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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION  
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS (ACRS)

539TH MEETING

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WEDNESDAY, FEBRUARY 1, 2007

VOLUME I

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The meeting was convened in Room T-2B3 of  
Two White Flint North, 11545 Rockville Pike,  
Rockville, Maryland, at 8:30 a.m., DR. WILLIAM J.  
SHACK, Chairman, presiding.

MEMBERS PRESENT:

- WILLIAM J. SHACK, Chairman
- JOHN D. SIEBER, Vice Chairman
- SAID ABDEL-KHALIK, Member
- GEORGE E. APOSTOLAKIS, Member
- J. SAM ARMIJO, Member
- SANJOY BANERJEE, Member
- MARIO V. BONACA, Member
- MICHAEL L. CORRADINI, Member
- THOMAS S. KRESS, Member
- OTTO L. MAYNARD, Member
- DANA A. POWERS, Member
- GRAHAM B. WALLIS, Member

1     STAFF PRESENT:

2                   ZENA ABDUALLY  
3                   WILLIAM H. BATEMAN  
4                   GARY HAMMER  
5                   CORNELIUS HOLDEN  
6                   MICHAEL JUNGE  
7                   RALPH LANDRY  
8                   TIMOTHY R. LUPOLD  
9                   RALPH MEYER  
10                  BOB RADLINSKI  
11                  TANEY SANTOS  
12                  TED SULLIVAN  
13                  JENNIFER L. UHLE  
14                  SUNIL WEERAKKODY

15     ALSO PRESENT:

16                  JOHN ALVIS  
17                  MICHAEL C. BILLONE  
18                  BERTRAND DUNNE  
19                  NAYEM JAHINGIR  
20                  CHRISTINE KING  
21                  ALEX MARION  
22                  ODELLI OZER  
23                  JIM RILEY  
24                  MIKE ROBINSON  
25                  GLENN WHITE

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System Analysis Code

Adjourn

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A-F-T-E-R-N-O-O-N S-E-S-S-I-O-N

1:18 p.m.

CHAIRMAN SHACK: On the record. I'd like to come back into session now. We're going to be discussing the final review of the license renewal application for Oyster Creek Generating Station and Otto Maynard will lead us through that. Thank you.

MEMBER MAYNARD: Thank you, Mr. Chairman. As many of you know, we've had two subcommittee meetings on this subject, one in fact last October. The other was January of this year. During those meetings, a number of questions have been asked, raised, answered, developed. We've had the benefit of looking at a lot of data. A lot of information has been provided to the ACRS members to review. Some of that has answered questions. Some of it generates questions and that's the purpose of this meeting.

We've also received input from the public and we've received some letters from the Congressional representatives from New Jersey. We've also received a letter, actually I think the Commissioners did, from the governor inviting us if we needed to to come to Oyster Creek for a meeting there and discuss information further. So getting a lot of interest.

We also have some people on the telephone

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1 listening today. We need to make sure that everybody  
2 does speak up so the people on the phone can hear us.  
3 We'll do our best to keep that going.

4 The presentation today, we're going to be  
5 going over some of the material in the beginning just  
6 to bring everybody up to speed and I would caution the  
7 members. If there's something from clarity from the  
8 beginning of that on the history, that's fine. But  
9 we're going to be getting a number of the specific  
10 details of certain issues after the Licensee, the  
11 Applicant, has gone through some of those. So we'll  
12 keep an eye on that so we don't spend too much time on  
13 history that's already been gone over in some of the  
14 various meetings there.

15 After all of our discussion, there are two  
16 key areas that have still generated a lot of questions  
17 and interest. One is the continued leakage that is  
18 seen for refueling outage and stuff, although it's put  
19 in the drain capacity, I think there's still some  
20 interest in discussing that. The other gets into the  
21 analysis done for the containment shell, the drywell  
22 shell and the use of certain code cases, the  
23 applicability of that, and I understand we're going to  
24 have some good discussion on that as well as some  
25 other things. So there is a number of key issues that

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1 are going to be addressed.

2 With that, I'd like to turn it over to Bob  
3 Schaff of the staff just to get us started with the  
4 staff and then I think turn it over to the Applicant.

5 MR. SCHAFF: Thank you, Mr. Maynard. My  
6 name is Bob Schaff. I'm the Acting Branch Chief for  
7 License Renewal Branch A in the Division of License  
8 Renewal. To my left is Pat Hiland who is the Director  
9 of NRR Division of Engineering. To his left is Louise  
10 Lund who is Acting Deputy Director for the Division of  
11 License Renewal. To my right is Donnie Ashley. He is  
12 the Project Manager for the review of AmerGen's  
13 application for the renewal of the Oyster Creek  
14 operating license. We also have a number of members  
15 of NRR's Technical Staff in the audience who are  
16 available to provide additional information and answer  
17 any questions that the Committee may have today.

18 As Mr. Maynard noted, several questions  
19 regarding the Oyster Creek drywell shell remain the  
20 following last license renewal subcommittee meeting  
21 held last month. Today's meeting will allow the  
22 Applicant and the NRC staff an opportunity to respond  
23 to those questions as part of their presentations.

24 With that, I'd like to turn the meeting  
25 over to Mike Gallagher, Vice President of Exelon's

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1 license renewal group to begin the Applicant's  
2 presentation.

3 MR. GALLAGHER: Okay. Thank you, Bob.  
4 Good afternoon. My name is Mike Gallagher and I'm the  
5 Vice President of License Renewal Projects for AmerGen  
6 and Exelon. Also with me here today from our senior  
7 management team is Rich Lopriore, our Senior Vice  
8 President of MidAtlantic Operations and Mirshak Rame,  
9 our Senior Vice President for Engineering and  
10 Technical Services.

11 On January 18th, we presented to the  
12 subcommittee the details and basis for our overall  
13 conclusions on the Oyster Creek drywell corrosion  
14 issue and just to recap, our overall conclusions are  
15 the corrective actions to mitigate drywell shell  
16 corrosion have been effective; drywell shell corrosion  
17 has been arrested in the sand bed region and continues  
18 to be very low in the upper drywell elevations; and  
19 the service life of the drywell shell extends beyond  
20 20.29 with margin. The corrosion on the embedded  
21 portion of the drywell shell is not significant due to  
22 the environment of embedded steel and concrete. The  
23 drywell shell meets code safety margins and we have an  
24 effective aging management program in place to ensure  
25 continued safe operation of Oyster Creek.

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1                   For today's presentation, we will provide  
2 a summary of the drywell shell corrosion issue. Can  
3 we go to the agenda? However, we can go into any  
4 level of detail that you desire.

5                   We also will have discussed five issues  
6 that the subcommittee had from our last meeting and  
7 our proposed resolution and you mentioned two  
8 specifically, Mr. Maynard. We have those covered. We  
9 will also provide an overall summary of our license  
10 renewal application at the end of the meeting.

11                   Our handouts today are we have the  
12 presentation. We have the reference material booklet  
13 which is the same reference material booklet we  
14 provided last time. It has the pictures and the  
15 detailed graphs of the entire drywell and we also are  
16 providing to you today this table which is a summary  
17 of all our drywell inspections and that's one of the  
18 five issues we want to talk to you about later in our  
19 presentation.

20                   Also this week, I did send in a letter,  
21 Subcommittee Chair Maynard, with AmerGen's response to  
22 issues presented to the subcommittee during the public  
23 comments session of the subcommittee meeting just for  
24 your consideration.

25                   Presenting for AmerGen today will be Fred

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1 Polaski, John O'Rourke and Ahmed Ouaou from our  
2 License Renewal group. We also have with us here  
3 today Dr. Hardiyal Mehta from General Electric for our  
4 presentation on the capacity reduction factor which is  
5 in our buckling analysis and we also have Dr. Clarence  
6 Miller, the author of Code case N-284 which relates to  
7 the capacity reduction factor. And both Dr. Mehta and  
8 Dr. Miller will be making a presentation later on in  
9 our presentation.

10 I'll now turn the presentation over to  
11 Fred Polaski who will go through some background and  
12 then the drywell corrosion issue.

13 MEMBER MAYNARD: Before you, since you  
14 brought up your letter, I need to mention that at the  
15 beginning of the full Committee meeting this morning  
16 we acknowledged letters that we had received. But  
17 some of the people may not have been in the room at  
18 the time and in addition to your letter, we also  
19 received a letter from Mr. Webster and others  
20 mentioned earlier from Congressmen and the Governor.  
21 So there is other correspondence and I believe Mr.  
22 Webster also is going to be making comments at the end  
23 of the meeting today. So just to put that on the  
24 record, although it was stated this morning also.

25 Go ahead, Mr. Polaski.

1 CHAIRMAN SHACK: That was very helpful.

2 MR. POLASKI: The second issue that the  
3 subcommittee raised was that the thickness margin may  
4 be better understood with a modern three-dimensional  
5 finite element model with various thickness and  
6 thickness configurations in the sand bed region could  
7 be evaluated. And our response is that (1) our  
8 current licensing basis analysis demonstrated that the  
9 Code requirements were made and that's what we've just  
10 been discussing; (2) because the GE model used a  
11 uniform thickness corresponding to the lowest average  
12 thickness measured, we agree that use of a modern  
13 modeling technique inputting actual shell thicknesses  
14 should demonstrate more thickness margin and a larger  
15 safety factor; and lastly, in order to better  
16 understand the margin that is available for the Oyster  
17 Creek drywell shell, AmerGen will be performing a 3-D  
18 finite element analysis of the Oyster Creek drywell.  
19 This analysis will be completed prior to entering the  
20 period of extended operation.

21 MEMBER MAYNARD: Just to make sure I  
22 understand because I believe that Item 3 is a new  
23 commitment that we had not discussed or talked about.

24 MR. GALLAGHER: Yes, that's correct, Mr.  
25 Maynard, but we're trying to address the issues that

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1 you all brought up and this is a new commitment. It  
2 is a significant commitment on our part and we will do  
3 that.

4 MEMBER MAYNARD: Okay. And I wanted to  
5 make sure that your position, you would be willing --  
6 you would be making this as a commitment to be done,  
7 not just something that you're thinking about doing.

8 MR. GALLAGHER: That's correct and we will  
9 send in a letter with this commitment following the  
10 meeting.

11 MEMBER MAYNARD: Okay. I don't think any  
12 of the members would tell you not to do that.

13 (Laughter.)

14 MR. GALLAGHER: We didn't think so.

15 MR. POLASKI: Mr. John O'Rourke will now  
16 present the other three subcommittee issues, those  
17 being the issue with the reactor cavity liner leakage,  
18 future monitoring programs and the interior surface of  
19 the embedded drywell shell. John.

20 MR. O'ROURKE: The next issue from the  
21 January 18th subcommittee meeting was that the leakage  
22 through the reactor cavity liner should be eliminated.  
23 We agree that eliminating the liner leakage would be  
24 desirable. Our current program is designed to control  
25 this leakage to ensure that no water gets into the

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1 sand bed region and it was proven successful during  
2 the 2006 refueling outage. However, based on the  
3 subcommittee's input, we have decided to perform an  
4 engineering study prior to the period of extended  
5 operation to investigate cost effective replacement or  
6 repair options to eliminate this leakage.

7 MEMBER MAYNARD: This one when I read this  
8 the first time, I was more excited than after the  
9 second time.

10 (Laughter.)

11 MEMBER MAYNARD: I see a commitment to do  
12 an engineering study, but the way I read this that's  
13 not necessarily a commitment to actually --

14 MR. SIEBER: Do anything.

15 MEMBER MAYNARD: -- do anything. Would  
16 you clarify that?

17 MR. GALLAGHER: I will clarify that. I  
18 mean our intent is to find a solution here. As we  
19 talked about last time to the subcommittee and Dr.  
20 Bonaca, this is a difficult repair situation. So we  
21 want to find a solution. We want to implement a  
22 solution and that's what this is about. Will we find  
23 a solution that's cost effective? I hope so and  
24 that's what we're trying to do.

25 MR. SIEBER: And right now, you're using

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1 duct tape and paint, right?

2 MR. GALLAGHER: We're using strippable  
3 coating and metallic tape. That's correct.

4 MEMBER MAYNARD: I'll tell you. My issue  
5 is I understand that right now the leakage is within  
6 the capacity of the drain. However, the drain is  
7 there as a backup in case there's a failure of some  
8 components, some leakage, unexpected leakage or  
9 whatever. So by counting on that as part of normal  
10 operations, you've reduced your margin to any  
11 additional leakage or whatever.

12 The system, the design intent, is to not  
13 have any leakage and it is bothersome to still have  
14 some leakage and be willing to live with that. I know  
15 that you would like to fix it. I'm just not sure that  
16 -- We'll have to see how others feel about how  
17 strongly the stuff is here. I appreciate what you're  
18 doing here.

19 MR. GALLAGHER: We believe the feedback we  
20 did get from Dr. Bonaca was that cost effective could  
21 come into it. I do have our Senior VP here, Rich  
22 Lopriore, who he is behind this 100 percent and wants  
23 to make sure we find a solution.

24 MR. LOPRIORE: Yes. I'm not as tall as  
25 the other guy.

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1 MR. GALLAGHER: This is Rich Lopriore, our  
2 Senior VP.

3 MR. LOPRIORE: I'm Rich Lopriore, the  
4 Senior VP from Mid Atlantic Operations. I am  
5 responsible for Oyster Creek in my area of  
6 responsibility. We agreed. We certainly want zero  
7 leakage and that is fundamentally what these studies  
8 are going to do.

9 But we want to make sure we know what is  
10 the right approach to this. I think at this point  
11 without studying this further, we don't know exactly  
12 what that is. It could be a membrane. It could be  
13 welding a new skin, but there are complications with  
14 all of that.

15 So it's not for not wanting to put  
16 investment into the plant. We clearly want to invest  
17 in the plant and we share the Committee's concern  
18 about wanting to achieve zero leakage. We will pursue  
19 that very vigorously and come up with the right  
20 answer. In the meantime, we do agree that we have a  
21 way to manage and by no means does that mean it's  
22 going to stop us from trying to get zero leakage.

23 MEMBER MAYNARD: I understand and I  
24 appreciate that and I can understand the difficulty in  
25 making a commitment doing something that you don't

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1 know what the answer is. So I understand that, too.

2 MR. SIEBER: The problem is not as simple  
3 as it may first appear because of the stresses. You  
4 can't weld on that very well. This isn't the only one  
5 that leaks. That's exactly what we've said. This is  
6 not a unique problem. On the other hand --

7 CHAIRMAN SHACK: You've got to permit it  
8 after it's fixed.

9 MR. SIEBER: Yes.

10 MEMBER MAYNARD: It's a building where  
11 you're relying just one drain, too.

12 CHAIRMAN SHACK: That's the other thing.  
13 I was going to ask if anybody put a ball bearing on  
14 that lip up there just to see how well it rolls  
15 around. One drain?

16 MR. POLASKI: The design -- This is Fred  
17 Polaski. The design of that is about a two inch drop  
18 away from the side 180 degree away from the drain to  
19 the drain. The design, I can't guarantee that it's  
20 two inches, whatever the design was. So that built  
21 into the design.

22 MEMBER MAYNARD: And it should be higher  
23 on the side that doesn't have the drain.

24 (Laughter.)

25 CHAIRMAN SHACK: I hope it's better than

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1 my gutters.

2 MR. SIEBER: Yes. In any event, I  
3 consider this a challenge to you and I'm interested in  
4 it. So I will follow what it is you do to solve the  
5 problem.

6 MR. GALLAGHER: Okay. We understand.

7 MEMBER ABDEL-KHALIK: Is that area of the  
8 damaged lip accessible?

9 MR. POLASKI: The area of the damaged lip  
10 when they did the repairs, they had to cut actually  
11 holes in the, I call it, the floor in the reactive  
12 cavity to gain access to that. It's not readily  
13 accessible. The way they do the visual is through  
14 four scope of fiber optics up through the drain line  
15 to see in that area. Difficult to get to.

16 MEMBER ABDEL-KHALIK: Have you considered  
17 increasing the height of that lip?

18 MR. GALLAGHER: We repaired the lip is  
19 what we did and as we said in this outage, we showed  
20 that all the leakage was controlled and not going into  
21 the sand bed region. So we think we have that lip  
22 fixed. This is really get back up -- You know, the  
23 feedback we got from you all was getting back up to  
24 stop it from getting there in the first place and  
25 that's what we're going to focus on in this study.

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1 MEMBER ABDEL-KHALIK: Thank you.

2 MR. O'ROURKE: Moving on. Slide 33. The  
3 next subcommittee comment that I will address is the  
4 monitoring of the drywell shell thickness should be  
5 more aggressive in the short term. At the  
6 subcommittee meeting on January 18th, we did not  
7 adequately explain the breadth and frequency of our  
8 monitoring activities. We prepared a summary of these  
9 activities and provided them to the Committee as a  
10 handout and that's the 11" X 17" that I referred to  
11 earlier. I'll discuss the monitoring in detail using  
12 your handout and the next slide.

13 This slide summarizes the monitoring  
14 activities for the drywell shell beginning with the  
15 activities performed during the most recent outage  
16 through the period of extended operation. The table  
17 is divided up into four major areas. The first area  
18 contains the activities we used to verify that there  
19 is no water leakage into the sand bed region.

20 The second area identifies the upper  
21 drywell shell monitoring. As we had previously  
22 described to the ACRS subcommittee, the monitoring  
23 locations for Item 2 were established based on  
24 extensive examinations performed over several years.  
25 Once the monitoring locations were established,

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