechanical boundary drawings as a reviewer's aid.  
13 Mechanical boundary drawings showed all three  
14 categories of in-scope components. The (a)(1) safety  
15 related, the (a)(2) non-safety effecting safety and  
16 the (a)(3) regulatory -- regulated against.

17           MEMBER STETKAR: Dave.

18           MR. FLYTE: Yes.

19           MEMBER STETKAR: In the -- I read through  
20 the inspection -- the regional inspection report and  
21 they mentioned HPCI cables running through the Unit 1  
22 turbine building that you determined did not have an  
23 affect on operation at HPCI. What are those cables?

24           MR. FLYTE: They're actually cables that  
25 are running through the Unit 2 turbine building and

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1 they're the cables for the suction swapover for HPCI  
2 on the low condensate storage tank level.

3 MEMBER STETKAR: And that's not credited  
4 in the licensing analysis? The swapover is not?

5 MR. FLYTE: The swapover is credited, but  
6 we entered that situation into our Corrective Action  
7 Program, did an evaluation on it and we determined  
8 that the only thing that could impact those cables is  
9 a high-energy line break and if you look at the -- the  
10 help evaluation, it does not rely on this, on the  
11 swapover. So, from that perspective with the only  
12 thing that could impact them, you know, it didn't  
13 matter that they were in the turbine building.

14 MEMBER STETKAR: Okay. Thanks.

15 MR. FLYTE: In aging management reviews,  
16 we made extensive use of the GALL report. Guidance in  
17 NEI-95-19 which basically comes down to identifying  
18 all the various combinations of component material,  
19 environment and aging effects that are present for the  
20 passive components in the scope of license renewal.

21 We compared those lists of combinations to  
22 the aging management review tables in GALL and found  
23 that we were -- had about an 82 percent match between  
24 the two lists.

25 The items that are left off the table

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1 there that are consistent but equally divided among  
2 three major categories. The first of which is where  
3 the environment for a given component and material is  
4 not in GALL and about two-thirds of those that we  
5 found actually turn out to have no aging effects that  
6 require management. So, they weren't a big issue  
7 there.

8           You know, one example would be copper  
9 cooling coils in a heat and ventilation system that  
10 are exposed to ventilation environment. No aging  
11 effect requiring management.

12           Another grouping about equal in size was  
13 -- with the aging effect was not in GALL for  
14 complement material environment combination. So, we  
15 identified things that weren't specifically listed in  
16 GALL. A lot of these turned out to be copper  
17 components cracking in a treated water system.

18           And the leading group was where the GALL  
19 aging effect, GALL identified an aging effect and our  
20 aging management review didn't show that aging effect  
21 on over half of these that happened to be concrete and  
22 for them, we have a confirmatory program anywhere. We  
23 have a program credited for managing that and  
24 confirming that there's no aging effect. So, even  
25 though we included AMR, that is not the program that

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1 is there.

2 CHAIR SHACK: So, you had admiralty brass  
3 or some components in places where GALL didn't expect  
4 to find those materials?

5 MR. FLYTE: Yes, that's -- I think that's  
6 a good characterization.

7 CHAIR SHACK: Okay.

8 MR. FLYTE: The other place that we made  
9 extensive use of the GALL report is in the evaluation  
10 of the aging management programs that are credited for  
11 license renewal. You can see about 20 of those --  
12 well, 20 of those programs are existing programs that  
13 require no change. So, they lined up well with the  
14 GALL programs or the evaluations that were done in  
15 GALL.

16 Another 12 of those programs are existing  
17 programs that we saw we needed to make some kind of  
18 enhancement in order to get them to align with the  
19 GALL evaluation. So, we committed to those  
20 enhancements.

21 And lastly, there's about 19 new programs  
22 that were identified for license renewal. Ten of  
23 which are one-time inspections.

24 Overall if you look at the split, you can  
25 see that the majority of the programs are GALL related

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1 or they have a GALL counterpart and we do have only  
2 four plant specific programs.

3 MEMBER STETKAR: Dave. Another question  
4 on this fuel oil tank program. Your fuel oil tanks  
5 are lined with something or other. What are they  
6 lined with? It's the fuel oil storage tanks. Not the  
7 oil tanks.

8 MR. FLYTE: Yes. Bill, do you know that  
9 -- do you know what they're lined with? I know  
10 they're lined, but I --

11 MEMBER STETKAR: There was an exception  
12 taken that you couldn't do measurement of the  
13 thickness of the bottom of the tanks because you'd  
14 have to remove the lining and I was curious what --

15 MR. BARTON: Was that about the lining or  
16 was that a coating?

17 MR. FLYTE: A coating. A coating.

18 MR. BARTON: On the outside of the tank.

19 MEMBER STETKAR: No, I think it's on the  
20 inside.

21 MR. BARTON: The inside.

22 MR. FLYTE: Inside.

23 MR. BARTON: Okay.

24 MR. ROTH: Dale Roth. I'm the Supervisor  
25 of Program and Testing at Susquehanna.

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1 Yes, they are coated. They just have  
2 epoxy coding.

3 MEMBER STETKAR: Okay.

4 MR. D'ANGELO: Let me just -- the coding  
5 of the tanks are coated with a Carbomaster 14 on the  
6 interior.

7 CHAIR SHACK: Which is what?

8 MR. D'ANGELO: I don't know. Not really  
9 sure.

10 MEMBER STETKAR: It's called Carbonmaster  
11 14.

12 MR. D'ANGELO: Carbomaster.

13 MEMBER STETKAR: Carbomaster?

14 MR. D'ANGELO: Fourteen.

15 MEMBER STETKAR: All right. Hold on a  
16 second. I was curious. The rationale you said well,  
17 we can't -- we're going to take credit for measuring  
18 the potential thinning of the fuel oil day tanks  
19 because that will tell us whether there's corrosion  
20 going on in the fuel oil storage tanks.

21 I was curious about that because I wasn't  
22 quite clear how the direct correlation was made  
23 between those. It kind of depends on where the fuel  
24 oil transfer pumps take suction from the fuel oil  
25 storage tanks. If they take suction directly from the

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1 bottom, I can see that rationale, but oftentimes they  
2 don't. So, you can get a good stagnant layer of  
3 whatever at the bottom of the tank and you don't  
4 really mix up.

5 So, where do your transfer pumps actually  
6 take suction. Is it relatively above the bottom of  
7 the tank?

8 MR. D'ANGELO: Yes, the suctions do come  
9 off the bottom of the tank.

10 MEMBER STETKAR: Oh, directly off the  
11 bottom or --

12 MR. D'ANGELO: They're elevated off the  
13 bottom on a pedestal.

14 MEMBER STETKAR: Okay. So, there could be  
15 a stagnant layer of fuel and contaminants at the  
16 bottom of the storage tank that you'd never -- you  
17 never really deliver that stuff into the day tank.

18 MR. D'ANGELO: That is correct. However,  
19 we do do sampling on the fuel oil tanks and we do  
20 sample down to the bottom of the tank.

21 MEMBER STETKAR: To the bottom. Okay.  
22 Good.

23 MR. D'ANGELO: Yes.

24 MEMBER STETKAR: Thank you. Sorry.

25 MR. BARTON: Since you can't use UT, what

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1 is your program for visual inspections of the tanks?  
2 Is it a visual or what? What is your aging program  
3 for those tanks? For the storage tanks?

4 MR. FLYTE: Dale, can you address that  
5 question?

6 MR. ROTH: Yes, this is Dale Roth again.  
7 Yes. We use -- we have a periodic inspection of the  
8 tank. I think it's every ten years and we do a visual  
9 inspection of the coating for integrity to look for  
10 any degradation. A good coating translates into a  
11 good solid structurally sound tank.

12 MEMBER ABDEL-KHALIK: When was the last  
13 inspection? Major inspection?

14 MR. ROTH: We just completed inspection of  
15 one of the diesels this summer. So, I'm not sure  
16 exactly which of the five, but we do them, I think,  
17 every ten years and I'm not sure of the exact  
18 schedule, but we just completed one this summer.

19 MEMBER ABDEL-KHALIK: Everything was fine.

20 MR. FLYTE: I would like to talk briefly  
21 about the exceptions that we found when we did the  
22 comparison with the GALL evaluations.

23 The programs are consistent with GALL with  
24 a few exceptions. The exceptions don't mean that  
25 there's a particular problem. It just means we've

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1 taken a different approach and our evaluation did  
2 conclude in all cases that aging would be effectively  
3 managed.

4 I think the number of the exceptions are  
5 pretty typical of what we've been seeing across the  
6 industry. Ours are in the areas of scope differences  
7 between the programs, use of alternative inspection or  
8 monitoring methods and differences in the parameters  
9 we look at, how we detect aging effects and some of  
10 the preventive actions that we take.

11 MEMBER SIEBER: How many exceptions did  
12 you say you --

13 MR. FLYTE: There's a total of 13  
14 exceptions.

15 MEMBER SIEBER: Okay.

16 MR. BARTON: On your aging management  
17 program for reactive S internals, section on cracking  
18 due to cyclic loading stainless steel BWR jet pump  
19 sensing lines, if you take exception to instrumental  
20 lines inside the vessel because they do not perform an  
21 intended function, now, these are jet pump  
22 instrumentation lines, you know, what are these lines  
23 used for and aren't they subject to cracking and  
24 becoming loose parts?

25 MR. FLYTE: I believe Mitch can provide a

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1 response to that.

2 MR. MCFARLAND: This is Mitch McFarland  
3 with the Washington Oil Team. We have evaluated that  
4 situation. I'm sorry. Mitch McFarland with the  
5 Washington Oil Team.

6 We did evaluate that situation inside the  
7 vessel. The jet pump sensing lines are used for  
8 information but are not credited for accident  
9 mitigation or required for accident mitigation.

10 We've looked into -- there's an evaluation  
11 in BWR VIP 06 DSER for that. I believe it is ADAMS  
12 number MC7448 that evaluated the impact of those  
13 becoming loose parts and determined that they would  
14 not be able to leave the shroud.

15 MR. BARTON: Okay. Thank you.

16 MR. FLYTE: The next area I'd like to  
17 touch on briefly is time-limited aging analyses. We  
18 identified TLAAs in accordance with guidance that we  
19 find in standard renew plans for license renewal,  
20 NUREG-1800 and the guidance in NEI 95-10. TLAAs are  
21 dispositioned in accordance with 10 CFR 54.21(c)(1).

22 CHAIR SHACK: Just on there, I mean you're  
23 environmental fatigue is fairly sensitive to your  
24 dissolved oxygen levels and your measurements of  
25 dissolved oxygen levels are made where?

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1 MR. WEIK: This is Jeff Weik, Mechanical  
2 Lead for the PPL Project Team.

3 I'm not exactly sure of where they pull  
4 the samples. The information that we have from our  
5 chemistry group that we -- in fact, that we used in  
6 the calculations for the EAF results were such that we  
7 requested information from the chemistry group that  
8 would be indicative of the lower vessel region for  
9 reactor water and we also pull samples for the  
10 feedwater system that are indicative of the feedwater  
11 returning the reactor vessel.

12 CHAIR SHACK: Well, it is sort of -- I  
13 mean, you know, the feedwater's going to have a  
14 different oxygen. I mean typically the recirculation  
15 lines are going to have much lower oxygen levels than  
16 inside the vessels and so, it does sort of become  
17 important exactly where those samples are being taking  
18 from if you're taking credit for those low oxygen  
19 levels.

20 MR. WEIK: Well, for the reactor itself,  
21 the locations of the reactor vessel, we are using the  
22 reactor water values provided to us by chemistry.  
23 Currently --

24 CHAIR SHACK: Are those measurements or  
25 are those projected from some hydrogen water chemistry

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1 novel?

2 MR. WEIK: Those are daily measurements  
3 taken, daily samples and we use the reactor water  
4 values which before hydrogen water chemistry were  
5 typically in the range of 250 to 280 parts per billion  
6 and following hydrogen water chemistry, they're not  
7 typically -- they're maintained less than two.  
8 They're typically running well under two.

9 The feedwater levels have shown that they  
10 are consistently in the 20 to 50 part per billion  
11 range and we actually maintain them above 30 parts per  
12 billion now under hydrogen water chemistry.

13 CHAIR SHACK: Those vessel levels sound a  
14 little low to me for normal water chemistry if they're  
15 actually being made inside the vessel.

16 MR. D'ANGELO: The reactor water cleanup  
17 influence system is where we get our dissolved oxygen  
18 samples. That ultimately takes a suction from the  
19 recirc loops and bottom head drain.

20 CHAIR SHACK: Okay. But, then how are you  
21 -- well, does that bound -- that doesn't bound all the  
22 oxygen levels for all the components.

23 MEMBER SIEBER: No.

24 CHAIR SHACK: What happens to your fatigue  
25 analyses for, you know, somewhat higher oxygen levels

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1 in the reactor internals?

2 MR. PAGODIN: Bill, this is Rick Pagodin.

3 Again, I think this is an issue that we've  
4 recently just started looking into with the staff. We  
5 were going through and getting additional data and  
6 we're providing -- we have some -- we've had some  
7 discussions on that. I think this is an area where we  
8 need to finish that review and have all of that data  
9 collected for both us and the staff to look at.

10 MR. FLYTE: The license renewal process  
11 for Susquehanna resulted in identification of 59 new  
12 regulatory commitments. Fifty-one of these are for  
13 implementation of aging management programs be it  
14 either continuance of a program, putting a new program  
15 in place or enhancing an existing program.

16 These commitments have all already been  
17 entered into the Susquehanna commitment tracking  
18 process. They've been assigned to an individual at  
19 the station for implementation.

20 The commitment process -- commitment  
21 tracking process has oversight by our Nuclear  
22 Regulatory Affairs Group and that's just another  
23 vehicle to make sure that they get implemented.

24 From this, I'd like to move into several  
25 topics of interest. First is an inspection of a

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1 piping vault that includes -- is an underground vault.  
2 Includes RHR service water and ESW emergency service  
3 water piping. This was requested by the Region I  
4 inspectors when they were onsite for the inspection  
5 during last August. It couldn't be arranged to occur  
6 during the inspection. So, one of the inspectors  
7 returned to the site later on to witness when the  
8 vault was opened.

9 Part of the motivation to opening the  
10 vault was to insure that the information we assumed in  
11 the evaluation for the aging management review was  
12 correct. That the environment inside the vault was  
13 what we assumed.

14 Yes, sir.

15 MEMBER STETKAR: If I recall from the  
16 inspection report, this vault was not originally  
17 included in your inspection program. Is that correct?  
18 This vault was subsequently added after the  
19 inspection.

20 MR. FLYTE: That is correct. That is  
21 correct.

22 MEMBER STETKAR: Requested to look at.

23 MR. FLYTE: Yes.

24 MEMBER STETKAR: Okay. Thanks. I just  
25 wanted to make sure I remembered the same vault.

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1 MR. FLYTE: Yes, it's the same one.

2 Conditions, again, we conditions in the  
3 vault to be dry because design drawings show that both  
4 the lid and the piping penetrations were sealed -- had  
5 seals. We did open the vault and conditions were as  
6 expected.

7 We performed some inspections of the  
8 coatings, wrapping of the pipe and the general -- and  
9 found conditions to be acceptable. No significant  
10 degradation.

11 The next topic of interest is underground  
12 medium voltage cables. Susquehanna has both 15 kV and  
13 05 kV cables that are in scope of license renewal and  
14 have segments that run in underground duct banks. I  
15 want to talk about the 15 kV cables first. They're in  
16 non-safety related circuits and they're in scope of  
17 license renewal for the station blackout recovery.  
18 Talk about these in two segments.

19 The first segment is from the low side of  
20 the startup transformers and runs into the turbine  
21 building. There's a stretch that goes underground.  
22 Includes five manholes and from past inspections of  
23 those manholes we observed submerged cables in two of  
24 those manholes.

25 The other segment of this circuit is from

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1 the reactor building out to the engineered safeguard  
2 services transformers. So, a very short one. No  
3 manholes in that underground run. So, obviously, no  
4 inspection to see about water. Had no operating  
5 experience.

6 The fact that we've had cables submerged  
7 in water, these are energized greater than 25 percent  
8 of the time. They're the offsite power supply  
9 sources. So, therefore, since we have the stressors  
10 present to require or suggest an aging management  
11 program, so, we committed to the aging management  
12 program for these cables for license renewal which  
13 results in periodic testing and inspection, pumped  
14 down to the manholes to keep the cables from being  
15 exposed to standing water.

16 MEMBER BROWN: How often do you inspect  
17 them? Are you going to inspect them? I mean it's 15  
18 kV cables buried in water. It's not high on anybody  
19 list to maintain.

20 MR. FLYTE: Phil Brady can address that  
21 question.

22 MR. BRADY: Phil Brady. I'm the  
23 Supervisor of Retro and INC Design at Susquehanna.

24 The inspection process, after we had done  
25 some inspections of looking at the water for

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1 approximately an eight-month period at Susquehanna,  
2 measuring the water level intact in each of these  
3 manholes and draining them down, we have established  
4 pump-down frequencies to, in fact, assure ourselves  
5 that we'll maintain the water level below any of the  
6 medium voltage cables in the future.

7 Obviously, as we continue that process,  
8 we'll look further as far as if we'll have to make any  
9 refinements to that number based on our actual  
10 experience as we go into it, but our plan is --

11 MEMBER BROWN: So, you inspect to see  
12 where that level -- they're obviously refilling.

13 MR. BRADY: That's correct.

14 MEMBER BROWN: So, you try to determine  
15 what the periodicity of the refilling was and then do  
16 pumping to keep them below those levels?

17 MR. BRADY: That is correct.

18 MR. BARTON: Where did you incorporate  
19 this? Is it in your PM program or what?

20 MR. BRADY: Yes, it is. It's in our PM  
21 program. We have those for the various offsite power  
22 supply cables coming in from T10 and T20.

23 MEMBER MAYNARD: Have you found that the  
24 rate of the water intrusion -- is it related to  
25 weather in anyway or is it just fully steady over a

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1 given period of time?

2 MR. BRADY: The eight-month period did  
3 include some fairly significant rainfalls at different  
4 times during the course of the year. We did look at  
5 that. We're not able at this point to make the direct  
6 correlation that it is just rainwater. We know the  
7 manholes are not necessarily sealed as an entity. So,  
8 it is possible we still have some groundwater that's  
9 also coming into the manhole systems.

10 MEMBER STETKAR: You mentioned an eight-  
11 month period that you monitored things. Had you  
12 checked for water before that eight-month period?

13 MR. BRADY: No, the only time -- at that  
14 time, the only times we would have been going into the  
15 manholes would have been if we were doing some  
16 physical work activity, maintenance activities.  
17 Things along that line would have been our only time  
18 at that point under these particular manholes.

19 MEMBER STETKAR: As you know, I mean this  
20 is not necessarily specific license renewal issue.  
21 It's a current --

22 MR. BRADY: No.

23 MEMBER STETKAR: -- it's a current issue.  
24 So, I know that a lot of these topics will get  
25 resolved as part of the current licensing basis, but

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1 I'd -- have you done any testing of the insulation on  
2 those cables since --

3 MR. BRADY: Yes, we've --

4 MEMBER STETKAR: You have.

5 MR. BRADY: Yes, we have. All of our --  
6 our cables initially were all done under double  
7 testing during the initial construction and startup  
8 phase.

9 MEMBER STETKAR: Initial.

10 MR. BRADY: And we have, in fact, in many  
11 of these cases, our safety-related cables, we've had  
12 on a frequency of approximately about a four-year  
13 frequency to do a double test on those cables and  
14 verify the insulation.

15 The outside power sources, we, in fact,  
16 have, in fact, instituted a program. We're also on a  
17 four-year frequency under a PM program to now do  
18 double testing on those cables.

19 MEMBER STETKAR: That's double testing?

20 MR. BRADY: Double testing. That's  
21 correct.

22 MEMBER BROWN: For the uninitiated like me  
23 on what doubles, is that just twice the voltage?

24 MR. BRADY: No. No. No. Double testing  
25 is looking at a power factor testing.

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1 MEMBER BROWN: Oh. Okay.

2 MR. BRADY: It's looking at the actual  
3 insulation from a power factor standpoint.

4 MEMBER BROWN: Okay.

5 MR. FLYTE: A typical grouping of cables  
6 that's included with the scope of license renewal  
7 meeting voltages is the 5 kV and these are safety  
8 related cables and the circuits that they're involved  
9 with are emergency diesel generators, the RHR service  
10 water and the emergency service water systems.

11 The underground duct bank run for these  
12 includes ten manholes. Previous inspections of these  
13 ten manholes did not show any cables -- meeting  
14 voltage cables being submerged.

15 These cables are also energized less than  
16 25 percent of the time. So, we concluded from our  
17 aging management review that they don't meet either of  
18 the criteria established in the GALL report for having  
19 the stressors that would require an aging management  
20 program and, therefore, there's no additional  
21 commitment for a license renewal aging management  
22 program for these cables.

23 MEMBER STETKAR: Your ESW pumps don't  
24 normally run. I don't know Susquehanna. So, I --  
25 they're normally a standby?

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1 MR. D'ANGELO: That's correct.

2 MEMBER STETKAR: Okay.

3 MEMBER BROWN: You do inspect even though  
4 you -- is there -- I presume there's an inspection  
5 frequency for these. Even though you typically don't  
6 find them, you just don't want away and ignore them.  
7 Right?

8 MR. FLYTE: Yes, I'll let Phil address  
9 that.

10 MR. BRADY: Yes, again, this is Phil  
11 Brady.

12 Yes, we do inspect those manholes as well  
13 and are using the operating experience that we gained  
14 through that similar eight-month period to look at  
15 periodicity to go into those and actually pump them  
16 down and verify the water is, in fact, being  
17 maintained below the medium voltage cables.

18 Even though as Dave pointed out, by the  
19 GALL report, they are not energized more than 25  
20 percent.

21 MEMBER BROWN: I understand that.

22 MEMBER STETKAR: Phil, do those manholes  
23 also contain non-safety related medium voltage cables  
24 that are normally energized? Like what do they call  
25 your normal surface water pumps, you know, that are

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1 run in the same --

2 MR. BRADY: We do have -- I'd have to look  
3 at it. We do have cables that do come out of our  
4 building going down to the river intake structure down  
5 the Susquehanna River that are, in fact, non-safety  
6 related and they're 15 kV cables as well and, in fact,  
7 are energized on a continuous basis and, in fact, we  
8 are monitoring one of the -- those two cables running  
9 down to that intake structure because we do know that  
10 at the river those cables have been subjected to water  
11 on a continuous basis because of the water table near  
12 the river quantity. So, we are monitoring those and  
13 doing double testing. In fact, our frequency on  
14 those, we're testing right now on a yearly basis.

15 MEMBER STETKAR: Do they run through the  
16 same ducts? The same cable --

17 MR. BRADY: You know, not on the same  
18 trays, but --

19 MEMBER STETKAR: No. No. Through the  
20 same cable ducts as the safety related cables. Do you  
21 know?

22 MR. BRADY: I believe in front of the  
23 diesel generator building, they do. I think they're  
24 on separate sides of the manhole is the way we  
25 separated those, but they, in fact, run through it

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1 because then the duct bank continues down from that  
2 location down toward the river.

3 MR. FLYTE: The last item of -- topic of  
4 interest that I'd like to touch on is scoping that was  
5 done for station blackout recovery. Grounding for the  
6 outside power supplies is established at this point  
7 for the latest staff guidance.

8 Moving out from the plant, out from the  
9 startup transformers, in fact, toward the transmission  
10 system, this includes the overhead transmission lines  
11 between the startup transformers, structures that  
12 support the out into the first breakers that you get  
13 to in the switchyards and that includes circuit  
14 breakers at the 230 kV level in three switchyards.

15 MR. BARTON: Let me ask you a question.  
16 Do you have an overhead you can show the station  
17 blackout arrangements so we can follow your  
18 description of how this is designed?

19 MR. FLYTE: In fact, we do and I'd ask  
20 Phil if you can just walk us through this. Just  
21 explain the layout here.

22 MR. BRADY: Again, this is Phil Brady.  
23 When you look at the slide, basically, the  
24 connection on the top left-hand part of the slide is  
25 coming from a T-10 ring bus. That's one of our

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1 sources of offsite power into our startup transformer  
2 T10. So, that's one of the connections.

3 We have a two-breaker connection up in  
4 that switchyard that is part of the SBO scope.

5 Our T20 source is off of a -- it's tapped  
6 off of a line which goes between our 230 kV switchyard  
7 which is across the river on the east side of the  
8 Susquehanna River and also has a breaker connection  
9 coming from an auto-transformer from our 500 kV to 230  
10 kV. We use that breaker as the breakpoint on the  
11 connection.

12 So, again, one breaker off of the auto-  
13 transformer, two over in the 230 kV switchyard across  
14 the river and two in the T10 switchyard. Associated  
15 with the T10.

16 MEMBER BONACA: Could you comment on  
17 containment shelf, the conditions of the shelf?

18 MR. FLYTE: Thanks, Phil. We're done.

19 Yes, the -- Bruce, could you just comment  
20 on the condition of the containment liner?

21 MR. SWOYER: This is Bruce Swoyer, Design  
22 Engineer in Susquehanna.

23 You would like to know the suppression  
24 pool containment liner status. Correct?

25 We have done inspections on both units.

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1 As a matter of fact, the last inspection was done in  
2 2007 and we have had divers, NDE-qualified divers go  
3 in and do a visual inspection on the liner and we  
4 found no holes that were problems.

5 MEMBER BONACA: Have you experienced  
6 advance of the liquid over the --

7 MR. SWOYER: No, we have not.

8 CHAIR SHACK: Just coming back to your  
9 hydrogen water chemistry, since you sort of credit the  
10 hydrogen water chemistry in the fatigue analysis, does  
11 that mean that you're crediting hydrogen water  
12 chemistry operation for the extended license period?

13 MR. FLYTE: Gary, could you address that  
14 please?

15 MR. STEVENS: This is Gary Steven  
16 Structural Integrity.

17 The answer is yes. I think similar to the  
18 other evaluations you've seen for the other plants,  
19 there's an assumed duty going forward for the hydrogen  
20 water chemistry system. So, there's a time averaged  
21 -- over the 60-year life of the plant, there's a time  
22 averaged chemistry assumed that considers normal water  
23 chemistry prior to hydrogen water chemistry  
24 implementation. What the availability of the system  
25 has been since implementation and then an assumed

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1 level going forward.

2 CHAIR SHACK: Just -- your Commitment 60  
3 seems to address most of the questions associated with  
4 the FatiguePro software, but since we have Gary here  
5 and he understand this, can you explain what you did  
6 to benchmark FatiguePro so far? I wasn't quite sure  
7 exactly what you did.

8 MR. STEVENS: Susquehanna has the  
9 advantage of -- and they've had 20 years experience  
10 with FatiguePro. Originally when it was developed and  
11 we're talking about the stress-based fatigue locations  
12 here that are on two components, the feedwater nozzle,  
13 both the safe in and the nozzle foraging end, and the  
14 CRD penetrations.

15 Originally when it was developed, it was  
16 benchmarked up against the design basis NB-3200, you  
17 know, stress reports and how that was done is on two  
18 items. Number one, the stress intensity predictions  
19 that were coming out of FatiguePro were matched up  
20 against those predicted for design transients and then  
21 also, it was -- the fatigue usage itself was looked at  
22 to make sure that was what coming out of FatiguePro  
23 was consistent or bounding compared to those stress  
24 reports.

25 CHAIR SHACK: Okay. So, FatiguePro

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1 doesn't take credit for doing a finite element  
2 analysis that gives lower stresses than your design  
3 methods would. You just scale the results back up.

4 MR. STEVENS: Correct.

5 CHAIR SHACK: Is that standard or is that  
6 a Susquehanna implementation feature?

7 MR. STEVENS: It's fairly standard. Not  
8 all plants have done that extensive of a benchmarking.  
9 It's becoming more standard.

10 CHAIR SHACK: Yes, I can understand that.

11 MR. STEVENS: This was done from the  
12 beginning at Susquehanna. So. And part of that was  
13 due to they were one of the first plants to implement  
14 FatiguePro. So, it was -- I think there was a lot  
15 more rigor put in in the early days to substantiate  
16 the initial, you know, versions of the program that  
17 were just recently developed.

18 MR. FLYTE: We passed over a question  
19 earlier about the condition of the course route.

20 CHAIR SHACK: Yes.

21 MR. FLYTE: At this time, we'd like to  
22 pick that up. If Bruce could address that.

23 MR. SWOYER: This is Bruce Swoyer.

24 Both course routes have cracking on the  
25 horizontal welds. We have done plant-specific

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1 analysis on that cracking in accordance with the BWR  
2 VIP requirements and have established an inspection  
3 program again in accordance with the BWR VIP and the  
4 calculations.

5 CHAIR SHACK: Okay. How extensive is that  
6 cracking?

7 MR. SWOYER: The most extensive crack is  
8 in Unit 1, the H4, the midline. If you want to put  
9 that so everyone can see the --

10 MR. FLYTE: We have a slide here that  
11 shows the profile of the shroud.

12 MR. SWOYER: Right. Mid H4 Unit 1, the  
13 average crack is .6 inches. Our shroud is 2 inches  
14 thick.

15 CHAIR SHACK: And how long is it?

16 MR. SWOYER: It's approximately 60 percent  
17 around the circumference.

18 CHAIR SHACK: Big.

19 MR. SWOYER: Yes, sir.

20 CHAIR SHACK: I presume that was there  
21 before the hydrogen water chemistry was implemented.

22 MR. SWOYER: That is correct, sir, and in  
23 2000 just prior to our initiating hydrogen water  
24 chemistry, we had done an inspection on that  
25 particular weld in Unit 1 and at that time, the

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1 average crack depth was .5 and in 2004, we inspected  
2 it again and the crack depth went up to .6 and we will  
3 be doing an inspection again in 2010 on that weld.

4 CHAIR SHACK: Now, did you notice any  
5 differences in extension of the crack?

6 MR. SWOYER: The crack did grow, but  
7 again, the extension wasn't as great as it had been  
8 before hydrogen water chemistry.

9 But, again, in my opinion, the extension  
10 is more due to the cold work that was applied to the  
11 shroud. It's the depth that I think that the hydrogen  
12 water chemistry is affecting. The BWR VIP, of course,  
13 is utilizing some of that information at this time.

14 MR. BARTON: Have you applied any  
15 modifications to the shroud?

16 MR. SWOYER: No, we have not.

17 MR. BARTON: To the cracking? So, the  
18 shroud is as originally installed?

19 MR. SWOYER: That is correct.

20 MR. BARTON: Okay.

21 CHAIR SHACK: You've also done relatively  
22 little to the piping in this plant. Right? Compared  
23 to most BWRs.

24 MR. SWOYER: I'm not sure what you --

25 CHAIR SHACK: The recirculation piping.

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1 MR. SWOYER: Well, originally, we replaced  
2 the safe ends and we have also done stress improvement  
3 on the recirc piping. We have done stress improvement  
4 on all the stainless steel and all the DM welds in the  
5 recirc system and other systems.

6 CHAIR SHACK: Okay. My generic letter --  
7 does the stress improvement in the hydrogen water  
8 chemistry get you out of the augmented inspection?

9 MR. SWOYER: We continue to do augmented  
10 inspection, but we have gone to risk-informed and  
11 we've -- we've basically complied with VIP 75.

12 CHAIR SHACK: Okay. That's your two  
13 mitigating measures then. Is it the stress  
14 improvement and the hydrogen water chemistry.

15 MR. SWOYER: You are correct. Yes.

16 CHAIR SHACK: And you've -- what kind of  
17 cracking do you have in the recirc piping itself?

18 MR. SWOYER: We had two instances of  
19 cracking in the recirc piping in Unit 1. We had the  
20 N1 nozzle, the 26 inch and also one in one of the 12  
21 inch and we weld overlays on those two and we've done  
22 PDI inspection on every single weld in Unit 1 that is  
23 a -- what we call Category C from Generic Letter 8801  
24 and in Unit 2, we plan on doing the remaining welds  
25 this particular outage.

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1 MR. BARTON: Have you done inspection of  
2 the top guide in the --

3 MR. SWOYER: Yes, we have. Yes, we've --  
4 when it is available during the outage and they're  
5 looking at the guide tubes, we go in and do a visual  
6 inspection on the top guide.

7 MR. BARTON: Have you found any evidence  
8 of cracking?

9 MR. SWOYER: Not so far, sir.

10 MR. BARTON: Not so far.

11 CHAIR SHACK: Now, what's the difference  
12 in fluence between the top guide and the core shroud,  
13 the H4?

14 MR. SWOYER: Difference in fluence, well,  
15 the top guide has the highest amount of fluence.

16 CHAIR SHACK: Is it a factor of --

17 MR. SWOYER: The top guide, we had taken  
18 samples of the top guide for the BWR VIP back in 2003  
19 and one of the samples had hit one time sense of 21st.  
20 Yes, sir, and that's above what the core shroud is.

21 CHAIR SHACK: Now, one of these top  
22 guides, it's made up of the interlocking pieces or is  
23 this a one piece?

24 MR. SWOYER: No, sir, it's an interlocking  
25 piece.

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1 CHAIR SHACK: It's interlocking.

2 MR. SWOYER: Yes, sir.

3 MEMBER BONACA: I have a question relating  
4 to the LRA. You did refer to the LRA reflected in  
5 staffing a few years ago. Reflected in the plant  
6 history prior to the power uprate. Okay.

7 The question I have is that are you going  
8 to look at your problems and commitments and how they  
9 fit now at the higher power level? For example, the  
10 corrosion. You might expect that there will be some  
11 impact by the power operators and piping.

12 How do you deal with that? I mean do you  
13 have it reflected already in your LRA commitments or  
14 do you have to make an adjustment or --

15 MR. FLYTE: Bruce, can you speak to what  
16 we've -- no, we're done with -- the FAC program is --  
17 done anything for EPU? Have we changed the FAC  
18 program?

19 MEMBER BONACA: Just an example.

20 MR. FLYTE: Yes, it's a good one to  
21 follow. Have we made any specific changes for EPU to  
22 the FAC program that you're aware of?

23 MR. SWOYER: Well, this is Bruce Swoyer.

24 We have evaluated the effect of EPU on the  
25 FAC program. In some cases, there's increases. Other

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1 cases, there has been decreases in the impact on FAC.

2 MEMBER BONACA: So, what you're telling me  
3 we are talking -- for that issue, have you performed  
4 a thorough review of programs that you have presented  
5 us?

6 MR. KRAIS: Yes, the programs for license  
7 renewal do take into account the extended power uprate  
8 and higher power levels. All the evaluations done  
9 here, license renewal work done at the EPU conditions.  
10 That's one of the things we touched on earlier. Both  
11 projects were done within the same group so that they  
12 could be integrated.

13 MEMBER BONACA: Although, I mean your  
14 history -- your data is based on operation at a lower  
15 level. So, you have to --

16 MR. KRAIS: That's correct.

17 MEMBER BONACA: -- assume issues and  
18 project.

19 MR. FLYTE: We do have a additional  
20 commitment that we've added to our commitment list to  
21 really look at operating experience at extended power  
22 operating conditions in the future to -- to see if  
23 anything else pops out before we enter the period of  
24 extended operation. So, that is kind of a safeguard  
25 in that area.

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1 MEMBER BONACA: Okay.

2 MEMBER ABDEL-KHALIK: Could you tell us  
3 about the nature of the OPRM modifications that you  
4 were making?

5 MR. KRAIS: Basically, the OPRM  
6 modifications, we upgraded from the original design to  
7 a digital NUMAC system from General Electric.

8 MEMBER ABDEL-KHALIK: What motivated the  
9 modification?

10 MR. D'ANGELO: Obsolescence.

11 CHAIR SHACK: Okay. It wasn't something  
12 you needed for the power uprate?

13 MR. WILLIAMS: This is Jim Williams. I'm  
14 with PPL Susquehanna.

15 We had to go to digital OPRMs in order to  
16 implement ARTS MELLLA. So, that's what precipitated  
17 going to the GE NUMAC for OPRMs.

18 MEMBER ARMIJO: I have a couple of  
19 questions on your hydrogen water chemistry. If I  
20 recall from the EPU reviews, you intended to increase  
21 the amount -- the hydrogen input to be -- to account  
22 for the increase in power. Is that correct and are  
23 you doing that?

24 MR. D'ANGELO: Yes.

25 MEMBER ARMIJO: That is correct. Okay.

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1 The other thing is since you've instituted hydrogen  
2 water chemistry, have you found any new cracks in any  
3 of your core internals or piping? Not extension of  
4 existing cracks, but anything new to be --

5 MR. SWOYER: This is Bruce Swoyer.

6 No, we have not. Again, the only real  
7 area that we have cracks in as far as internals go are  
8 the shroud and we have not found -- to date, we have  
9 not found additional crack.

10 MEMBER ARMIJO: Thank you.

11 CHAIR SHACK: Now, you don't use the noble  
12 metal editions because you have enough shielding in  
13 your turbine building that shine doesn't bother you.  
14 Is that basically the situation?

15 MR. PAGODIN: Yes, that's basically  
16 correct. We operate at a moderate hydrogen injection  
17 rate and, you know, we've analyzed all the radiation  
18 levels on the plant both at the pre-EPU conditions and  
19 at full EPU conditions. We continue to monitor that  
20 and they are all acceptable for continued operation.

21 MEMBER ARMIJO: You also have electrical  
22 chemical potential probes in these plants. Do you  
23 monitor that or just the hydrogen input?

24 MR. PAGODIN: Yes, we have installed those  
25 probes several times. We did it again as part of our

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1 EPU project and we will be putting it -- in the  
2 future, we've be putting additional probes in. They  
3 don't last very long.

4 MEMBER ARMIJO: Yes, I know that's the  
5 problem.

6 MR. PAGODIN: So, we don't have them in  
7 there continuously, but we've put them in at various  
8 times throughout the power uprate as well.

9 MEMBER ARMIJO: Okay. Just spot check as  
10 things are --

11 MR. PAGODIN: That's correct.

12 MEMBER ARMIJO: Okay.

13 CHAIR SHACK: Okay. Where are the probes?

14 MR. WILLIAMS: This is Jim Williams.

15 The probes are actually contained in the  
16 OPRM streams.

17 CHAIR SHACK: Okay. And what kind of  
18 potentials are you reading when they are reading?

19 MR. WILLIAMS: All right. You're beyond  
20 my area of expertise.

21 MR. SWOYER: This is Bruce Swoyer.

22 I have seen data from chemistry that we  
23 can get -- they have gotten down to minus 500, but we  
24 track it. Again, I don't have the data from the  
25 chemistry exactly what -- how it tracks through the

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1 vessel, but based in the lower portion of the vessel,  
2 they can get down to minus 500.

3 CHAIR SHACK: But, you can move those  
4 things in the stream up and down. Right? No?

5 MR. PAGODIN: They're fixed. Basically,  
6 you've replaced one of our LPRM strings with the  
7 probe.

8 MR. BARTON: A couple of questions on the  
9 responses to BWR VIPs. In your response to VIP 38,  
10 the shroud support inspection contains action items  
11 that you mention that you were -- in this -- in your  
12 response here, you mention that the program includes  
13 actions planned to inspect welds that are  
14 inaccessible. Those always kind of interest me.

15 The same comment on VIP 41, jet pump  
16 assembly inspection and flow evaluation. Again, your  
17 response to this is that you're going to do  
18 inspections to welds that are presently inaccessible.

19 So, my question is how do you plan to do  
20 your commitments on inaccessible weld inspections?

21 MR. FLYTE: Bruce has the magic on that I  
22 think.

23 MR. BARTON: I always knew there was  
24 somebody that could answer that.

25 MR. SWOYER: As far as VIP 38, that's for

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1 the shroud supports. There are two welds down there,  
2 H9 and H8 and they are inaccessible. The bottom half  
3 of those welds, of course, are inaccessible. We have  
4 done UT from the outside of the vessel. GE -- using  
5 GE GERIS and Southwest Research has also done that to  
6 look at the H8 which is on the inside welded to the  
7 shroud. So, we have done UT and done full inspection  
8 on those welds.

9 As far as the jet pump welds, that's the  
10 thermal sleeve welds and no, we have no inspected  
11 those. We are very involved in the BWR VIP and the  
12 BWR VIP is attempting to establish a program for that.  
13 Either -- I know that there have been inspection  
14 groups that have tried to get smaller transducers to  
15 get down in there and also the BWR VIP is trying other  
16 methods like risk methods to determine how to resolve  
17 that problem. But, we will be following the BWR VIP  
18 as --

19 MR. BARTON: You're done the shroud and  
20 you're still working the jet pump?

21 MR. SWOYER: Excuse me, sir.

22 MR. BARTON: You've done the shroud, but  
23 you're still working on the jet pump? A program for  
24 that.

25 MR. SWOYER: That is correct.

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1 MR. BARTON: Thank you.

2 CHAIR SHACK: Can you get back to that  
3 shroud inspection again? Can you put that shroud  
4 diagram back up? On whether it's got those --

5 MR. SWOYER: Yes, there's H9 and H8 at the  
6 bottom there. The vessel wall. I should get closer  
7 to the mike.

8 CHAIR SHACK: So, you're inspecting those  
9 from the outside?

10 MR. SWOYER: Outside. Yes, sir.

11 MR. BARTON: It's interesting

12 MEMBER SIEBER: You can do it.

13 MR. SWOYER: Oh, yes, sir.

14 CHAIR SHACK: How do you qualify that  
15 technique?

16 MR. SWOYER: It is qualified.

17 CHAIR SHACK: Is it qualified?

18 MR. SWOYER: Yes, sir.

19 CHAIR SHACK: An ASME performance  
20 demonstration or your own kind of home blue  
21 qualification?

22 MR. SWOYER: It would have to be a BWR  
23 VIP. Yes, sir, demonstration.

24 CHAIR SHACK: Okay.

25 MEMBER ABDEL-KHALIK: What is the root

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1 cause for the turbine moisture separator vane damage?

2 MR. KRAIS: The cause of the turbine  
3 moisture separate vane damage is basically some  
4 spacers in between the various vanes that over a  
5 period of time have degraded causing the vanes to  
6 either shift one direction or another and that was --  
7 we chose to replace our vanes as opposed to do  
8 temporary repairs on those spacers and that could  
9 increase performance as well as to repair the damage  
10 that we've observed?

11 MEMBER ABDEL-KHALIK: And what is the  
12 nature of the damage?

13 MR. KRAIS: Erosion and degradation of the  
14 spacers between the vanes themselves.

15 MEMBER SIEBER: Did you replace them with  
16 like kind design and materials or did you --

17 MR. KRAIS: Upgrade materials.

18 MEMBER SIEBER: Upgrade?

19 MR. KRAIS: Yes, upgrade design --

20 MEMBER SIEBER: What's upgrade consist of?

21 MR. KRAIS: The primary upgrade was in the  
22 design of the vanes themselves. Double-pockets versus  
23 single-pocket vanes.

24 MR. FLYTE: In summary for our  
25 presentation, I would just like to say that our

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1 license renewal team has prepared a license renewal  
2 application that conforms to the regulatory  
3 requirements, the extensive use of established  
4 industry guidance and we had a team that was actively  
5 involved with industry activities and the bottom line  
6 for us is that Susquehanna is ready to and will manage  
7 aging in the period extended operation.

8 MEMBER STETKAR: I'd like to -- you know,  
9 the penalty you pay for getting through your  
10 presentation really fast is that we have time.

11 I'd love to follow up on -- on us -- I'm  
12 sitting here trying to think in real time. The  
13 question I asked initially and I wanted -- I didn't  
14 want to spend too much time on it so that everybody  
15 could get through the other issues that might have  
16 been more -- of more interest, but the turbine  
17 building scoping regarding those HPCI cables that I  
18 asked about, unfortunately, the only information that  
19 I have is a paragraph in the inspection report that  
20 makes a reference to the engineering evaluation you  
21 performed and it didn't identify the function of the  
22 cable. So, I know now they're related to transfer  
23 from -- you normally take a section from the  
24 condensate storage tank, right, on HPCI?

25 You said that you -- if I made my notes

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1 correct here, you did -- you concluded that, if I  
2 understand it, the -- you did -- the only impact on  
3 those cables would be from a high-energy line break,  
4 but that those cables are not required for those  
5 particular high-energy line break events. Is that my  
6 correct understanding of the conclusions?

7 And if I'm not correct, I need to get my  
8 understanding corrected.

9 MR. FLYTE: Yes, that's correct. That's  
10 my understanding as well. So, I -- Jim, can you offer  
11 any --

12 MEMBER STETKAR: High energy -- because  
13 HPCI is kind of important for high-pressure makeup and  
14 if you have a high-energy line break in the turbine  
15 building, it's quite like you're going to lose  
16 feedwater condensate or something like that which HPCI  
17 tends to be relatively important for. So, I'm kind of  
18 curious about that rationale.

19 MR. WILLIAMS: Yes, this is James Williams  
20 again.

21 The conduit and cabling that you're  
22 talking about is the HPCI CST suction swapover from  
23 the CST to the suppression pool.

24 MEMBER STETKAR: Right.

25 MR. WILLIAMS: The analyses that they

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1 performed, the high-energy line break is the situation  
2 that would affect this conduit and cabling and a high-  
3 energy break line in the turbine building is not going  
4 to affect those cables to achieve safe shutdown  
5 following a high-energy line break.

6 We would lose feedwater in that case, but  
7 HPCI would still be available. HPCI and RCIC.

8 MEMBER STETKAR: Until CST is drained. At  
9 which point, you have to swapover for long-term  
10 cooling to -- unless you somehow cool down and  
11 depressurize and --

12 MR. WILLIAMS: That's correct. It still  
13 can be performed manually.

14 MEMBER STETKAR: These are things like  
15 level-sensing cables or is --

16 MR. WILLIAMS: Yes, it's a low CST level-  
17 sensing cable.

18 MEMBER STETKAR: Okay.

19 MR. WILLIAMS: There's 135,000 gallons  
20 reserved in the CST for HPCI operation.

21 MEMBER STETKAR: Yes, that's fine, but  
22 eventually, you run out of water.

23 MR. WILLIAMS: Um-hum. But, at that time,  
24 our emergency operating procedures required us on the  
25 high-suppression pool level which -- what would

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1 happen, you'd take a suction of CST water. It would  
2 eventually raise the level in the suppression pool.

3 MEMBER STETKAR: Right.

4 MR. WILLIAMS: And our emergency operating  
5 procedures require us to transfer over to the  
6 suppression pool.

7 MEMBER STETKAR: And you still do that  
8 manually?

9 MR. WILLIAMS: Correct.

10 MEMBER STETKAR: Do these cables if  
11 they're the level-sensing cables also provide level  
12 indication CST in the main control room?

13 MR. WILLIAMS: Not those particular  
14 cables. These particular cables are strictly the  
15 level switches. It's not the level indication. We  
16 still have zero to 100 percent level indication.

17 MEMBER STETKAR: And you mentioned this is  
18 only in Unit 2 turbine building?

19 MR. WILLIAMS: That is correct.

20 MEMBER STETKAR: It's --

21 MR. WILLIAMS: Only in the 2.

22 MEMBER STETKAR: So, it only affects Unit  
23 2?

24 MR. WILLIAMS: Correct.

25 MEMBER STETKAR: The cables are routed

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1 differently in Unit 1.

2 MR. WILLIAMS: Correct.

3 MR. PAGODIN: Phil, do you have something?

4 MR. BRADY: Yes, I can -- again, this is  
5 Phil Brady.

6 The cables we're talking about on the Unit  
7 2 side is because of the CST location the cable  
8 routing does through. It's down in the basement of  
9 the turbine building and it's very short, the area  
10 where it comes out of the location of the CST and then  
11 goes into our reactor building. So, it's a very short  
12 distance. It's down in the lower elevation of the  
13 turbine building not near a lot of our high-energy  
14 lines that are in the turbine building location-wise.  
15 So, part of that analysis included the location  
16 analysis to assure that the high-energy line break  
17 was, in fact, not going to be an impact. Okay.

18 On the Unit 2 side, the reason that's not  
19 an issue is the cables actually come out of the CST  
20 area on the Unit 1, go through our diesel generator  
21 which are safety related and then use the manhole  
22 system in front of the diesel generator building as  
23 the route back into the building. So, it avoids this  
24 route into the turbine building on Unit 1 side because  
25 of the location of the diesel generators and safety-

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1 related routing.

2 MEMBER STETKAR: Okay. Thanks. At least,  
3 I understand a little bit better.

4 MEMBER SIEBER: Are these your duct lines  
5 or are they in trays or duct line?

6 MR. BRADY: No, it's all in conduit.  
7 These particular ones are routed strictly in conduit.

8 CHAIR SHACK: As John said, we seemed to  
9 be ahead of schedule.

10 MR. BARTON: I got a question. You have  
11 several tanks onsite whose bottoms rest on oil-sand  
12 pads. Now, what's your inspection program for these  
13 bottoms? I know some of these tanks with oil-sand  
14 pads do fail.

15 MR. FLYTE: Mitch, can you address that  
16 question?

17 MR. MCFARLAND: Yes. This is Mitch  
18 McFarland with the Washington Oil Team.

19 The inspection is the condensate storage  
20 and refueling water tank inspection which is a one-  
21 time inspection that will perform UTs on the bottoms  
22 of the tanks.

23 MR. BARTON: Have you done an inspection  
24 yet?

25 MR. MCFARLAND: No.

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1 MEMBER SIEBER: They're carbon steel  
2 tanks? Carbon steel.

3 MR. MCFARLAND: I believe they are. Yes.

4 MEMBER BONACA: Since I have -- have a  
5 little time, I wanted to ask a question. With  
6 inaccessible locations, you know, the inspections are  
7 relying on BWR or VIP program. It would be a big  
8 problem to discover that they really haven't got a  
9 solution yet. So, you know, who have been in license  
10 renewal for a long time as we have been, we're still  
11 waiting to see when a solution will come and this will  
12 be over the 60 years of the plant or after that and if  
13 you don't, for those progress that is being made.

14 MR. FLYTE: Bruce is going to take a shot  
15 at that, but I don't think we have much of a --

16 MR. SWOYER: Yes, Bruce Swoyer. Yes, I am  
17 a representative for Susquehanna on the BWR VIP  
18 Assessment Committee.

19 And, you know, the Assessment Committee  
20 and the BWR VIP is trying to be very proactive and  
21 resolve these issues. These aren't issues that we  
22 take lightly. So, the industry since Susquehanna is  
23 not alone, for example, like on the jet pump thermal  
24 sleeve lack of inspection, inaccessibility, all the --  
25 most all of the BWRs are in that realm. So,

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1 therefore, it behooves us to try and resolve that  
2 problem as soon as possible. So, I know for a fact we  
3 are working on that at this time.

4 MEMBER BONACA: But, you don't have any  
5 sense of when?

6 MR. SWOYER: No, sir.

7 MEMBER BONACA: It is --

8 MR. SWOYER: I mean it's being worked on.  
9 All I can tell you is we've had some success. We had  
10 -- we have inaccessible inspection areas in the core  
11 spray system for the BWR and the BWR VIP has just  
12 issued an NRC-approved resolution to that based on  
13 risk. So, that is -- at least, that is a success and  
14 we hopefully may be following on that path for some of  
15 the other areas that are inaccessible.

16 MEMBER BONACA: Thank you.

17 MR. SWOYER: You're welcome.

18 MEMBER ABDEL-KHALIK: Have the data from  
19 the steam dryer instrumentation already been compared  
20 against the model predictions for the first step?

21 MR. KRAIS: That is correct. We have done  
22 that comparison and it has been submitted per our EPU  
23 license conditions to --

24 MEMBER ABDEL-KHALIK: And how does that  
25 comparison looked?

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1 MR. KRAIS: The comparison shows that the  
2 assumptions made in the licensing for EPU was  
3 conservative compared to the actual data that we saw.  
4 So, our under-prediction factor in the licensing basis  
5 is slightly higher than what it was actually after the  
6 data comparisons were completed. Which means our  
7 licensing basis was conservative.

8 CHAIR SHACK: Any other questions? Well,  
9 I think we're on break until 10:35 since we don't want  
10 to get ahead of schedule.

11 MR. BARTON: Thank you, Mr. Chairman.

12 (Whereupon, at 9:41 a.m., off the record  
13 until 10:33 a.m.)

14 CHAIR SHACK: We can come back into  
15 session. I think Brian Holian will introduce the  
16 staff presentation.

17 MR. HOLIAN: Well, good. Thank you.  
18 Introducing the staff presentation, I just had a  
19 couple of other comments.

20 Two additional introductions, one joining  
21 us at the side table here is Dr. Sam Li, the Deputy  
22 Director for License Renewal. Wanted to recognize him  
23 and also at the front table assisting Evelyn a little  
24 bit with slides and also in the staff presentation  
25 some or in questions is Senior Project Manager for

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1 TMI, who you'll hear from this afternoon, Jay  
2 Robinson. So, he's up helping also.

3 I had one comment from this morning's  
4 presentation by the licensee and it affected our staff  
5 review a little bit and that was the issue of the  
6 power uprate being done kind of in parallel with or at  
7 least partially in parallel with the license renewal  
8 application.

9 In general, the NRC frowns on, you know,  
10 two significant licensing actions like that coming in  
11 at the same time for the potential that, you know, the  
12 licensing basis, one, be confused and the SER write-  
13 ups for the two-year period where we're writing up an  
14 SER and even the applications themselves, the licensee  
15 either putting it -- the power uprate assumptions in  
16 license renewal or not in.

17 So, plants have approached us before.  
18 We've told them, you know, we don't say it's  
19 impossible, but we frown against it just to make sure  
20 that, you know, the reviews can go on and that one  
21 review even the timing of that is not dependent on the  
22 other one.

23 So, I do appreciate the committee's  
24 comments and questions on that and making sure that,  
25 you know, one, especially the operating experience

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1 they have for the extended power uprate is reflected  
2 in the license renewal application and that was an  
3 item that the staff recognized.

4 We actually did work with the licensee and  
5 put, as they mentioned, their license renewal  
6 application on hold for several months and the staff  
7 -- the technical staff concentrated on the extended  
8 power uprate.

9 I mention that for a couple of reasons.  
10 One, it worked out well in Susquehanna's case and it's  
11 also something the committee will see again. I know  
12 Crystal River's in for an application right now for  
13 both and the industry, themselves, have learned a  
14 little bit from that on staging it so that they can  
15 clearly put the assumptions in for power uprate into  
16 the license renewal application. So, I just wanted to  
17 highlight that.

18 With that, I'll turn it over to Evelyn  
19 Gettys.

20 MS. GETTYS: Good morning. My name is  
21 Evelyn Gettys and I'm the Safety Project Manager for  
22 the Susquehanna Electric Station Units 1 and 2, the  
23 license renewal application.

24 I will begin by providing an overview of  
25 the LRA and the staff's view. We will discuss section

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1 of the SER. Glenn Meyer will discuss the license  
2 renewal inspection and the finding and then we will  
3 discuss the staff's review of section 3 and 4.

4 The license renewal application was  
5 submitted by letter dated September the 13th, 2006.  
6 Both units are BWRs with a Mark II containment. Both  
7 the extended power uprate and the license renewal  
8 application were submitted to the NRC around the same  
9 time. The LRA considered the EPU power level.

10 The operating license expires in the year  
11 2002, excuse me, 2022 and 2024 for the respective  
12 units.

13 The plant is located near the town of  
14 Berwick, Pennsylvania.

15 The staff issued the SER with open items  
16 in March 2009. The staff issued 278 RAIs. The  
17 applicant has 59 commitments.

18 CHAIR SHACK: Isn't their commitment 60?

19 MS. GETTYS: Yes, that's true. It's 60,  
20 but as I'll explain later, one was removed.

21 CHAIR SHACK: Oh.

22 MS. GETTYS: The slide shows the schedules  
23 for the audits and the regional inspections that  
24 occurred during the review.

25 As a result of the staff's review,

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1 additional piping was brought into scope according to  
2 (a)(2). Therefore, the applicant amended the LRA to  
3 include portions of non-safety related piping attached  
4 to safety related system structures and components  
5 located within containment and non-safety related  
6 piping attached to safety-related systems, structures  
7 and components at the containment penetration and  
8 extending outside of the containment in accordance  
9 with 10 CFR 54.4(a).

10 Based on the review of the LRA and  
11 additional information submitted as a result of the  
12 request for additional information, the staff  
13 concluded that the applicant's methodology is  
14 consistent with the requirements.

15 The staff did not find any omissions of  
16 systems or structures in the scope of license renewal  
17 in accordance with 10 CFR 54.4.

18 In section 2.3 of the SER which documents  
19 the staff's review of the scoping and screening  
20 results of the mechanical systems, the staff concluded  
21 that based on its review of the LRA and additional  
22 information submitted as a result of the RAIs, that  
23 there were no omissions of the structures or  
24 structures components from the scope of license  
25 renewal in accordance with 10 CFR 54.4(a) and no

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1 omissions from the Aging Management Review in  
2 accordance to 10 CFR 54.21(a)(1).

3 In section 2.4 of the SER which documents  
4 that staff's review of the scoping and screening  
5 results for structures, the staff concluded that based  
6 on its review that there were no omissions of the  
7 structures or structure components for this license  
8 renewal in accordance to the regulations.

9 Section 2.5, the electrical system, as a  
10 result of the staff's review, the applicant added  
11 sections of the offsite switchyard to the scope of  
12 license renewal for the station blackout in accordance  
13 to 10 CFR 54.4(a)(3).

14 With the inclusion of the sections of the  
15 offsite switchyard and based on the review of the LRA  
16 and additional information submitted as a result of  
17 the RAIs, the staff concluded that there were no  
18 omissions of electrical and instrumentations and  
19 control system components from the scope of license  
20 renewal and no omissions from the AMRs in accordance  
21 with the regulations.

22 Overall for section 2 of the SER, the  
23 staff concluded that the applicant's scoping and  
24 screening methodologies is consistent with the  
25 requirements of the regulations and that --

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1 CHAIR SHACK: Let me interrupt for a  
2 second. Has the staff gone back and looked at the  
3 earlier license renewals in terms of the SBO? Have  
4 you changed the rules in the middle of the game here?  
5 Did somebody get through?

6 MS. GETTYS: Yes.

7 MR. HOLIAN: Yes, the -- in general, the  
8 -- and we've covered this at a couple ACRS meetings.  
9 We put out a revised Draft Regulatory Issue Summary  
10 that clarified the wording the station blackout issue  
11 that we had. The guidance we had originally.

12 The guidance originally said typically you  
13 would go out to the switchyard breakers. That was the  
14 previous guidance.

15 It was put out last year, a Draft RIS to  
16 define that a little bit better because of some of the  
17 plants were coming up with issues and gee, that's not  
18 typical for us and making those arguments and our  
19 electrical branch in particular as they review the  
20 station blackout rule felt it important that you get  
21 out to the switchyard and station voltage as they  
22 deemed it.

23 As I discussed really at Indian Point  
24 which we covered last month, they had an open item on  
25 this issue and our latest guidance is still to look at

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1 that revised RIS and it's most probable that the staff  
2 has extended our interpretation of the station  
3 blackout rule and getting the station voltage further  
4 that we should have. So, we'll probably go back to  
5 the RIS that's out there currently which is typically  
6 get to there, but a licensee can define what's in  
7 their current licensing basis and, you know, how they  
8 can cope with the station blackout.

9 CHAIR SHACK: But, I mean specifically  
10 except for Calvert Cliffs, have you gone back and --

11 MR. HOLIAN: Yes, we've gone back. The  
12 electrical branch has gone back on -- out of the 51  
13 plants, about 40 of them get out to the switchyard  
14 breaker. So, we've looked at that and a few plants in  
15 there and during the review process did not. They had  
16 reasons why. The staff right now is still looking at  
17 whether it's worthwhile to go back.

18 If we were to go back on those, it would  
19 probably be through the backfit provisions unless they  
20 voluntarily decided to scope into the switchyard  
21 breakers.

22 MEMBER STETKAR: Brian, since --

23 MR. HOLIAN: Yes.

24 MEMBER STETKAR: -- Bill brought it up and  
25 on Indian Point there was a discussion about

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1 transmission voltage versus not. I noticed on  
2 Susquehanna that they've taken one of the paths out to  
3 the low side transformer breaker which is not  
4 "transmission system" voltage, but that's -- just to  
5 keep --

6 MR. HOLIAN: Right.

7 MEMBER STETKAR: -- the target, that's  
8 okay now.

9 MR. HOLIAN: That's okay now.

10 MEMBER STETKAR: Okay.

11 MR. HOLIAN: That's right. That's okay  
12 now.

13 MEMBER STETKAR: Just -- just to keep the  
14 target --

15 MR. HOLIAN: The target would be -- that  
16 would meet the current RIS that is out there.

17 MEMBER STETKAR: Okay. And certainly  
18 circuit breakers.

19 MR. HOLIAN: That's right and it meets  
20 their licensing basis that they were licensed for.  
21 That's right. Which in some ways the industry, you  
22 know, told us that by an NEI letter about a year ago.  
23 Staff, you're basically trying to extend, you know,  
24 the boundary for a few plants.

25 For most plants, I think it wasn't an

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1 issue because either their licensing basis had it in  
2 there to the switchyard which is not always clear.  
3 But, it either had it in there or it was an easy item  
4 for most plants. Hey, we'll go there. There have  
5 been some failures of some of the components of the  
6 phases and some of the switchyard breakers. So, even  
7 the plants themselves under the maintenance rule will  
8 have that scoped in and it's not an issue.

9 So, that's while you'll still see some  
10 plants here coming through and --

11 MEMBER STETKAR: The question is it a  
12 breaker or a disconnect, you know. I think we're  
13 settled on an active breaker and this one, you know,  
14 then it doesn't need to be transmission voltage  
15 whatever that is or low-side breakers. Okay.

16 MR. HOLIAN: That's right. That's right.

17 MEMBER STETKAR: Okay.

18 MS. GETTYS: Thank you. Overall for  
19 section 2 of the SER, the staff concluded that the  
20 applicant's scoping and screening methodology was  
21 consistent with the requirements of the regulations  
22 and that there was no omissions from the scope and  
23 screening review in accordance with 10 CFR 54(a) and  
24 there were no omissions from the aging management  
25 review in accordance to 10 CFR 54.

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1                   This is really bothering me. This  
2 feedback. Sorry. Better.

3                   I'm now going to turn it over to Glenn  
4 Meyer.

5                   MEMBER STETKAR: Evelyn, let me ask you  
6 one question before Glenn comes up. I've had too much  
7 time to think on the break.

8                   Back to my HPCI cables. It's a scoping  
9 and screening, you know, 54(a) tool or whatever it is.  
10 One, and this is mostly for my education, when the  
11 applicant and you consider whether or not something is  
12 potentially in scope, is there some consideration of  
13 failure modes and effects?

14                   For example, if I cut a cable, I cannot  
15 transmit electricity through it and that's one failure  
16 mode. If I short the cable, I might get a spurious  
17 signal. So, for example, are those two failure modes  
18 considered when you think about possible affects from  
19 interactions?

20                   MS. GETTYS: That's a good --

21                   MEMBER STETKAR: So, for example, these  
22 cables, if they're level-sensing cables, could a  
23 shortcircuit -- could some sort of interaction cause  
24 a shortcircuit to the -- closes the CST suction valve?  
25 Which, for example, if suppression pool level was

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1 normal, would cavitate the HPCI pump which is not a  
2 good thing to do.

3 Do you think to that level of detail and  
4 is the applicant suppose to do that? I don't know if  
5 these particular cables can do that, but I'm trying to  
6 get in my own mind the types of thought process that  
7 goes into determining whether something is in scope or  
8 out of scope especially with the -- you know, the non-  
9 safety versus safety interactions.

10 MEMBER BONACA: -- is an element.

11 MR. ROGERS: Yes, I'm Bill Rogers. I'm  
12 from the Division of License Renewal.

13 And the way the rule is set up, it's set  
14 up such that for non-safety related components if they  
15 can affect the (i), (ii), (iii) of (a)(1) which brings  
16 safety related components in the scope, if they can  
17 affect any of those three things, that would bring it  
18 -- the non-safety related features in the scope  
19 regardless of the failure mechanism. That's the  
20 conceptual approach.

21 CHAIR SHACK: But, you would consider all  
22 the failure modes that could occur in making that  
23 decision.

24 MR. ROGERS: Yes. Yes.

25 MEMBER STETKAR: Both failure to perform

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1 or spurious-type.

2 MR. ROGERS: Yes, so for (a)(2) in  
3 general, a non-safety related structure or component  
4 can be brought in the scope if its failure to function  
5 can affect one of those, the three portions of (a)(1)  
6 or if it could have a physical impact on a safety  
7 related structure or component and cause its failure.

8 MEMBER STETKAR: Um-hum.

9 MR. ROGERS: So, yes, the applicant is to  
10 consider all the failure effects and that, of course,  
11 is -- that is known effects not hypothetical effects.

12 MEMBER STETKAR: No. No. No, but --

13 MR. MEYER: From the regional -- the  
14 inspection standpoint, I would say that approach is  
15 pretty conservative. What we typically see is a  
16 spaces approach. They referred to that. So, it  
17 doesn't get to the level of failures and -- but, if  
18 it's performing some function and it is in that space,  
19 that building, that room, that whatever, that -- all  
20 the equipment in that room, building, space is in  
21 scope. This is one example where they did choose to  
22 go beyond that and do the evaluation and see was the  
23 function preserved and so --

24 MEMBER STETKAR: And that's why --

25 MR. MEYER: Right.

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1 MEMBER STETKAR: -- I brought it up.  
2 Because the function that they looked at is failure to  
3 transfer when required. I didn't hear and I don't  
4 know if those cables, I'll probably ask the applicant  
5 here in a moment, but I was trying to get straight in  
6 my mind whether they should also consider the fact  
7 that those cables could spuriously close a valve when  
8 they're not suppose to and because they did transit  
9 past the just impact or no impact and make an argument  
10 based on a particular function and a particular  
11 response scenario and take credit for manual operator  
12 actions, they've gone past as you said most -- what  
13 most people do.

14 MR. MEYER: Right. No, and in HPCI, I  
15 think the system is typically interlocked. So, that  
16 it insists that one valve is open. If you had, I  
17 guess, for example, sure if that would tend to close  
18 one of the suction valves, it would automatically open  
19 the other. But, the controls prevent a simultaneous  
20 suction valve closure. But, those are the details  
21 that the analysis -- you would expect to have I mean.

22 MEMBER STETKAR: I think if -- we okay on  
23 time? I don't want to go forever, but if I could ask  
24 the applicant then, can failures of those level-  
25 sensing valves cause a spurious signal to close the

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1 normal condensate suction valve?

2 And basically, the, you know, spurious low  
3 level on the condensate storage tank is what I'm  
4 talking about because that would -- that would --

5 MR. BRADY: Yes, this is Phil Brady.

6 That circuitry is set up in such a way  
7 that if, in fact, the cable were to fail and, in fact,  
8 cause the valve to close from the CST, a loss of  
9 suction would be initiated in either trip HPCI off at  
10 that point or initiate the transfer operation to the  
11 suppression cooling. But, those cables themselves  
12 have been evaluated from a failure mode in each  
13 direction. Both a short, short to ground, open.

14 MEMBER STETKAR: Okay. Thanks. Thank  
15 you. Good.

16 MR. MEYER: Okay. We're ready. Okay.  
17 Good morning, Chairman Shack and ACS members. I'm  
18 Glenn Meyer. I lead the regional license renewal  
19 inspection. I'd like to briefly cover our results.

20 The inspection basically endeavors week  
21 two objectives. We do look at scoping of non-safety  
22 system, structures and components. We also look at  
23 aging management programs to evaluate their soundness.  
24 In this case, we looked at 12 new aging programs and  
25 17 existing programs.

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1                   We do use a third technique of a system  
2 review to look at the two objectives. We pick the  
3 HPCI system and so, we look at the condition of the  
4 system, the test records, take a look at the  
5 complements that are in the field to make sure that  
6 aging management programs that have been, you know,  
7 put in place will cover all the components and also  
8 get a sense of how well they're addressing the aging  
9 that's occurred thus far.

10                   MEMBER ABDEL-KHALIK: Is there any history  
11 of problems with the HPCI system at --

12                   MR. MEYER: No, what comes into play is  
13 that HPCIs can be -- because it's somewhat self-  
14 contained. Many of the systems go throughout so much  
15 of the plant that it really wouldn't be feasible to  
16 pick that system and look at test records, conditions  
17 and the aging programs that apply. So, we tend to  
18 pick -- it's not because HPCI has been a problem and  
19 it deserves the focus. But, it suits our purposes  
20 well would be one of the main reasons. So.

21                   MEMBER ABDEL-KHALIK: Would you tend to  
22 select generally an MSPI system or this just happens  
23 to be a convenient one?

24                   MR. MEYER: Yes. Yes, MSPI, the  
25 mitigation system performance index. I would tend to

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1 say yes on PWRs. Sometimes we'll look at aux  
2 feedwater. Again, self-contained safety-related non-  
3 safety -- since we're looking at scoping of non-safety  
4 components, we got to look at what's in the vicinity.  
5 Is there, you know, another drain line or demon water  
6 or something that could affect the system? So, it's  
7 a check on that.

8 But, yes, we tend to pick, you know,  
9 systems that matter that would tend to be in the MSPI.

10 MEMBER ABDEL-KHALIK: Has the indication  
11 for HPCI at Susquehanna been consistently green?

12 MR. MEYER: I can't talk to the history of  
13 HPCI at Susquehanna.

14 MR. BARTON: But, you don't always pick  
15 HPCI or aux feedwater. Do you?

16 MR. MEYER: No, sometimes we've picked a  
17 river, you know, cooling systems. There's been a  
18 variation.

19 MR. BARTON: Right. I just wonder if  
20 people know where you are beforehand. That's all. I  
21 want to make sure that they don't know what system  
22 you're going to look at in BWR and a PWR. That's the  
23 only reason.

24 MR. MEYER: Yes, and the nature of our  
25 review is, you know, if they know in advance, I don't

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1 think it compromises our review.

2 MEMBER ABDEL-KHALIK: Does the applicant  
3 have an answer to the historical status of the HPCI  
4 system?

5 MR. FILCHNER: Yes, this is Duane  
6 Filchner, Regulatory Affairs.

7 The HPCI system from an MSPI standpoint  
8 has been green since MSPI was initiated.

9 MEMBER ABDEL-KHALIK: Okay. Thank you.

10 MR. MEYER: There were a few scoping  
11 related items that we picked up during the aging  
12 management review and I'll talk to those.

13 In general, we felt that scoping of non-  
14 safety system, structures and component was generally  
15 accurate and that they had used an acceptable  
16 approach. As part of that, we did look at structural  
17 and spatial interactions.

18 Regarding the HPCI cable issue that we  
19 talked to, what the inspection found was that they had  
20 identified -- an engineer had identified there was a  
21 safety-related cable that hadn't been fully evaluated  
22 and they had put it into the corrective action  
23 program.

24 The inspection concern was that they  
25 hadn't updated their application to indicate that.

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1 So, they did amend the application to do that. I  
2 would say that the inspection report says it's in Unit  
3 1, but it's, in fact, in Unit 2. So, you know, the  
4 Unit 2 is correct and it did go out and look at the  
5 cable and they are in conduit. They are in the  
6 vicinity of the feed pumps. So, it's appropriate to  
7 consider for a high-energy line break and so --

8 MEMBER STETKAR: Is -- if I can interrupt  
9 for a moment, maybe I completely misinterpreted. The  
10 problem is we don't get -- we don't have benefit of  
11 the updates to the license renewal application or at  
12 least not immediately. We have a 2006 version. We  
13 don't have all of the supplements.

14 Are the -- well, in principle, we do. In  
15 practice, I don't --

16 MR. MEYER: Okay.

17 MEMBER STETKAR: -- right at the moment.  
18 Is now that area of the turbine building included in  
19 scope for 54.4(a)(2)? For those --

20 MR. MEYER: No.

21 MEMBER STETKAR: Okay. So --

22 MR. MEYER: No, based on their evaluation.

23 MEMBER STETKAR: So, I --

24 MR. MEYER: They were able to say that --

25 MEMBER STETKAR: Okay. Fine.

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1 MR. MEYER: -- the turbine building did  
2 not need to be in scope.

3 MEMBER STETKAR: Thanks. Sorry.

4 MR. MEYER: Okay. The aging management  
5 programs, I'll briefly describe some of the issues  
6 that we followed.

7 The first one was in the supplemental pipe  
8 and tank inspection program. Our inspectors found  
9 that the starting air tanks for the emergency diesel  
10 generators and some of the stainless steel fuel oil  
11 components had not been put into the program and the  
12 LRA was amended to include those.

13 The buried piping and tanks inspection  
14 program, we felt that their sampling for coded --  
15 coded pipes had not been as thorough as it should have  
16 been and also the way that they controlled  
17 opportunistic inspections, in other words, digging up  
18 a buried pipe for other reasons, but yet doing a  
19 thorough inspection so that it was taken credit for  
20 and documented and they amended the LRA to address  
21 those issues.

22 They also had the area-based NSAS as in  
23 non-safety effects safety inspection program and in  
24 that they had sampling for the cracking of copper  
25 alloy piping, but they had a specification that would

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1 have allowed them to exclude the inspection if ammonia  
2 was determined to be absent and we felt that that was  
3 -- you know, given that aging is such a long process,  
4 that a test for ammonia was an inappropriate exclusion  
5 and they agreed to take that out and the application  
6 amended.

7 In the chemistry program effectiveness  
8 inspection, the home addressed the qualification of  
9 inspectors and they did amend the application to  
10 specify ASME coded qualifications.

11 And lastly, in the programs, the small-  
12 bore Class 1 piping inspection program. The program  
13 had referenced vibrational fatigue failures, a non-  
14 aging effect and subsequently, they did amend the  
15 application to delete that reference.

16 In the existing program that we pursued,  
17 the structures monitoring program, we found that it  
18 had been a sufficient program for the maintenance  
19 role, but that for aging management, we found that it  
20 didn't have some of the basic elements it should have  
21 in terms of acceptance criteria, inspection record  
22 retention, trending of results and inspector  
23 qualifications and they did agree that they would  
24 upgrade the program in those aspects and amended the  
25 LRA to address that.

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1           In the masonry wall program, our inspector  
2 as part of walking down the ESSW pump house determined  
3 there was a masonry wall there that had not been in  
4 the application. It had been a relatively recent  
5 modification to address security concerns and so, it  
6 hadn't been picked up. So, they amended the  
7 application to include that masonry wall.

8           In the fuel oil chemistry program, I think  
9 we made mention this morning about ultrasonic tests  
10 that they hadn't met the guidance of the GALL. So,  
11 that amended the application to do some UTs of tank  
12 bottoms and to take an exception.

13           There was a question this morning about  
14 the recent visual inspections and I checked our  
15 inspection record. We had looked at the most recent  
16 ten-year inspections and on the delta tank, that  
17 occurred in July 3rd of last year and on the alpha  
18 tank, it was in August 21st of the year prior. So, it  
19 is something that we tend to look at.

20           Piping corrosion program, the application  
21 had not addressed coatings which the aging management  
22 program had taken credit for and it also wasn't  
23 specific on opportunistic inspections and so, they  
24 amended the LRA to address that.

25           Fire water program, our inspector noted

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1 that in the fire water piping there are some parts  
2 that area infrequently wetted for testing and then  
3 drained, but they had no sampling of that. Also, many  
4 inspections of some piping we felt wasn't properly  
5 addressed. So, they amended the LRA to address  
6 sampling of such piping.

7 Instrument air monitoring, the application  
8 did not have an aging management program for  
9 instrument air. Now, they count on the quality of the  
10 air in terms of evaluating aging for components that  
11 are -- use instrument air and we felt that it was  
12 appropriate that there be some evaluation of how well  
13 that was performing if they're going to take credit  
14 for it and they amended the application to include  
15 commitment 58 to continue existing air quality  
16 monitoring.

17 System walkdown program, our inspectors  
18 noted that at the interface between buried piping and  
19 the exposed piping inside the building Susquehanna had  
20 noted in some instances they had groundwater intrusion  
21 and some corrosion at the interface. The issue in our  
22 mind was the coating that protects the pipe, it's not  
23 clear how far it comes into that building wall and  
24 given some evidence of corrosion, we were curious as  
25 to how it was going to be addressed and so, they

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1 determined that the system walkdown program was the  
2 best on to do that. They agreed they would do some UT  
3 inspections of the joint to evaluate the piping and  
4 also, as noted, we did find some pipe vaults that  
5 hadn't been inspected. They did look at the one. We  
6 came back and looked at that and that was acceptable.  
7 So, they'll do subsequent reviews of such vaults in  
8 the future.

9 Closed cooling water chemistry, their  
10 application didn't address the fact that they had  
11 plans to do one round of inspections of components  
12 addressed by closed cooling water systems versus the  
13 GALL recommended periodic monitoring. So, they  
14 amended the application to properly address that.

15 CHAIR SHACK: On the piping corrosion,  
16 there was some discussion of whether they needed  
17 coatings or whether cast iron or ductile iron without  
18 coatings. Was that an adequate treatment? Was that  
19 resolved?

20 MR. MEYER: I think from the inspection,  
21 it wasn't necessarily what was acceptable, what should  
22 be coated, but how the program addressed those two  
23 types.

24 CHAIR SHACK: Okay.

25 MR. MEYER: The HPCI/RCIC turbine casing

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1 program, we felt that the program had insufficient  
2 details. I mean they have been doing periodic  
3 maintenance and inspection, but the program itself  
4 needed some basics on the inspections, the  
5 qualifications, the acceptance criteria. They did  
6 change that in the LRA.

7 Lastly, the leak chase channel monitoring  
8 program which, you know, addresses the spent fuel pool  
9 and the cask shipping pool and looks to see what's in  
10 the chases, we felt that the needed some clarification  
11 regarding water chemistry and that was done in the  
12 application. So.

13 MEMBER STETKAR: Glenn, you do an audit of  
14 the AMPs. Right? What fraction of all of the AMPs  
15 did you actually look at?

16 MR. MEYER: I --

17 MEMBER STETKAR: Do you have a rough --

18 MR. MEYER: We typically are in the range  
19 of -- we almost always do more than half. So, it's  
20 typically a half to three-quarters of the programs.

21 MEMBER STETKAR: Okay.

22 MR. MEYER: And simply based on the fact  
23 that a lot of the existing programs are part of an  
24 ongoing inspections. So, we get a look.

25 MEMBER STETKAR: The only reason I ask

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1 that is that frankly this -- you guys do a really good  
2 job by the way.

3 MR. MEYER: Thank you.

4 MEMBER STETKAR: I really appreciate the  
5 effort that you put into these inspections.

6 This report in particular seemed to  
7 highlight a much larger fraction of AMPs where you  
8 identified a deficiency and I mean a substantive  
9 deficiency not a --

10 MR. MEYER: Um-hum.

11 MEMBER STETKAR: -- different code case  
12 and the applicant came back and basically agreed and  
13 amended the program, amended the LRA.

14 MR. MEYER: Um-hum.

15 MEMBER STETKAR: The reason I ask about  
16 the fraction that you actually looked at is because  
17 that list that you just went through is relatively  
18 long. Do you feel that there may be additional AMPs  
19 out there that you didn't audit that would have  
20 similar deficiencies that might merit a little more  
21 deep -- another audit?

22 It's kind of a leading question. It's  
23 just that the length of this list and the applicant's  
24 kind of agreement with yes, things that you found that  
25 indeed were deficiencies. They were added to the

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1 program. Standard words. Was just quite a bit more  
2 than at least I've been used to seeing in their  
3 reports.

4 MR. MEYER: Well, like I said, I can't  
5 predict the unknown or --

6 MEMBER STETKAR: Right.

7 MR. MEYER: -- what were in the other  
8 programs, but like I say, we tend to sample and you  
9 tend to skip over programs that have been existing,  
10 are part of the program. So, a lot of -- you know,  
11 ISI program, we don't look at.

12 Also, in this case, experience does matter  
13 and so --

14 MEMBER STETKAR: Okay.

15 MR. MEYER: -- we have done a number of  
16 inspections over the last two years and, you know, you  
17 learn from it and briefly, one of the inspectors had  
18 been a resident inspector at Susquehanna and, you  
19 know, he was familiar. So, those sorts of things  
20 matter.

21 MEMBER STETKAR: Okay. I'm glad you said  
22 that. So, it's -- this is not necessarily a purely  
23 random sample?

24 MR. MEYER: True.

25 MEMBER STETKAR: Okay.

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1 MR. MEYER: Also, I'll be here this  
2 afternoon talking about TMI and the list is  
3 considerably shorter.

4 MEMBER STETKAR: That's right.

5 MR. MEYER: And you know and still had  
6 it's inspectors. It's just -- so.

7 MEMBER STETKAR: Okay. Thanks.

8 MEMBER BONACA: Could you comment on the  
9 physical conditions of the plant?

10 MR. MEYER: It's not something we  
11 typically do since it's inherently subjective. But,  
12 I would give you the one measure that is fairly  
13 consistent is the structural or concrete area. The  
14 same inspector is very experienced and he does that  
15 each and every plant and, for example, at Susquehanna,  
16 he said that the condition of the structures was very  
17 good. That, you know, the aging effects are minimal  
18 and that he thought that, you know, the buildings  
19 themselves were in very good shape.

20 You know, the overall material condition  
21 is not something that we try and address. I mean it  
22 is addressed to a large extent by the maintenance rule  
23 and the MSPI indicator, but I think it was -- well,  
24 like I said, structurally, the plant's in very good  
25 shape.

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1 MR. BARTON: I noticed you addressed  
2 structurally in one report. It was either the audit  
3 report or this. I don't remember. I don't remember,  
4 but in neither report did it address the overall  
5 material condition and I think that's important  
6 because it tends to tell you what's the culture at the  
7 site, you know. The system's rusty. They got leaks  
8 or whatever or the system is well maintained and you  
9 know and you guys know your own plants. You got  
10 residents and I think you know how to assess, you  
11 know, the material condition. I mean is it --  
12 normally, you used to put words in there like it was  
13 adequate. In the last few plants I reviewed, it's not  
14 been addressed at all. So, it makes me wonder why  
15 wasn't it addressed. Because it's not adequate this  
16 time or they didn't look at it or didn't assess it.  
17 Whatever. But, I think it's important to know from  
18 the regulator's position, you know, how do you feel  
19 the overall condition of this plant is, you know, and  
20 I'm surprised it doesn't get mentioned.

21 MR. MEYER: All right. Well, I would say  
22 that we certainly try and meet our customer's need and  
23 that would be the headquarters staff and if they  
24 wanted that, we certainly could do it. My belief is  
25 that it is subjective.

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1 MR. BARTON: Sure.

2 MR. MEYER: Too many times it tends to  
3 become a measure of housekeeping. I think the MSPI  
4 that looks at, you know, the availability and  
5 reliability of systems is probably a better measure of  
6 overall condition of the materiel. So.

7 MEMBER BONACA: Yes, but for example, the  
8 containment that -- the drywell. You know, it's part  
9 -- it's still -- I believe it's still an ISG for BWRs  
10 and, you know, I would have liked to see some look at  
11 it or inspections, conclusions why it is not discussed  
12 by the applicant nor by the presentation here.

13 MR. MEYER: Okay. Our inspection looks at  
14 the records of, you know, all the various ASME  
15 inspections that they have.

16 To go on the inside and look at the liner,  
17 would merit going during the outage and it's not  
18 something we typically do unless we see indication  
19 that there are problems that merit that. Again --

20 MEMBER BONACA: And I would have liked to  
21 hear that because it had indication or et cetera --

22 MR. MEYER: Okay.

23 MEMBER BONACA: -- you know, the rest.  
24 Because I mean it is the only substantial ISG that you  
25 have for BWRs. So.

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1 MR. MEYER: It's a good note and certainly  
2 we -- if we choose not to return during an outage and  
3 look at the inside, then we'll make that clear.

4 MEMBER BONACA: All right. Thank you.

5 MEMBER BROWN: Can I interject for a  
6 minute. I'd springboard off of John's comment.

7 Well, I've known Glenn from many years ago  
8 in the Naval Nuclear Program and you talk about the  
9 subjectivity of the plant. Put aside the concrete  
10 looks good, but the subjective maintenance, appearance  
11 of the plant and the Naval Nuclear Program, I mean we  
12 walk into a submarine and we see rusty pipes, dripping  
13 water, CO gets fired. I mean I'm being pejorative.  
14 You know, there's always some gray line, but we use  
15 the subjectivity with the thought process that if  
16 you're not taking care of vacuuming the rugs and  
17 wiping the dust off of stuff or whatever it is, you  
18 may not be paying attention as much to the PMs that  
19 need to be done, the recording of information. You  
20 know, how careful are you with your tripping calc  
21 procedures and others? So, whether that's good or  
22 bad, whether it's right or wrong, it's just the way  
23 it's used.

24 MR. BARTON: But, to me, I always use it.  
25 It's a culture -- it's a culture just like --

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1 MEMBER BROWN: You walk in. You got rust  
2 and water and steam leaks and everything else. You're  
3 going to say um, geez, that's --

4 MR. BARTON: That may run good, but it's  
5 falling apart.

6 MEMBER BROWN: Yes.

7 MR. BARTON: I mean it's --

8 MEMBER BROWN: Well, and that's probably  
9 wrong. Maybe, I guess.

10 MR. BARTON: Maybe. Yes.

11 MEMBER BROWN: I'm just -- you know, it  
12 just -- I tend to agree with him that a little bit of  
13 subjectivity as long as you -- is not all that bad.  
14 So, I'll stop right there. I just --

15 MR. MEYER: Well, I will say I don't want  
16 to diminish value of an experienced inspector's  
17 ability to go various places and draw conclusions  
18 based on what that inspector sees. So, there's value  
19 in it, but it's also fraught with some risk of the  
20 subjectivity and how do you draw an overall conclusion  
21 for the plant.

22 We used to try to do that in the days when  
23 we had SALP, the Systematic Analysis of -- yes. Yes,  
24 and it didn't tend to be that useful.

25 MEMBER ARMIJO: It was terrible.

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1 MR. MEYER: Another thing worth mentioning  
2 is --

3 MEMBER BROWN: See I take advice from  
4 somebody who's --

5 MR. MEYER: A thing worth mentioning is we  
6 do have resident inspectors. Everyday they're  
7 inspecting. They're in the plant. If it's a leak,  
8 yes, I totally agree. A leak is a valid indication of  
9 a problem and they would ensure that it's been in the  
10 -- it's been put into the corrective action system or  
11 it is subsequently to address the problems.

12 So, all the specific problems get  
13 addressed, but an overall materiel condition is  
14 something like I -- well, I've said what I believe.

15 So, was there anything that --

16 MEMBER BROWN: I'm not going to say  
17 another else.

18 MR. MEYER: -- headquarters wants us to  
19 do?

20 MEMBER BROWN: An observation. That's  
21 all.

22 MR. MEYER: And serve their needs.

23 MR. BARTON: I would like to add onto  
24 Mario's comment on containment. I know you can't  
25 schedule your inspection when there's an outage, but

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1 I know the plants that I was at whenever there's an  
2 outage, the resident usually went in and did a  
3 walkdown of my containment. So, you know, what does  
4 he say about condition in containment? Maybe you  
5 didn't cover it, but the resident should know and, you  
6 know, it could be in your report. You know,  
7 containment was, you know, fine or there's paint  
8 peeling all over the liner, the liner's rusted. I  
9 mean in some of the submittals of other units, you see  
10 that comment and I know the inspectors weren't  
11 necessarily there. Your team wasn't necessarily there  
12 during an outage, but I know it's probably feedback  
13 from the resident. So, and you could cover it that  
14 way. So, I know you don't have to be there.

15 MEMBER SIEBER: Inspections have to have  
16 attributes and observations as opposed to the place is  
17 a dirty place and INPO can easily say this is a dirty  
18 place and make it stick.

19 On the other hand, an inspector going into  
20 a plant who notes housekeeping is poor, that puts him  
21 on the alert to make sure that he inspects the  
22 attributes thoroughly enough to determine what the  
23 condition of the equipment is.

24 I think based on my experience with the  
25 Regions that happens.

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1           Maybe you can tell me whether it does or  
2 to what extent, but if an inspector goes into a plant  
3 that doesn't look very good, that inspector's on the  
4 alert as soon as he gets there.

5           MR. HOLIAN: This is Brian Holian,  
6 Division Director of License Renewals and previously  
7 nine years in Region I as a manager.

8           I'd just like to comment on the issue in  
9 front of us. I will look back at some of our  
10 inspection reports and even in our prep for these  
11 sessions, we do bring up material condition and we are  
12 looking at how well it's documented in license renewal  
13 inspections or just for this subcommittee for a  
14 feeling of the condition of the plant. We do agree  
15 that it's an indicator. It might not be an indicator  
16 we measure, but it's clearly an indicator for the  
17 inspectors. We do look at INPO reports. We do look  
18 at the reviews of different inspections, maintenance  
19 rule, ISI inspections. We are in there every outage.  
20 Regional managers, in particular since Davis-Besse,  
21 but even before that, are crawling around during the  
22 outages every chance we can get. So, those  
23 observations are done.

24           There's probably a better way we can  
25 summarize some of that for the ACRS in a license

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1 renewal context for how it influence our inspection  
2 samples and other things. I'll take that.

3 MEMBER BONACA: Particularly on the  
4 drywell. As you know, it has been the focus of other  
5 review of BWRs in the past two/three years.

6 It's central to the ISG. I mean it's the  
7 main ISG issue.

8 I was startled not to find any element of  
9 a presentation here. I'm pleased to hear that it's in  
10 good shape, but, you know, thinking about what the  
11 members may like to hear in presentation, that would  
12 be probably items that I certainly would like to hear  
13 about.

14 MR. HOLIAN: And we'll take that in  
15 particular for, you know, the full committee. Thank  
16 you.

17 MR. MEYER: As a summary for my part, it  
18 was not left out for any reason. It wasn't excluded  
19 because of --

20 MR. BARTON: Well, it just kind of makes  
21 you wonder when you don't talk about it what -- you  
22 know, what is it. You know.

23 MR. MEYER: Um-hum. And as to the  
24 resident inspectors going in during the outage, the  
25 problem with that tends to be that they're most

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1 familiar with their site and since an industry  
2 standard for overall material condition is a little  
3 difficult to define, then we kind of default each  
4 inspector's standard and that really tends to be  
5 subjective. So.

6 MR. BARTON: I would hope their standards  
7 are really high.

8 MR. MEYER: Well, they may be, but their  
9 job is --

10 MR. BARTON: You're digging a deeper  
11 whole, Glenn. You can continue. I'm sorry.

12 MR. MEYER: So, as we said, we addressed  
13 aging management. We did look at the four amendments  
14 that were submitted to address these issues.

15 On the HPCI system review, we felt that  
16 aging effects had been addressed on HPCI and that the  
17 coverage of the aging management programs was  
18 appropriate for aging management --

19 MEMBER ABDEL-KHALIK: The HPCI system  
20 review involved a review of all the system health  
21 reports for the past several quarters --

22 MR. MEYER: Yes.

23 MEMBER ABDEL-KHALIK: -- and/or --

24 MR. MEYER: Yes.

25 MEMBER ABDEL-KHALIK: -- observation of

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1 the system during tests or was it just a walkdown?

2 MR. MEYER: I don't think there were tests  
3 that we were able to observe. It was walkdown of the  
4 system. We did look at the health reports because  
5 they tend to highlight any problems they've had that  
6 we would follow-up on.

7 MEMBER ABDEL-KHALIK: So, the inspector  
8 never really saw the pumps running?

9 MR. MEYER: I can't state for sure. I  
10 don't recall that -- the pumps running.

11 MEMBER ABDEL-KHALIK: Okay.

12 MR. MEYER: It's a --

13 MEMBER ABDEL-KHALIK: You would have no  
14 indication, for example, on level of vibration  
15 associated with the pump operation?

16 MR. MEYER: No, but the --

17 MEMBER ABDEL-KHALIK: You can get that  
18 from the system health reports?

19 MR. MEYER: The monthly test would  
20 certainly look at function, you know, pressure and  
21 flow and things like that, but they also do check  
22 vibration. We can see at the monitor locations the  
23 kind of vibration they've had and it would be  
24 something we would look at.

25 MEMBER ABDEL-KHALIK: And historically,

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1 there have been no problems and no obsolescence issues  
2 associated with subcomponents of the systems?

3 MR. MEYER: I can't talk to that. I don't  
4 have those details. I could get them if that's  
5 worthwhile.

6 MEMBER SIEBER: Well, pumps themselves are  
7 active components as opposed to the license renewal  
8 rule which deals with passive components.

9 MEMBER ABDEL-KHALIK: Are there any --  
10 perhaps I should direct my question to the applicant.  
11 Are there any obsolescence issues associated with  
12 subcomponents of the HPCI system?

13 MR. D'ANGELO: I think in general the  
14 station health reports on any system do address  
15 obsolescence of subcomponents required to that system.

16 Nick D'Angelo, Station Manager of  
17 Engineering.

18 In general, station health reports have a  
19 section on obsolescence and certainly in HPCI, there  
20 are components that we have an obsolescence program  
21 and are working now, you know, through a CAP process  
22 to, you know, develop suitable replacements for those.

23 To be able to answer directly is there one  
24 specific component we're, you know, concerned about  
25 right now, the answer is no. We have sufficient

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1 spares, sufficient replacements and are sufficiently  
2 ahead of any shortages we have of parts that we don't  
3 have a direct impact on station operation now.

4 That is addressed in station health.

5 MR. MEYER: On the aging management  
6 programs, we can concluded that the proposed  
7 activities are capable of managing aging effects.

8 Our inspection conclusions, we concluded  
9 that the scoping of non-safety system, structures and  
10 components and the aging management programs are  
11 acceptable. Our inspection results support a  
12 conclusion of reasonable assurance that aging effects  
13 will be managed and attendant functions will be  
14 maintained during the period of extended operation.

15 I'd also like to briefly address current  
16 performance. Both the Susquehanna units are in the  
17 Licensee Response Column of the action make-up which  
18 is the lowest level of regulatory oversight and that's  
19 based on all of our -- the inspection findings have  
20 been green and that the performance indicators are  
21 also green as shown on the slide.

22 And that concludes my remarks.

23 MS. GETTYS: Section 3 of the SER, this is  
24 the following sections. I do not plan to cover each  
25 subsection, but we'll touch on those which have

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1 information of interest.

2 Section 3.0.3 contains the staff's review  
3 of the applicant's aging management programs. There's  
4 52 AMPs that were viewed by the staff. Twenty are new  
5 programs. Thirty-two are existing programs. Twenty-  
6 eight were identified as consistent with GALL. Seven  
7 with exceptions. Eleven -- excuse me. Seven with  
8 enhancements. Eleven with exceptions and two with  
9 both enhancements and exceptions. Four were  
10 identified as plant-specific programs.

11 MEMBER BONACA: The 52 AMPs, is it the  
12 total number of AMPs or is it only the total number of  
13 AMPs reviewed by the staff?

14 MS. GETTYS: It's the total that was  
15 reviewed by the staff.

16 MEMBER BONACA: Oh, number of AMPs larger?

17 MS. GETTYS: I'm sorry.

18 MEMBER BONACA: So, the number of AMPs for  
19 this plant is larger than 52?

20 MR. ROBINSON: There are 52 AMPs and they  
21 were all reviewed by the staff.

22 MEMBER BONACA: Oh, okay. Okay.

23 MS. GETTYS: I think the next slide will  
24 help clear this up. During the staff's review, two  
25 aging management programs were added. They are the

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1 preventive maintenance activity of the main turbine.  
2 This was an existing program that Susquehanna was not  
3 taking credit for.

4 The next one that was added was the fuse  
5 holder program. It was added because the program was  
6 needed to manage aging for fuse holders.

7 The main steam flow restrictor inspection  
8 program was a new program that the plant had added for  
9 the LRA, but during the review of the AMP, it was  
10 deleted based on the GALL recommendations that the AMP  
11 was not needed.

12 MEMBER ABDEL-KHALIK: The concern there is  
13 change in flow diameter or something? What is the  
14 concern with the inspection of the main steam flow  
15 restrictor?

16 MR. BARTON: Whether the flow restrictor  
17 will grow. As age goes on, it gets larger and larger.  
18 That's the issue here.

19 MEMBER ABDEL-KHALIK: And the  
20 determination was made that over the years the flow  
21 diameter in the restrictor has not changed? Is that  
22 why it was renewed?

23 MS. GETTYS: It was that it wasn't --  
24 there were other programs that were covering aging for  
25 that. This particular program wasn't needed. It was

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1 removed by the applicant.

2 MR. BARTON: I don't remember that. I  
3 thought it said something to do with insignificant  
4 change or something that -- I don't remember.  
5 Somebody who reviewed this ought to know the answer.

6 MS. GETTYS: Erach Patel is --

7 MEMBER ABDEL-KHALIK: Could the applicant  
8 perhaps explain this?

9 MR. PATEL: Hi. I'm Erach Patel. I  
10 reviewed that program and there were three aging  
11 effects on the main stream flow restrictor. Loss of  
12 material, cracking and they had reduction of fracture  
13 toughness due to the thermal embrittlement.

14 This program was originally put in there  
15 for thermal embrittlement. When you look at the GALL  
16 embrittlement AMPN 12, it provides a screening  
17 criteria which says that if the material is  
18 centrifugally cast there might have been material, but  
19 then you don't have this aging effect of thermal  
20 embrittlement and based on that, that program was not  
21 required.

22 But, they did have loss of material and  
23 cracking of the same component managed by ISI program  
24 and water chemistry.

25 MEMBER ABDEL-KHALIK: Other programs. All

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1 right.

2 MR. PATEL: So, they're managing the  
3 cracking and loss of material, but you didn't need for  
4 thermal embrittlement.

5 MEMBER ARMIJO: So, this was eliminated  
6 based on the material chemistry --

7 MR. PATEL: That is correct.

8 MEMBER ARMIJO: -- and microstructure of  
9 these cast components?

10 MR. PATEL: Right. Right. Right.

11 MEMBER ARMIJO: But, it --

12 MR. PATEL: And the guideline is very  
13 clear. That if it's centrifugally cast material that  
14 aging effect is not a susceptible aging effect.

15 MEMBER ARMIJO: Okay.

16 MS. GETTYS: Thank you, Erach.

17 MEMBER SIEBER: Before we get too far, the  
18 applicant's slide 15 and your slide 21, the numbers  
19 there don't agree.

20 MS. GETTYS: Fifty-one?

21 MEMBER SIEBER: Applicant's 15 and your  
22 21. The applicant says there is 52 aging management  
23 programs. You say 51. He says there is 13  
24 exceptions. You say 11. So, maybe before we finish  
25 you can tell us which slide is --

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1 MS. GETTYS: My slide represents what came  
2 in the LRA and if anything changed about those  
3 programs, it's contained in the SER. I believe the  
4 applicant and I believe what their numbers come from  
5 after the review was done what the changes were.

6 MEMBER SIEBER: So, if I were to bet, I  
7 would bet on the applicant's slide?

8 MR. MEYER: For current conditions.

9 MEMBER SIEBER: Okay. Thanks.

10 MEMBER ABDEL-KHALIK: Back to the flow  
11 restrictor inspection program. I guess the comment  
12 was made that the loss of material is covered in some  
13 other program.

14 MS. GETTYS: Yes. I believe --

15 MEMBER ABDEL-KHALIK: Are there data that  
16 would suggest a change in the flow diameter of these  
17 flow restrictors over the past 20 years? How are they  
18 inspected? How is the loss of material indicated?  
19 How does one measure a change in the flow diameter of  
20 the flow restrictor?

21 MR. PATEL: They're using the ISI program.  
22 ISI program.

23 MEMBER ABDEL-KHALIK: If the flow diameter  
24 is 16 inches at time zero when the plant started, what  
25 is it now and how do they find out?

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1 MR. PATEL: Well, loss of material  
2 basically is for pitting more than anything else.

3 MEMBER ARMIJO: Well, there's a visual and  
4 mechanical measurement -- dimensional measurement?

5 MR. PATEL: Well, they look for pitting.  
6 That's the loss of -- the aging mechanism is pitting  
7 because of it's -- it's stainless material. You got  
8 your water chemistry, but you could have some pitting  
9 involved and that's what they look for.

10 MEMBER ABDEL-KHALIK: And how is that  
11 done? Visually?

12 MR. PATEL: Visually.

13 MEMBER ABDEL-KHALIK: It's not defined?

14 MEMBER SIEBER: Well, it's usually in a  
15 flange. If it's a ventory, it's a section. If it's  
16 just a diaphragm, there's a flange there. So, you  
17 take that apart and pull the -- there's an edge that  
18 comes out. Then you know where it is.

19 MR. PATEL: There's a pipe based upon the  
20 components. So, it's within the pipe itself. It's  
21 not an external component.

22 MEMBER ABDEL-KHALIK: Yes, I understand.

23 MEMBER BROWN: Are these measurement flow  
24 restrictors you're talking about or just flow  
25 restrictors?

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1 MR. PELTON: This is Dave Pelton from  
2 License Renewal.

3 You know, if the licensee has a question,  
4 maybe they can address it a little later. Give you a  
5 chance to talk it through. But, what we'll do in our  
6 end is we'll make sure that -- well, you know, like we  
7 said, we certainly have a number of aging management  
8 programs we do apply to these components and we can do  
9 a review and get back to the members. Just give you  
10 a feel for what do we do and what do we expect the  
11 licensee, do the dimensional check, a visual check, et  
12 cetera. We'll get that to you.

13 MEMBER ABDEL-KHALIK: Yes, just trying to  
14 figure out how real is this. What does it -- how is  
15 this program conducted?

16 MR. PELTON: Good question and we'll get  
17 back to you on that.

18 MS. GETTYS: This table shows the  
19 groundwater sampling, the pH, the chloride and the  
20 stuff that -- okay. I'll talk louder. Susquehanna's  
21 groundwater is non-aggressive for steel imbedded and  
22 concrete.

23 The staff did inspect several manholes and  
24 found water in number 2 and number 16. The water in  
25 the manholes is a generic current operating issue that

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1 is being addressed by the Division of Engineering.

2 Based on its audit and review and the  
3 additional information submitted as a result of the --

4 MEMBER BROWN: Could I interrupt a minute?

5 MS. GETTYS: Yes.

6 MEMBER BROWN: Well, I think I didn't  
7 expand on a question that I asked about how they  
8 determined the inspection frequency and somebody  
9 answered the question relative to -- that you measured  
10 stuff over an eight-month period, determined how fast  
11 they filled up and what you had to do and it was --  
12 and John asked the question is that -- how do you  
13 implement that and I think you said about preventative  
14 maintenance.

15 Have you implemented that now? Are you  
16 doing that now every -- and I didn't ask what the  
17 periodicity was. Or is that something that you're  
18 going to do when you go into the extension period or  
19 what? I mean since you found it, is it now a current  
20 PM where you're actively measuring or checking these  
21 things every year or every two months or every -- you  
22 did it every month I think you commented for the  
23 eight-month period.

24 MR. BRADY: Yes, this is Phil Brady.

25 That's true. We did do the inspection

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1 over an eight-month period. Inspected basically those  
2 manholes to look at what water rate was input.

3 At the time, we, in fact, didn't continue  
4 that effort as far as the pump down. So, as pointed  
5 out here, we, in fact, did see water later.

6 We have, at this point, implemented the  
7 PMs and are in the process of implementing them and  
8 the frequency is adjusted based on the actual intake  
9 results that we had seen previously to assure we  
10 maintain the water level below the medium voltage  
11 cables.

12 So, the periodicity range is anywhere from  
13 three months up to, I think, 18 months was what we had  
14 looked at for the various manholes based on what we  
15 had seen in the previous inspection.

16 MEMBER BROWN: You determined over an  
17 eight-month period that it takes 18 months to refill.

18 MR. BRADY: That's correct. That's --  
19 yes, there's some intervals that the water intake was  
20 very low.

21 MEMBER BROWN: Okay. So, you calculated?

22 MR. BRADY: Yes.

23 MEMBER BROWN: All right.

24 MR. BRADY: Yes.

25 MEMBER BROWN: You did it analytically

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1 from that point.

2 MR. BRADY: That's correct.

3 MEMBER BROWN: But, you are in the process  
4 of executing those PMs, those inspections now as  
5 opposed to -- because you found that you did not keep  
6 them submerged obviously.

7 MR. BRADY: That is correct.

8 MEMBER BROWN: Okay.

9 MR. BRADY: Based on the industry  
10 involvement and the issues that continue to proceed on  
11 this issue, we have, in fact, put those PMs in place  
12 and, in fact, are in the process of implementing  
13 those.

14 MEMBER ABDEL-KHALIK: If the primary  
15 source of water intrusion is rain rather than seepage  
16 of groundwater, what would a frequency of pumping out  
17 based on data collected over an eight-month period  
18 give you? Why is that relevant? Why isn't it  
19 something that you would do every time it rains?

20 MR. BRADY: The manhole structures are  
21 fairly deep and so, when we looked at the periodicity  
22 and the rain, we had had some very large rainstorms  
23 during the period of time that we did the measurement  
24 over the eight-month period. So, in looking at that  
25 and looking at the rate of intake into the manholes,

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1 we felt very comfortable that we were enveloping in  
2 what would be a severe rainstorm.

3 The water level has to get to a very high  
4 height in most of these manholes in order to be an  
5 impact on the medium voltage cables. The medium  
6 voltage cables are normally at the very highest level  
7 within the manhole structure.

8 MEMBER ABDEL-KHALIK: Well, how deep are  
9 these manholes?

10 MR. BRADY: They vary. They vary. I  
11 would say normally they're about 10-foot deep. Is, I  
12 guess, the standard large electrical manholes that we  
13 have at the plant, but you could have some that are a  
14 little bit smaller and not quite as deep. Depending  
15 on the application.

16 MEMBER ABDEL-KHALIK: And there are no  
17 sensors that would tell you what the water level in  
18 those manholes --

19 MR. BRADY: That is correct. There's no  
20 level indication, automatic sensors or alarms that  
21 would indicate that.

22 We do have a sump location in the manhole.  
23 So, when we do go to pump it out, we have a location  
24 where we can put the sump to assure we pump it dry,  
25 but we do not have the level indication at this point.

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1           So, the inspection effort will really be  
2 our input to that determination.

3           MEMBER ABDEL-KHALIK: Thank you.

4           MEMBER BROWN: Thank you, Evelyn, for my  
5 interruption.

6           MR. PELTON: This is Dave Pelton.

7           Let me just add one more aspect to that.  
8 You know, a program is so predicated on operating  
9 experience and this is no different. Where a  
10 licensee, you know, regardless of the particular study  
11 and the scope of that study they do, we would still  
12 expect that they would inform their program using  
13 current operating experience and if necessary, make  
14 adjustments on hey, you know, bad -- whatever the  
15 cause is. So, and we will have opportunities in the  
16 future to do follow-up commitment inspections and  
17 other things that give us the opportunity to look at  
18 their operating experience and make a call as to  
19 whether their current program is informed.

20           MS. GETTYS: On conclusion of the AMPs,  
21 based on its audit and review and the additional  
22 information submitted as a result of the REIs, the  
23 staff concluded that the affects of aging will be  
24 managed so that intended functions will be maintained  
25 consistent with the CLB during the period of extended

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1 operation.

2 Section 3.3.2.2.6, this is an emerging  
3 issue that came up after the SER was issued. The  
4 staff is in the process of requesting additional  
5 information regarding neutron-absorbing material,  
6 Boral, in the spent fuel pool. The staff has a path  
7 for this and will provide the applicant with REIs.  
8 The SER will be revised accordingly.

9 Based on its review of the LRA and  
10 additional information submitted as a result of the  
11 REIs, the staff concluded that except for the Boral  
12 issue in section 3.3.2.2.6, the aging effects will be  
13 managed so that the intended functions will be  
14 maintained consistent with the CLB for the period of  
15 extended operation.

16 Some of Susquehanna's reactor vessel  
17 beltline welds do not have unirradiated Charpy upper  
18 shelf values -- energy values. To determine that this  
19 -- to demonstrate that these welds have adequate  
20 fraction toughness, the applicant performed equivalent  
21 margin analysis for the welds' material.

22 The equivalent margin analysis  
23 demonstrates that the reactor vessel will have a  
24 margin of safety against fracture equivalent to that  
25 required by Appendix G of Section 11 of the AMSE code

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1 and will satisfy the requirements so that Appendix G  
2 of 10 CFR 50 will continue until the end of the period  
3 of standard operation.

4 This slide is a summary slide of the  
5 results for the equivalent margin analysis.

6 In section 4.3 of the SER, the staff  
7 documents its review of the metal fatigue of the  
8 piping and components TLAA. The 60-year fatigue  
9 analysis was performed on the applicable high-fatigue  
10 locations identified in NUREG/CR 6260. The applicant  
11 managed the fatigue for all the Class 1 components  
12 using the Metal Fatigue of the Reactor Coolant  
13 Pressure Boundary Aging Management Program in  
14 accordance to 10 CFR 54.21(c)(1)(iii).

15 Since the issuance of the SER with open  
16 items, the staff identified an area in which  
17 additional information is needed. Specifically, the  
18 feedwater system. The staff is requesting data on the  
19 dissolved oxygen values prior to 1994. The applicant  
20 has previous provided data for the dissolved oxygen  
21 from 1994 through 2007. The staff will issue a formal  
22 RAI to request the dissolved oxygen data for certain  
23 periods between plant startup and 1993.

24 In addition to the dissolved oxygen  
25 concentration issue just mentioned, the staff will

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1 also request additional information on the following  
2 items shown on this slide. The staff will view the  
3 information provided by the applicant and document the  
4 findings in the final SER accordingly.

5 Based on it's review --

6 MEMBER ABDEL-KHALIK: Does the applicant  
7 have the historical data for the dissolved oxygen data  
8 for the period that you have requested?

9 MS. GETTYS: Yes, I believe they do.

10 MR. BARTON: I'm sorry. Go ahead. I  
11 didn't mean to cut in, Evelyn. Were you finished?

12 MS. GETTYS: Yes, sir.

13 MR. BARTON: How many actual open items  
14 are there against this application right now? None?

15 MS. GETTYS: These are emerging issues  
16 that came up after we issued the SER. So, these are  
17 things that we're addressing now.

18 MR. PELTON: This is Dave Pelton.

19 You know, this is a 22-month process and  
20 our tech staff and peer reviews, et cetera, et cetera  
21 as they find these technical issues, we can't always  
22 promise that they'll all be found resolved and fully  
23 fleshed out prior to the ACS subcommittee.

24 But, the way we will treat these, you  
25 know, in generic terms is well, we're just looking to

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1 validate data. We'll probably -- we'll look at them  
2 like we would any confirmatory item. Where right now  
3 we don't believe that there's an issue with the  
4 methodology used to evaluate metal fatigue. However,  
5 we want to validate some of the data that was used to  
6 make sure that their assumptions were bounded.

7 MR. BARTON: But, on some list, there's  
8 some kind of item?

9 MR. PELTON: Yes, we will address it fully  
10 at the -- in our final meeting with you for the full  
11 committee.

12 MEMBER ARMIJO: You'll have all that data  
13 and the analysis done?

14 MR. PELTON: Absolutely.

15 MEMBER ARMIJO: Okay.

16 MR. PELTON: Absolutely. As a matter of  
17 fact, we'll have a slide I can promise you that will  
18 be specific to these items include the Boral issue and  
19 what's a little bit different about the Boral issue is  
20 that's likely going to cause either a new commitment  
21 to be added or an adjustment made to an existing  
22 commitment. So, had we -- you know, we -- you know,  
23 had we identified this, you know, a couple of weeks  
24 ago, we would have had time to call that like a formal  
25 open item if you will. But, we're tracking them the

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1 same way nonetheless and we'll have a full story to  
2 tell at the final meeting.

3 MEMBER ARMIJO: But, they'd have to make  
4 a commitment even if they weren't requesting license  
5 renewal. I mean this is a current problem with the  
6 Boral. So, all plants are going to have to address it  
7 in some way.

8 MR. PELTON: That's exactly right and  
9 again, you know, just to that point, you know, we're  
10 looking at all these generically across all of our  
11 plants and that's -- frankly, that's how we, you know,  
12 have included these today is in our generic reviews  
13 and peer reviews to make sure that we're consistent  
14 with all of our applications.

15 MS. GETTYS: Based on its review, the  
16 staff concluded that the applicant provided an  
17 adequate list of TLAAs. The staff concluded that the  
18 TLAAs will remain valid for the period of extended  
19 operation. TLAAs have been projected to the end of  
20 the period of extended operation. The aging effects  
21 will be managed for the period of extended operations.

22 MEMBER ABDEL-KHALIK: Back to the previous  
23 slide 31.

24 MS. GETTYS: Yes.

25 MEMBER ABDEL-KHALIK: What are your

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1 questions about cycle counting?

2 MS. GETTYS: They're being developed.

3 Those REIs are.

4 MR. PELTON: Well, we have a member of --  
5 this is Dave Pelton. We have a member of the staff  
6 who can come up and talk a little bit about some of  
7 the questions we plan to ask the licensee.

8 MR. YANG: My name's Chuang Yang, NRR.  
9 I'm new member of DOR and the originally bureau of  
10 this fatigue -- metal fatigue and I just continue with  
11 the work.

12 Okay. On the -- for the fatigue analysis,  
13 the most important thing is the number of cycles. I  
14 like to see they have the cycle on track. Some detail  
15 and so, those cycles will go to the fatigue  
16 calculation and we would like to know whether there's  
17 any period of time that data was not tracked and so,  
18 this is the -- this is the main part of the fatigue  
19 evaluation and also, we like to know whether the  
20 program confirm that the transient supported by the  
21 design transient that will ensure that the stress is  
22 within the original stress analysis.

23 So, basically, we want to know the actual  
24 cycles which go to fatigue calculation and also like  
25 to see -- one of the application, the tables of

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1 fatigue projection, the cycle projection and the  
2 fatigue value projection have some -- of some thing.  
3 I like to know whether they are consistent or not  
4 because if the cycles -- the projected cycle and the  
5 projected fatigue in the non-environmental fatigue  
6 area, I like to see whether they continually, you  
7 know, projected for the fatigue part.

8 MEMBER STETKAR: Are these -- I thought I  
9 read in the SER though several questions were asked  
10 about cycle counting and cycle projections and the  
11 conclusions were generally acceptable. So, this is --

12 MS. GETTYS: Additional questions being  
13 asked.

14 MEMBER STETKAR: Just because somebody  
15 else is looking at it or --

16 DR. LI: This is Sam Li. I'm, you know,  
17 with the last reveal.

18 We're asking REI, you know, in the process  
19 and they responded. They gave us cycles for the last  
20 ten years.

21 MEMBER STETKAR: Um-hum.

22 DR. LI: Okay. But, the plan had been,  
23 you know, in operation for more than ten years.

24 MEMBER STETKAR: Okay.

25 DR. LI: So, now before, give us the rest

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1 of the data.

2 MEMBER STETKAR: Okay.

3 DR. LI: Okay. So, we can fully evaluate.

4 MEMBER STETKAR: Okay. I just -- I was --

5 CHAIR SHACK: Okay. So, I mean they've  
6 included that in their analysis. You just want to  
7 confirm --

8 DR. LI: That's right.

9 CHAIR SHACK: -- the cycle count.

10 DR. LI: They include it for the -- they  
11 actually gave us data up to the last ten years. I  
12 mean for the last ten years. We wanted to see what  
13 happened before the last ten years in terms of data.  
14 Just to confirm the analyses that you base on --

15 MEMBER STETKAR: Yes, I understand. They  
16 made their projections based on the average cycles per  
17 year, but only over the last ten-year operating  
18 period.

19 DR. LI: That's correct.

20 MEMBER STETKAR: So, you're asking now to  
21 extend --

22 DR. LI: Yes, to go back to the original  
23 operation and cover the gap.

24 MR. HOLIAN: This is Brian Holian.

25 It is confirmatory. The original reviewer

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1 did review it and accept it based on their  
2 projections. We have the time. We've had questions  
3 even from this body to make sure that you do a good  
4 look back as best as we can. So, we have that time  
5 and we're asking those confirmatory questions.

6 MEMBER STETKAR: Okay. Thanks.

7 MS. GETTYS: In the SER with open items,  
8 the staff concluded that on the basis of its review of  
9 the LRA the staff determined that the requirements of  
10 10 CFR 54.29(a) have been met. However, as previously  
11 mentioned, the staff has identified the need for  
12 additional information in a few areas in order to  
13 complete its review.

14 The staff will document its conclusion  
15 regarding the LRA of Susquehanna in the final SER  
16 which is currently scheduled to be issued August 2009.

17 That's all I have.

18 CHAIR SHACK: Any additional questions  
19 from the members?

20 MEMBER ARMIJO: Yes. Could you -- I may  
21 have misunderstood the -- your explanation of slide  
22 28, the vessel neutron embrittlement. I thought I  
23 heard you mention that there was material that you  
24 didn't have, original vessel material Am I confused  
25 or -- exactly what happened with this analysis. Why

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1 did you need a margins analysis with generic material  
2 as opposed to the actual vessel?

3 MS. GETTYS: Simon Sheng is coming to the  
4 -- speaking.

5 MR. SHENG: This is Simon Sheng, Associate  
6 with Division of Component Integrity. I'm the  
7 reviewer for the this issue.

8 In Susquehanna's case, okay, it's typical  
9 of BWR plants that for certain bottom line materials  
10 they don't have the initial upper shelf energy values.  
11 So, they have to result -- and this issue was  
12 discovered more than ten years ago. So, that the BWR  
13 Owners Group did a public report and using the so-  
14 called equivalent margin analysis and equivalent  
15 margin analysis is nothing but a elastic fracture  
16 mechanics analysis and using the GR curve as a  
17 resistance and using the applied stress intensity  
18 factor as a driving force.

19 And in that -- because they don't have  
20 that -- they don't have the initial upper shelf  
21 energy, so, what GE did was that they did statistic  
22 analysis on all the bottom line materials that BWR  
23 has. Which they have initial values. They didn't  
24 have values and see what's mean minus 2 standard  
25 division value and in one of the materials, they even

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1 go lower than that. So, if any of the data fall below  
2 that mean minus two value, they use that as an initial  
3 upper energy value for this generic material.

4 So, GE did analysis and had several --  
5 separate these materials into several groups and using  
6 this mean minus two sigma value to establish initial  
7 upper shelf energy value and they -- and then they use  
8 a very severe fluence to predict the reduction and  
9 then they start -- for instance, like they certify  
10 foot-pound. Is a value they established which is  
11 wholly supported by the elastic plastic fracture  
12 mechanical analysis and that initial value 59. Really  
13 upper shelf energy was established by that -- their  
14 statistical analysis I just mentioned and that 54 EFPY  
15 projected upper shelf energy was based on the 54 EFPY  
16 fluence. So --

17 MEMBER ARMIJO: At EPU conditions included  
18 in --

19 MR. SHENG: Yes. Yes.

20 MEMBER ARMIJO: Okay.

21 MR. SHENG: And you can see that the  
22 reductions of upper shelf energy or this generic  
23 analysis something like more than 23 percent in one  
24 case and probably more than 30 percent for another  
25 case and Susquehanna's passive analysis 04 within that

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1 region of reduction. So, it's okay.

2 MEMBER ARMIJO: Okay. Thank you.

3 MR. SHENG: Thank you.

4 MEMBER ARMIJO: Yes. Understand.

5 MEMBER ABDEL-KHALIK: So, how is that Unit  
6 1 lower intermediate shell number 2 and the Unit 2  
7 weld number 3 determined to be the limiting locations?

8 MR. SHENG: For this case, as I said, that  
9 if you don't have initial upper shelf energy value,  
10 it's very, very hard for me to select a really  
11 limiting material and the reason I selected that one  
12 is because they don't have the initial upper value.  
13 They don't have test data to draw a curve so that they  
14 can determine the initial upper shelf energy. They  
15 only have one data point and that data point show very  
16 low value for that material. So, I just kind of  
17 selecting as a limiting upper shelf energy material.  
18 It's kind of arbitrary.

19 However, it's better in this case because  
20 in one case, I have the generic bottom line material.  
21 The plate material to cover that and in the second  
22 case, I also have the generic analysis for weld to  
23 cover this. So, basically, that this will be more  
24 complete.

25 MEMBER ARMIJO: Thank you.

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1 CHAIR SHACK: Let me just ask this again.  
2 I can understand your upper shelf energy problem. Do  
3 you actually know the compositions of these materials?

4 MR. SHENG: Composition is chemical  
5 composition.

6 CHAIR SHACK: Chemical composition.

7 MR. SHENG: Yes, I do.

8 CHAIR SHACK: Okay. So, what you do is  
9 you use the statistic thing to determine the initial  
10 lower shelf and then you use your usual correlations  
11 to determine the embrittlement based on chemistry?

12 MR. SHENG: Yes, the deduction -- the  
13 reduction --

14 CHAIR SHACK: Reduction.

15 MR. SHENG: Plus there's reductions.

16 CHAIR SHACK: Okay.

17 MR. SHENG: So, it's not in that generic  
18 analysis. In the generic analysis, that's --

19 CHAIR SHACK: Yes, they just use --

20 MR. SHENG: -- that's also. Yes, it's  
21 just based on generic material.

22 CHAIR SHACK: But, then you do that  
23 calculation to show that your reduction isn't greater  
24 than that generic reduction.

25 MR. SHENG: It's smaller. My reduction is

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1 smaller. Right.

2 CHAIR SHACK: Okay. That's what I  
3 thought.

4 MR. SHENG: Okay.

5 CHAIR SHACK: Yes.

6 MR. SHENG: Thank you.

7 CHAIR SHACK: Any other questions? Well,  
8 then I think we're through. I'd like to thank the  
9 licensee and the staff for it's presentations this  
10 morning. I think they've been helpful.

11 We understand we had some issues that  
12 still need to be resolved, but we'll be discussing  
13 those at the full committee meeting.

14 Thank you very much.

15 (Whereupon, the meeting was concluded at  
16 11:56 a.m.)

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## **Advisory Committee on Reactor Safeguards License Renewal Subcommittee**

### **Susquehanna Steam Electric Station Units No. 1 and 2 Safety Evaluation Report with Open Items**

April 1, 2009

Evelyn Gettys, Project Manager  
Office of Nuclear Reactor Regulation



## Introduction

- Overview
- Section 2: Scoping and Screening Review
- License Renewal Inspections
- Section 3: Aging Management Program and Review Results
- Section 4: Time-Limited Aging Analyses (TLAAs)



## Overview

- LRA Submitted by letter dated Sept 13, 2006
- GE Boiling Water Reactor (BWR), Mark II containment
- Jan. 30, 2008 - Extended Power Uprate (EPU) was granted to SSES to operate at  
3952 MWth, 1300 MWe for Units 1 & 2
- Operating license for Unit 1- NPR-14 expires July 17, 2022
- Operating license for Unit 2- NPR-22 expires March 23, 2024
- Located approximately 7 miles NE of Berwick, PA



## Overview

- Safety Evaluation Report with Open Items was issued March 2009
- 278 RAI's Issued
- 59 Commitments



## Overview

- Scoping and Screening Methodology Audit
  - December 11 - 15, 2006
- Aging Management Programs (AMP) Audit
  - May 5 - 9, 2008
- Regional License Renewal Inspections
  - August 11 – 15, 2008
  - August 25 – 29, 2008



## **Section 2: Structures and Components Subject to Aging Management Review**

### **Section 2.1—Scoping and Screening Methodology**

- Applicant amended the LRA to include portions of (1) NSR piping attached to SR SSCs located within containment and (2) NSR piping attached to SR SSCs at containment penetrations and extending outside of containment, in accordance with 10 CFR 54.4(a)(2)
- Based on the review of the LRA and additional information submitted as a result of Requests for Additional Information (RAIs), the staff concluded that the applicant's methodology is consistent with the requirements of 10 CFR 54.4 and 54.21(a)(1)



## **Section 2: Structures and Components Subject to Aging Management Review**

### **Section 2.2 – Plant-Level Scoping Results**

- Based on its review of the LRA and additional information submitted as the result of RAIs the staff concluded the applicant identified systems and structures within the scope of license renewal per 10 CFR 54.4



## **Section 2.3 – Scoping and Screening Results Mechanical Systems**

- Based on its review of the LRA and additional information submitted as the result of RAIs the staff concluded that there were no omissions of structures or structural components from scope of license renewal in accordance with 10 CFR 54.4(a), and no omissions from AMR in accordance with 10 CFR 54.21(a)(1)



## **Section 2.4 – Scoping and Screening Results: Structures**

- Based on its review of the LRA and additional information submitted as the result of RAIs the staff concluded that there were no omissions of structures or structural components from scope of license renewal in accordance with 10 CFR 54.4(a), and no omissions from AMR in accordance with 10 CFR 54.21(a)(1)



## **Section 2.5 – Scoping and Screening Results Electrical and Instrumentation and Control Systems**

- As a result of the staff's review, sections of the offsite switchyard were included in the scope of license renewal for Station Blackout (SBO) in accordance to 10 CFR 54.4(a)(3)
- Based on its review of the LRA and additional information submitted as the result of RAIs the staff concluded that there were no omissions of electrical and instrumentation and control system components from the scope of license renewal in accordance with 10 CFR 54.4(a), and no omissions from AMR in accordance with 10 CFR 54.21(a)(1)



## **Section 2.6 – Conclusion for Scoping and Screening**

- The applicant's scoping and screening methodology is consistent with the requirements of 10 CFR 54.4 and 10 CFR 54.21(a)(1)
- The applicant adequately identified those SSCs within the scope of license renewal in accordance with 10 CFR 54.4(a) and those SCs subject to an AMR in accordance with 10 CFR 54.21(a)(1)



# **License Renewal Inspections**

**Glenn Meyer**

Region I Inspection Team Leader



## **Inspection Objectives**

- Scoping of non-safety SSCs
- 12 New Aging Management Programs
- 17 Existing Aging Management Programs
- HPCI System Review



## Scoping

- Scoping of non-safety SSCs – generally accurate and acceptable
- Structural and spatial interactions reviewed
- LRA Amendment to update HPCI cables in Turbine Building



## **New AMPs**

- Supplemental Pipe/Tank Inspection
- Buried Piping and Tanks Inspection
- Area-Based NSAS Inspection
- Chemistry Program Effectiveness Insp.
- Small Bore Class 1 Piping Inspection



## Existing AMPs

- Structures Monitoring
- Masonry Wall
- Fuel Oil Chemistry
- Piping Corrosion
- Fire Water
- Instrument Air Monitoring
- System Walkdown
- Closed Cooling Water Chemistry
- Preventive Maintenance Activities –RCIC/HPCI Turbine Casings
- Leak Chase Channel Monitoring



## **HPCI System Review**

- Aging effects have been addressed
- Coverage of AMPs was appropriate

## **AMP Conclusion**

- Proposed activities are capable of managing aging effects

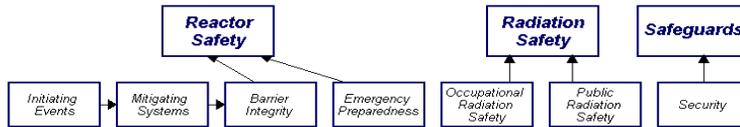


## **Inspection Conclusions**

- Scoping of non-safety SSCs and aging management programs are acceptable.
- Inspection results support a conclusion of reasonable assurance that aging effects will be managed and intended functions will be maintained.

## **Current Performance**

- Both units – Licensee Response Column
- All Findings – Green
- All Performance Indicators (PIs) - Green



**Performance Indicators**



*Last Modified: January 30, 2009*



## **Section 3: Aging Management Review Results**

- Section 3.0 – Aging Management Programs
- Section 3.1 – Reactor Vessel & Internals
- Section 3.2 – Engineered Safety Features
- Section 3.3 – Auxiliary Systems
- Section 3.4 – Steam and Power Conversion System
- Section 3.5 – Containments, Structures and Component Supports
- Section 3.6 – Electrical and Instrumentation and Controls System



### **Section 3.0.3 Aging Management Programs**

- 52 AMPs reviewed by the Staff
  - 20 are New Programs
  - 32 are Existing Programs
- 28 were identified as consistent with GALL Report
- 7 with enhancements
- 11 with exceptions
- 2 with both enhancements and exceptions
- 4 were identified as plant-specific programs



### **Section 3.0.3 Aging Management Programs**

- Preventive Maintenance Activities –Main Turbine (B.2.49) was added
- Fuse Holders Program (B.2.50) was added.
- Main Steam Flow Restrictor Inspection Program (B.2.26) was deleted.



### Section 3.0.3 - AMPs

- Groundwater sampling for pH, chloride, and sulfate concentrations will be performed yearly during the period of extended operation.
- SSES Groundwater is non-aggressive

	Acceptance Criteria	2006	2007
pH	>5.5	6.11	6.13
Chlorides	<500 ppm	23.1 ppm	40.4 ppm
Sulfates	<1500 ppm	43.2 ppm	54.6 ppm



### **Section 3.0.3 – Non-EQ Inaccessible Medium-Voltage Cables Program**

- Several manholes inspected during AMP audit and Regional inspection
  - Some submerged medium voltage cables found in manhole # 2
  - Water, but no submerged cables found in manholes # 16
- Water in manholes is a generic, current operating plant issue that is being addressed during the current period of operation through the reactor oversight process in accordance with the requirements of 10 CFR Part 50



## **Section 3.0.3 – AMPs**

- Based on it's audit and review, and the additional information submitted as the result of RAIs, the staff concluded that the effects of aging will be managed so that intended function(s) will be maintained during the period of extended operation, per 10 CFR 54.21(a)(3)



### **Section 3.3.2.2.6 Reduction of Neutron-Absorbing Capacity and Loss of Material due to General Corrosion**

- Staff in process of requesting additional information regarding neutron absorbing material (Boral) in the Spent Fuel Pool
  - Surveillance of the material will continue until the end of the current operating license
  - Staff has concerns on whether any loss in neutron absorbing functionality will be adequately detected and managed in the period of extended operation



## Section 3.7 Conclusion

- Based on its review of the LRA and additional information submitted as the result of RAIs, the staff concluded that except for issue of Boral in Section 3.3.2.2.6 the:
  - Aging effects will be managed so that the intended functions will be maintained consistent with the CLB for the period of extended operation, per 10 CFR 54.21(a)(3)



## Section 4.2: Reactor Vessel Neutron Embrittlement – Upper Shelf Energy (USE)

Reactor Vessel limiting material	Fluence (E>1 MeV) at 1/4T 10 <sup>19</sup>  (n/cm <sup>2</sup> )	Evaluation Using Equivalent Margins Analysis (Relevant Generic Material)		
		Unirradiated USE (ft-lb)	54 EFPY Projected USE (ft-lb)	EOL USE Acceptance Criteria (ft-lb)
Unit 1 Lower Intermediate Shell No. 2	<b>0.0974</b>	<b>59</b>	<b>45</b>	<b>35</b>
Unit 2 weld No. 3	<b>0.0815</b>	<b>84.5</b>	<b>51.5</b>	<b>35</b>



- **Section 4.3 – Metal Fatigue of Piping and Components**

- 60-year fatigue analyses were performed for the applicable high-fatigue locations of NUREG/CR-6260
- SSES Units 1 & 2 will manage fatigue of all Class 1 components using the Metal Fatigue of Reactor Coolant Pressure Boundary Aging Management Program



- **Section 4.3.3 – Effects of Reactor Coolant Environment on Fatigue Life of Components and Piping (GSI-190)**

- **Feed Water System**

- Fen values calculated based on assumed DO (dissolved oxygen) concentration data lower than 0.05 ppm.
- Applicant did not provide records of monitored DO data for time period before 1994
- Staff awaiting confirmation of the DO level's historically maintained at SSES



## **Fatigue Monitoring Program**

- The Staff has additional questions to ask on couple items
  - Transient monitoring and cycle counting
  - CUF values



## Conclusion for TLAA

Based on its review of the LRA and additional information submitted as the result of RAIs, the staff concluded that the applicant provided an adequate list of TLAAs, per 10 CFR 54.3 and that except for the fatigue issues of 4.3.3 the:

- TLAAs will remain valid for the period of extended operation, per 10 CFR 54.21(c)(1)(i)
- TLAAs have been projected to the end of the period of extended operation, per 10 CFR 54.21(c)(1)(ii)
- Aging effects will be managed for the period of extended operation, per 10 CFR 54.21(c)(1)(iii)



## Conclusion

- The staff's conclusion regarding the LRA for SSES will be provided in the Final SER scheduled to be issued in August, 2009

# Susquehanna Steam Electric Station

## License Renewal ACRS Subcommittee Meeting

April 1, 2009





# Introductions

- ▶ Rick Pagodin, General Manager – Engineering
- ▶ John Kraiss, Manager – Special Projects
- ▶ Nick D’Angelo, Manager – Station Engineering
- ▶ Dave Flyte, License Renewal Lead Engineer
- ▶ Subject Matter Experts and LR Project Team



# Agenda

- ▶ Background
- ▶ Operating History
- ▶ Major Modifications
- ▶ License Renewal Team/Schedule
- ▶ Scoping Discussion
- ▶ Application of GALL
- ▶ Commitment Process
- ▶ Topics of Interest
- ▶ Summary



# Background

- ▶ Location: Northeast Pennsylvania
- ▶ Plant Owners
  - PPL Susquehanna, LLC (90%)
  - Allegheny Electric Cooperative (10%)
- ▶ Licensee/Operator: PPL Susquehanna, LLC



# Background

- ▶ Two Units - BWR/4
  - 3952 MWt
  - 1300 MWe
- ▶ General Electric (NSSS), Bechtel (AE)
- ▶ Ultimate Heat Sink – Spray Pond
- ▶ Turbine Cycle Cooling Provided By Natural Draft Towers
- ▶ Make-up Water – Susquehanna River



# Operating History

- ▶ Construction Permit November 1973
- ▶ Operating License (Unit 1/Unit 2) July 1982/March 1984
- ▶ Stretch Power Uprate ~4.5%  
(Unit 1/Unit 2) February 1995/ April 1994
- ▶ MUR Power Uprate ~1.5% July 2001
- ▶ LRA Submitted September 2006
- ▶ Extended Power Uprate ~14% January 2008
- ▶ License Expires (Unit 1/Unit 2) July 2022/March 2024



# Operating History

## ▶ Unit One

- Refueling Outage 15 Completed in April 2008
- First Step EPU Implemented May 2008

## ▶ Unit Two

- Refueling Outage 13 Completed in April 2007
- Record Continuous Run



# Selected Major Modifications

- ▶ 5th Emergency Diesel Generator
- ▶ Generator Stator Rewind
- ▶ Feedwater Heater #3 and #4 Replacement
- ▶ Main Turbine Replacement
- ▶ Added Condensate Filtration System
- ▶ Hydrogen Water Chemistry/Depleted Zinc Oxide
- ▶ Main Transformer Replacement
- ▶ 4 KV Breaker Replacement
- ▶ River Water Makeup Piping Replacement



# Selected Major Modifications

- ▶ 480 VAC MCC Bucket Replacement
- ▶ Jet Pump Labyrinth Seals
- ▶ Jet Pump Hold Down Beam Replacement
- ▶ Main Turbine Moisture Separator Vane Replacement
- ▶ MSIV Leakage Control Modifications
- ▶ Reactor Core Stability – OPRM Modifications
- ▶ RHRSW Pump Suction Bell Replacement
- ▶ Turbine Building Roof Replacement
- ▶ CREOASS Air Intake Relocation



# License Renewal Team

- ▶ License Renewal Project Team
  - Project Initiated in 2002
  - PPL/AREVA Team Established in 2004
- ▶ LR Team Engaged with the Industry
  - NEI LR Task Force and Working Groups
  - Observed Audits/Inspections of Peer Plants
  - Participated in LR Peer Reviews
- ▶ Plant Subject Matter Experts Involved



# License Renewal Schedule

## ► Schedule and EPU

- LR and EPU Part of Special Projects Group
- LRA Developed at EPU Conditions
- LRA Submitted September 2006
- EPU Submitted October 2006
- NRC Safety Review on Hold ~ 1 Year Pending EPU Review/ Approval
- Environmental Review Continued
- NRC Safety Review Resumed February 2008



# License Renewal Project

- ▶ Scoping Discussion
- ▶ Application of GALL
- ▶ Time Limited Aging Analyses
- ▶ Commitment Process



# License Renewal Project - Scoping

## ▶ Scoping

- Process Consistent with NEI 95-10 Rev 6
- Conservative “Spaces” Approach used for (a)(2) Scoping for Spatial Interaction
- Mechanical Boundary Drawings Identify (a)(1), (a)(2) and (a)(3) In-Scope Components



# License Renewal Project - GALL

## ▶ Aging Management Reviews

- Followed NEI 95-10 Guidance for AMRs
- Used NUREG-1801, GALL
- 82% of AMR Line Items Consistent with GALL (used notes A-E)



# License Renewal Project - GALL

- ▶ Aging Management Programs
  - 51 SSES Programs Credited for LR
    - 20 Existing Programs with No Change
    - 12 Existing Programs with Enhancements
    - 19 New Programs (10 One-Time Inspections)
  - GALL/Plant-Specific
    - 47 GALL Programs (13 with Exceptions)
    - 4 Plant-Specific Programs



# License Renewal Project - GALL

- ▶ 13 SSES AMPs with Exceptions to GALL
- ▶ Aging Effects Effectively Managed
- ▶ Typical GALL AMP Exceptions
  - AMP Scope Differences
  - Use of Alternative Inspection/Monitoring Methods
  - Differences in Parameters Monitored, Detection of Aging Effects, and Preventive Actions



# License Renewal Project - TLAA

- ▶ TLAA Identification/Disposition  
Consistent with NUREG-1800 and NEI 95-10
- ▶ TLAA's Dispositioned in Accordance with  
10 CFR 54.21(c)(1)

The logo for PPL Susquehanna, LLC is circular. It features a stylized atom with a yellow star in the center and three red and white orbiting paths. The text "PPL Susquehanna, LLC" is written along the top arc, and "One Team One Commitment" is written along the bottom arc.

# License Renewal Project - Commitments

- ▶ 59 Regulatory Commitments for License Renewal
- ▶ Entered into the SSES Commitment Tracking Process
- ▶ Commitments Assigned to Station Personnel for Implementation



# Topics of Interest

## Inspection of RHR SW/ESW Pipe Vault

- ▶ Material and Environment as Evaluated in LRA
  - Conditions in the Vault Were Dry
  - Pipes Wrapped per Design Drawings
- ▶ Visual Inspection Confirmed No Significant Degradation



# Topics of Interest

## Underground Medium Voltage Cables

- ▶ 15 kV Non Safety-Related Cables
  - 13.8 kV Offsite Power Supply Circuit from Startup Transformers to Turbine Building
    - 5 Manholes - Submerged MV Cables Observed in 2 Manholes
  - 13.8 kV Offsite Power Supply Circuit from Reactor Building to ESS Transformers
    - Short Run - No Manholes
- ▶ License Renewal Commitment, Prior to PEO
  - Test Offsite Power Supply Underground MV Cables
  - Inspect/Pump Manholes to Keep MV Cables from Exposure to Standing Water



# Topics of Interest

## Underground Medium Voltage Cables

- ▶ 5 kV Safety-Related Cables
  - 4.16 kV Emergency Diesel Generator, RHRSW and ESW System Cables
  - 10 Manholes – No Submerged MV Cables Observed During Inspections
  - Energized Less Than 25% of Time



# Topics of Interest

## SBO Recovery Scoping

- ▶ Offsite Power Supply Scoping Boundary for Station Blackout Recovery is per the Latest Staff Guidance
- ▶ Includes 230 kV Circuit Breakers in Three Switchyards



# Summary

- ▶ LRA Conforms to Regulatory Requirements and Follows Industry Guidance
- ▶ SSES Will Manage Aging in the Period of Extended Operation