

Official Transcript of Proceedings  
NUCLEAR REGULATORY COMMISSION

Title: Advisory Committee on Reactor Safeguards  
Plant License Renewal Subcommittee

Docket Number: (n/a)

Location: Rockville, Maryland

Date: Friday, October 22, 2010

Work Order No.: NRC-505

Pages 1-156

**NEAL R. GROSS AND CO., INC.**  
**Court Reporters and Transcribers**  
**1323 Rhode Island Avenue, N.W.**  
**Washington, D.C. 20005**  
**(202) 234-4433**

1 UNITED STATES OF AMERICA

2 NUCLEAR REGULATORY COMMISSION

3 + + + + +

4 ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

5 (ACRS)

6 + + + + +

7 PLANT LICENSE RENEWAL SUBCOMMITTEE

8 + + + + +

9 FRIDAY

10 OCTOBER 22, 2010

11 ROCKVILLE, MARYLAND

12 + + + + +

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

17 SUBCOMMITTEE MEMBERS:

18 MARIO V. BONACA, Chairman

19 J. SAM ARMIJO, Member

20 CHARLES H. BROWN, Member

21 JOY REMPE, Member

22 MICHAEL T. RYAN, Member

23 WILLIAM J. SHACK, Member (via telephone)

24 JOHN D. SIEBER, Member

25 JOHN W. STETKAR, Member

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25

DESIGNATED FEDERAL OFFICIAL:

PETER WEN

C-O-N-T-E-N-T-S

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25

Opening Remarks and Objectives ..... 4

Staff Introduction ..... 5

Background and Major Difference Between 2005 and 2010  
 Versions ..... 10

Electrical AMPs ..... 33

Structural AMPs ..... 51

Break ..... 71

Mechanical AMPs and TLAAs ..... 72

Subcommittee Discussion ..... 153

Adjournment..... 156

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

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

8:30 a.m.

CHAIRMAN BONACA: Okay. The meeting will now come to order. This is a meeting of the Plant License Renewal Subcommittee.

I am Mario Bonaca, chairman of the subcommittee. ACRS members in attendance are Sam Armijo, Jack Sieber, John Stetkar, Joy Rempe, Michael Ryan and Mr. Brown.

Dr. Bill Shack is not present, but he's attending the meeting through teleconference. Peter Wen of the ACRS staff is the designated federal official for this meeting.

The purpose of this meeting is to review the Draft Revision 2 to NUREG-1801, "Generic Aging Lessons Learned Report," and NUREG-1800, "Standard Review Plan for License Renewal."

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

The subcommittee will gather information, analyze relevant issues and facts, and formulate

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

[www.nealrgross.com](http://www.nealrgross.com)

1 proposed positions and actions as appropriate for  
2 deliberation by the full committee.

3 Rules for participation in today's meeting  
4 have been announced as part of the notice of this  
5 meeting previously published in the Federal Register.

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

14 We will now proceed with the meeting and I  
15 call upon Mr. Brian Holian of the NRC, the Office of  
16 Nuclear Reactor Regulation to begin.

17 Mr. Holian.

18 MR. HOLIAN: Good. Thank you, Chairman.  
19 And thank you ACRS members and subcommittee for taking  
20 the time today to review the GALL report.

21 This report, the staff is happy, only  
22 comes around every five years or so. It's an awful  
23 lot of work. As you see, it's an awful big document.  
24 Yet, it's very useful work, and we'll get into that  
25 today.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1           The GALL is a useful tool for us. It's  
2 proven to be a useful tool. We've seen the ACRS  
3 support for the origination of the GALL years ago and  
4 your help towards kind of helping us push applicants  
5 towards use of the GALL.

6           It has proven to be a very efficient tool  
7 as you look backwards over five to seven years on both  
8 the applicants for them to come in with a known aging  
9 management program that is acceptable to the staff and  
10 at least use that as a starting point. And so, its  
11 application has been well used by them and by us.

12           We do realize that it needs to be updated,  
13 and so we take that project on seriously. The  
14 operating experience in some ways, I wish I could fold  
15 it in on a yearly basis vice a five-year basis, and we  
16 do have the ability to do that.

17           It's our interim staff guidance procedure  
18 where we can use that, and that's one area that the  
19 staff, and we might touch on this at the end, is  
20 trying to be more efficient to be more timely in  
21 updates to guidance like this.

22           One area you're going to see discussed in  
23 great detail today is the buried piping, and we think  
24 that's a success story the way it worked through the  
25 GALL timing here, you know.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1           In some ways, we're leading the NEI  
2 industry initiative in that and that's still coming  
3 down in Part 50's phase, but it's the right thing to  
4 be doing in Part 54 to be addressing it now with this  
5 revision of the GALL. And so, you'll see that.

6           I did want to just do introductions, and  
7 then I'll turn it over to the staff and we'll start  
8 kind of like the process this morning to get through  
9 probably 45 slides or so that we have.

10           First to my left is Melanie Galloway.  
11 She's the deputy in Division of License Renewal and  
12 we're glad to have her here today. Melanie is also  
13 since she's been in the division, been really  
14 overseeing aspects of what we've called the  
15 consistency or how are we dealing with some of these  
16 GALL updates for the 15 applications that are in-house  
17 now. So, that's something we'll address towards the  
18 end of the presentation.

19           I wanted to highlight Jerry Dozier, branch  
20 chief in Division of License Renewal. Jerry was  
21 around for the first GALL update. So, there's not  
22 many of us that were at least in - and we've been at  
23 the NRC, but maybe not in License Renewal. But Jerry  
24 and some of his staff - you'll hear from Amy Hull from  
25 research, a couple key staff that were here at Rev.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 GALL 1 update. So, that's been proven to valuable.

2 We actually pulled Jerry out of his branch  
3 chief role for about six to seven months. Had a  
4 substitute branch chief in for his branch so he could  
5 concentrate his energies and oversight into the GALL  
6 update in particular and that was valuable to us.

7 Also at the table is Bob Gramm. Bob's a  
8 senior reviewer and senior engineer in License  
9 Renewal. He's had a longtime experience in NRR in  
10 many different divisions. And we've been glad to have  
11 him in License Renewal for the last year-and-a-half,  
12 two years, and immediately we put him on the GALL  
13 update over a year ago. So, Bob has taken the bulk of  
14 the organization and the impetus for getting this  
15 done.

16 I would also like to highlight before  
17 turning it over to staff, industry representatives  
18 that are here today. They're not on a panel. They're  
19 here. I've talked to them. There's been an awful lot  
20 of industry interaction.

21 Julie Keys is here from NEI, and several  
22 individuals from the plants that have worked with us  
23 really as GALL went out for public comment, at least  
24 available for comment, back in January.

25 So, we've been getting those comments in

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 and it's been very fruitful; one, for the industry to  
2 see them up there, the staff's original thoughts up  
3 there on the web, and then we've had organized  
4 meetings that I'm sure Bob will cover.

5 The second introduction I'd like to make  
6 is just if you see a couple individuals come into the  
7 room, for the ACRS members, they're from the IRRS  
8 team. The International Regulatory Review team is on  
9 site. 15 to 20 people from overseas organized through  
10 the IAEA, they've been taking NRR - primarily NRR  
11 through its paces this week, and they're back next  
12 week for a two-week mission.

13 So, I highlighted the fact that ACRS is in  
14 town and they might want to stop by and at least  
15 observe part of this meeting. They may come over  
16 about ten o'clock, but it's the team leader Jukka  
17 Laaksonen from Finland, and Gustavo Caruso from the  
18 IAEA.

19 So, they were hoping to at least see on a  
20 break and maybe observe parts of this meeting. GALL  
21 was an item we discussed with them as part of our good  
22 practices, how we see it and how we do aging  
23 management in the United States.

24 With that, I'll turn it over - while  
25 Jerry's up there, I'm going to turn it right to Bob

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 Gramm who's going to start the presentation.

2 Bob.

3 MR. GRAMM: Thank you, Brian. Hello, Mr.  
4 Chairman and other members.

5 We're happy to be here today with you to  
6 discuss our two draft documents that have been  
7 prepared by a large number of staff members over, as  
8 Brian said, a course of a year-and-a-half.

9 I was the project manager for that effort  
10 and I'm happy to be here on behalf of all the folks to  
11 do the macro presentation. And we will provide you  
12 with many of the details and get into the substance of  
13 the documents as we go through our discussion this  
14 morning.

15 CHAIRMAN BONACA: Let me just add that  
16 there is one document, NUREG-1950, that we have not  
17 seen. And I understand what I see from your slides,  
18 that you reference that.

19 So, I would like to know at some point  
20 what kind of limitation that represents for us in  
21 writing a letter, if any.

22 MR. GRAMM: We can discuss that and we have  
23 a couple of slides and we can get into those  
24 particular aspects of that companion NUREG.

25 Again, 1950 is not a guidance document.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 It serves as a knowledge management transfer tool to  
2 articulate the bases for our decisions and some of the  
3 public comment resolutions, but we'll cover that.

4 CHAIRMAN BONACA: All right.

5 MR. GRAMM: This slide serves as a roadmap  
6 for our presentation. So, it identifies the topics  
7 and the presenters that you'll be hearing from this  
8 morning as we go through the various subject matter  
9 materials.

10 We will selectively focus on a few AMPs  
11 and provide greater details and elaboration to the  
12 changes, because we feel that there's been extensive  
13 interactions on some of those and that they're worthy  
14 of further discussions.

15 And so, there's many AMPs that we will not  
16 discuss, but they were - but changes were made. We  
17 believe we've got a good basis for those, but we will  
18 simply focus on things that we feel are appropriate  
19 for the course of this meeting.

20 We will drill down in the area of, for  
21 example, electrical aging management programs in the  
22 submerged cables, and we'll give some elaboration on  
23 buried piping and tanks aging management program,  
24 which was changed extensively based primarily on  
25 operating experience, as Brian indicated.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1           Each document has a list of participants.  
2           There were over 90 staff members supplemented by  
3 experts from our contractor, Advanced Technologies and  
4 Laboratories.

5           These people have worked very hard over a  
6 year-and-a-half and have come together in expert  
7 panels where we basically synthesized information from  
8 these folks. And they gathered together, as we  
9 discussed, the proposed changes as we evaluated public  
10 comments. And we brought together the best expertise  
11 that we could from a variety of headquarters  
12 organizations both within NRR, Division of License  
13 Renewal and Office of Research.

14           We also had the benefit of inspection  
15 expertise, and all of that collectively was brought  
16 together to bring forward the draft documents that you  
17 see.

18           So, it's not a product of any one  
19 individual, any one part of the organization, but was  
20 in fact a very collegial effort that we arrived at  
21 these changes.

22           As Brian indicated, we've had extensive  
23 interaction with industry, and this has been very  
24 constructive. Even in 2009 before we published drafts  
25 of these documents on the web, we received several

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 letters from industry with proposed changes to the  
2 documents, suggested changes. This came in from both  
3 NEI, as well as from EPRI, with suggestions for PWR  
4 internals.

5 We took those comments into consideration  
6 as we moved forward, and that provided a good first  
7 step.

8 We held two multi-day workshops in  
9 January, and then later on in May, to discuss the  
10 various drafts of these documents. And we had very  
11 fruitful interactive discussions with members of the  
12 public that involved not only industry, but other  
13 interested external stakeholders participated in  
14 those. And we had very constructive feedback and a  
15 good dialog.

16 It was an opportunity for the staff to  
17 present the basis for why we were making changes so  
18 the industry could better understand some of the  
19 products we were putting forward, as well as the  
20 industry could comment upon how the effects of the  
21 documents - how the document changes would affect them  
22 in real practice.

23 We had a formal 45-day comment period.  
24 There was ten formal letters that came back. Most  
25 were from industry, but we did have other interested

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 external stakeholders provide comment letters.

2 And then, lastly, we held several public  
3 meetings and telephone conferences to discuss the  
4 buried piping and tanks aging management program.

5 So, there were a number of iterations late  
6 in the process on that document, and it received quite  
7 a bit of attention late in the comment phase.

8 CHAIRMAN BONACA: Well, at some point we  
9 will appreciate there were a number of programs that  
10 five years ago the most expectation there was would be  
11 a onetime inspection, which essentially is a  
12 presumption that you confirm that the effect is not  
13 taking place.

14 Some of those programs have evolved now  
15 into full programs with multiple inspections, which  
16 means we have learned in the past five years that the  
17 problem is more widespread and more common.

18 And, you know, where there are examples of  
19 those, it would be appreciated if you can bring it up  
20 when you go through the presentation.

21 MR. GRAMM: Okay. These are some of the  
22 forcing functions behind the changes. Again, it was a  
23 domestic and foreign operating experience.

24 So, we actually backtracked into 2004 to  
25 ensure that we received a proper consideration of the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 overlap of operating experience that may have come to  
2 light during the course of preparation of Revision 1.

3 We carried forward through 2009,  
4 essentially, for the cutoff point. Again, we looked  
5 at databases both of domestic and foreign experience.

6 Also took into account personal experience from many  
7 of the reviewers.

8 We looked very hard at license renewal  
9 applications in the accompanying safety evaluation  
10 reports to apply precedence, lessons learned from  
11 those applications and fold that into the documents.  
12 Again, the comments we received from industry were a  
13 very important consideration.

14 Interim staff guidance documents, there  
15 were several that were folded in and changes made. In  
16 particular, a new AMP was created, AMP M41, as a  
17 result of ISG. And there were other changes both in  
18 the electrical and structural areas from these interim  
19 staff positions that have been put forward.

20 And of course we accounted for any changes  
21 of regulations and new industry guidance documents  
22 that have become available over the intervening five-  
23 year period since Revision 1 was published.

24 MEMBER ARMIJO: Bob, are you going to cover  
25 the extent of information you've received from foreign

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 operating - from foreign plants, Asia, Europe and so  
2 on?

3 MR. GRAMM: Not in detail.

4 MR. DOZIER: Actually, I can address just  
5 one of those.

6 Before we did the License Renewal Guidance  
7 update, we did an extensive review of foreign  
8 operating experience.

9 You may be familiar with the IRRS database  
10 that the IAEA manages. We have reviewed that  
11 document. And an example of one of the things that we  
12 identified was that stress corrosion cracking  
13 occurring in stainless steel in an outside - in an  
14 outside environment had happened at one plant.

15 Basically, we made a new aging management  
16 review line item for that particular experience, but  
17 that - other than the international experience, we  
18 also looked at license reports, inspection reports to  
19 gain our in-house operating experience as well as  
20 foreign.

21 MEMBER ARMIJO: Okay. Thank you.

22 MR. DOZIER: Yes.

23 MR. GRAMM: Some of the very high-level  
24 changes that were made to the standard review plan  
25 were for Appendix A, which defines a template of ten

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 elements for aging management programs.

2 We went and reformatted material,  
3 augmented and changed that information, and then  
4 utilized that to rewrite the contents of the GALL  
5 report AMPs themselves.

6 So, the template was revised. And then  
7 that flowed through for consistency changes through  
8 the actual AMPs.

9 As applicants proposed plant-specific  
10 programs, they will now follow that general template  
11 that's available in the standard review plan as well.

12 Of course the standard review plan rolled  
13 out the changes we had made throughout the GALL  
14 report. So, in some situations we found that further  
15 evaluation was no longer required because we had  
16 either augmented the AMP or had gained confidence in  
17 the ability of the AMP to manage aging effects.

18 And so, there's a lot of textual material  
19 on further evaluations no longer present, because it's  
20 not deemed necessary in the standard review plan.

21 And all the tables in the standard review  
22 plan were aligned with the accompanying AMR line item  
23 changes. And so that we worked on the GALL first, and  
24 then flowed those changes back into the standard  
25 review plan and ensured consistency between the two

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 documents.

2 I'm going to turn it over now to Erach  
3 Patel. Erach has also brought a lot of corporate  
4 memory from Revision 1. He is a - works for Advanced  
5 Technologies and we've been very fortunate to have him  
6 as part of the Revision 2 update process.

7 And he's going to explain the general  
8 changes we made to the GALL report, and then we'll get  
9 into later on discipline-specific changes we made in  
10 various functional areas.

11 MR. PATEL: Thank you. Good morning.

12 2005 GALL was in two parts, in two  
13 volumes, Volume 1 and Volume 2. A lot of information  
14 in Volume 1 was repeated in the SRP, and some of it  
15 was in the GALL report.

16 So, this time we consolidated two reports.

17 We took the background information and some pertinent  
18 to application - of the GALL report information and  
19 put it in the GALL report itself.

20 And some portions of the table we took out  
21 of the GALL Volume 1 and put it in the SRP table with  
22 the result of we were able to eliminate Volume 1 and  
23 have only one GALL report come out of it.

24 The other change that we made was in the  
25 first chapter in the GALL report talks about

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 application of the ASME Code. And we are now using  
2 the 2004 edition of the code.

3 And we also clarified based on our  
4 experience with the applications, the use of Code  
5 Cases and Relief Requests.

6 Some of the other information we put in  
7 there as Bob and Jerry mentioned, relevant operating  
8 experiences plugged into the report. We aligned the  
9 AMP content a little bit better for the 10-element  
10 template in some cases in Volume 1.

11 In 2005 edition, information that should  
12 be detection of aging effects was put into monitoring  
13 and training. So, we reviewed that and put it  
14 properly into each element as it applies and edit 2004  
15 edition under code where it was applicable.

16 And we added a preamble in Chapter 11  
17 where some of the industry documents got changed. So,  
18 we wanted to make sure we put some guidance into the  
19 GALL report so that when the applicant puts the  
20 application together, they have an idea of what  
21 revisions to use, etcetera.

22 A new subsection was added. This is a  
23 part of the system that are in the COL for license  
24 renewal, 10 CFR 54.21 RFR 2, which is the non-safety  
25 systems that would come under the scope of license

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 renewal because they impact safety components.

2 We didn't have this code in 2005. So, we  
3 added a new subsection to include the systems in  
4 there.

5 Some of the other things we did based on  
6 our experience with review of the SER over the last  
7 several years, is in 2005, for example, we had water  
8 chemistry and we had said verification for  
9 effectiveness and further evaluation required.

10 All of the applicants had been using  
11 onetime inspection as protocol M11, M32, and we've  
12 accepted that in the past.

13 So, in this revision what we've done is if  
14 they use water chemistry and onetime inspection, then  
15 we don't need further evaluation.

16 So, we made changes to reflect that. So,  
17 we reduce the number of further evaluation based on  
18 our work review of the applications.

19 Some of the other thing we did was in some  
20 cases we have plant-specific programs called out. For  
21 example, for Boraflex we didn't have a program for  
22 that. We now have a program in the GALL report. So,  
23 we call that program out, and therefore we don't need  
24 a plant-specific program.

25 MR. MEDOFF: Erach, can I make a

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 clarification? Because I think we've got a couple --

2 MR. GRAMM: Make sure they know who you  
3 are.

4 MR. MEDOFF: Hi. This is Jim Medoff of  
5 the staff. One thing I wanted to clarify is when  
6 Erach was talking about the consolidation of the two  
7 prior GALL versions and the SRP, and now you only have  
8 one SRP and one GALL, let me clear that up a little  
9 bit for you.

10 In the AMR tables of - in the old version  
11 in the AMR tables of the SRP, in the AMR tables of  
12 GALL 1, they were almost identical except for a couple  
13 of differences.

14 Therefore, what was happening was you had  
15 the SRP refer to the tables in GALL 1, and then the  
16 generic line items in GALL 1 would break out which  
17 more plant-specific line items in GALL 2 were derived  
18 from them.

19 What we did is we consolidated the tables  
20 in the SRP in GALL 1 to match up so that we didn't  
21 need to have an extra document. So, right now what  
22 happens is they're all - we consolidated them so that  
23 right now the SRP points to the more plant-specific  
24 line items in the GALL that are derived from those  
25 line items.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1           So, we don't have to go between three  
2 different documents now. We can go from the SRP  
3 directly to GALL 2 to figure out which plant-specific  
4 items are derived from the more global, larger-scale  
5 items in the SRP.

6           MR. GRAMM: Okay.

7           Thank you, Erach.

8           John.

9           MEMBER STETKAR: Yes, I had a couple of  
10 questions on definitions. And I know you're going to  
11 jump into the individual AMPs here pretty soon. So,  
12 can I get those out of the way since it's kind of the  
13 front end of the document.

14           And I don't know if Erach's the  
15 appropriate person or -

16           MR. GRAMM: Well, either Erach or Amy who's  
17 sitting directly behind you -

18           MEMBER STETKAR: Excellent.

19           MR. GRAMM: - would be the owner of the  
20 information.

21           MEMBER STETKAR: The one I got most  
22 confused about, and this is just perhaps personal  
23 education, was in Section 9D where you're defining  
24 environmental conditions, there's one environment  
25 called an uncontrolled indoor air greater than 35

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 degrees C, greater than 95 degrees F.

2 And in the current definition it says in  
3 this environment, any resultant thermal aging of  
4 organic materials can be considered as insignificant  
5 over the 60-year period of extended operation.

6 And there's a reference. The reference  
7 happens to be to a metals handbook. So, I don't know  
8 what that has to do with organic materials.

9 In Rev 1 of the GALL report in the same  
10 definition, it says if ambient is less than 95  
11 degrees, then any resultant thermal aging of organic  
12 materials can be considered to be insignificant over  
13 the 60-year period.

14 So, for some reason we've gone from a  
15 definition that says if I'm less than 95 --

16 MR. GRAMM: Covered all the way.

17 MEMBER STETKAR: - I'm okay, but I need to  
18 worry about it if over - but I need to worry over 85.

19 Where in Rev 2 it specifically says if it's over 95,  
20 I'm okay, but I need to worry about some other types  
21 of aging mechanisms.

22 Is that a simple typo or -

23 MR. DOZIER: Yes, sir.

24 MEMBER STETKAR: Okay. Please correct  
25 that.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 MR. DOZIER: The greater than 95 degree  
2 threshold, we primarily use that for elastomers.

3 MEMBER STETKAR: Yes.

4 MR. DOZIER: Okay. And we're saying carbon  
5 materials, but primarily we're saying elastomers.

6 MEMBER STETKAR: Yes.

7 MR. DOZIER: So, it is greater than 95  
8 degrees when we do have that affect and the aging  
9 should be managed.

10 MEMBER STETKAR: Check that then -

11 MR. DOZIER: Okay.

12 MEMBER STETKAR: - because some people  
13 might read that and say oh, my God, you know, these  
14 people got really smart and I don't need to worry  
15 about a bunch of things now in certain parts of the  
16 plant if they actually read all of these definitions.

17 It's nine, you know, IX D for air indoor  
18 uncontrolled greater than 35 degrees C.

19 MR. GRAMM: Thank you.

20 MEMBER STETKAR: I just thought maybe the  
21 thinking had changed, but - the other one, and this is  
22 more minor, it's more stylistic, in 9F under Aging  
23 Mechanisms where you talk about water trees, there it  
24 says water trees occur when the insulating materials  
25 are exposed to long-term continuous electrical stress

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 and moisture.

2 And there's - it goes on. The thing I  
3 hung up on was the "continuous" term because there's  
4 been a long discourse about whether or not the cables  
5 need to be energized and what fraction of time they  
6 need to be energized.

7 And I thought that the current thinking,  
8 at least, is that we're de-emphasizing the fraction of  
9 time that they're energized, and yet the definition  
10 seems to focus on continuously energized cables.

11 So, I don't know whether you need to think  
12 about that. Again, it's just in terms of people  
13 scoping in particular cables. If it says only worry  
14 about energized cables, that's different.

15 MEMBER SIEBER: And now we say -

16 MEMBER STETKAR: It was traditionally 25  
17 percent or more of the time for medium-voltage cables.

18 Now, we'll see this morning that we're extending the  
19 scope down to lower-voltage cables. And I thought we  
20 were removing that criterion of there being energized  
21 some fraction of the time.

22 We're just looking at cable insulation in  
23 a particular environment. So, you might want to  
24 clarify that.

25 MS. HULL: Yes, we will double-check this

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 in the context of the revised AMPs.

2 MEMBER STETKAR: Thank you.

3 MR. GRAMM: Actually, Cliff Douth from our  
4 electrical group -

5 MR. DOUTH: Cliff Douth, DLR.

6 MR. GRAMM: Move that up. You've got to  
7 talk right into it.

8 MR. DOUTH: Cliff Douth, DLR. It shouldn't  
9 - you're correct. The "continuous" there was - it  
10 should be the cable needs to be energized and subject  
11 to moisture, but not necessarily continuous.

12 MEMBER STETKAR: Yes, I think if you just  
13 take out the "continuous" term, it reads fine and  
14 avoids that potential source of confusion. Thanks.

15 MR. GRAMM: Thank you.

16 MEMBER STETKAR: You're welcome.

17 MR. GRAMM: I'm now going to turn it over  
18 to Amy Hull from the Office of Research, and she's  
19 going to speak to what we call the consolidated NUREG-  
20 1950. And again, this is a knowledge management  
21 transfer where the staff can articulate the bases for  
22 our decision making and it captures all the public  
23 comment dispositions.

24 Amy.

25 MS. HULL: Okay. NUREG-1950 is evolution

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 from what we had in 2005. In 2005, we had 1833, the  
2 basis document, and we had 1832 which was focusing on  
3 the public comments.

4 We didn't have a very good tie-in between  
5 the two documents, 1832 and 1833. There was some  
6 duplication. There was some redundancy. When you  
7 count the number of pages between those two volumes,  
8 it was about 1,376.

9 With what we're putting together now - and  
10 here's the draft - it's about 920 pages. It's much  
11 easier -

12 (Off-record comments.)

13 MEMBER STETKAR: No wonder I got through it  
14 so quickly.

15 MS. HULL: It's a 33 percent reduction in  
16 total pages.

17 As Bob mentioned earlier, the basis  
18 document and the disposition of the public comments is  
19 really useful as a knowledge management transfer tool.

20 It's not used so much on a day-to-day, year-by-year  
21 basis. It's very, very useful when you come in five  
22 years later and see why things were changed.

23 With my work in research, I usually used  
24 the Excel spreadsheet, the GALL master, to determine  
25 what was being done and it's very, very valuable.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1           The basis document, NUREG-1833, was good  
2 as a double-check of what ultimately was done in  
3 NUREG-1800 and 1801. I mention that because there is  
4 some question about whether NUREG-1950 was ready to be  
5 reviewed at this point.

6           NUREG-1950 lags behind 1801 and 1800  
7 reflecting what has changed in them, why it was  
8 changed, the consistency. Because if it's not the  
9 same time and there are changes in 1800 and 1801 that  
10 are not captured in 1950, it loses some of its  
11 utility.

12           So, I wanted to mention that up front.

13           CHAIRMAN BONACA: That's the reason why I  
14 raised the question. If, in fact, 1950 has the logic  
15 behind the reasons for the change, that is forcing us  
16 to make a judgment without the help of the document.

17           MS. HULL: It does contain the logic. The  
18 logic has also been presented at the public meetings  
19 and has been presented in the presentations that  
20 individuals are giving to you today.

21           MR. DOZIER: For the basis document - we  
22 did summarize the information that was in the basis  
23 document in a presentation that was given to the ACRS  
24 that provided the changes that occurred.

25           We knew that when you picked up a document

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 like this, you know, you would want that information  
2 sanitized. So, we tried to provide a summary to the  
3 ACRS members of when we - when we gave the initial  
4 document.

5 If you would like to see the draft as we  
6 have it, you're welcome - in 2005, however, when the  
7 letter was written from ACRS, it did reflect the GALL  
8 report and the standard review plan. It only talks  
9 about this document as a reference.

10 Does that - would that - is that what  
11 you'd like?

12 Would you like a copy of this?

13 MEMBER STETKAR: Yes.

14 CHAIRMAN BONACA: Yes.

15 MEMBER STETKAR: Some of us at this table  
16 were not here in 2005.

17 MR. DOZIER: We'd be glad to provide that.

18 CHAIRMAN BONACA: I mean, I'm not  
19 uncomfortable with the basis for the changes that you  
20 have presented - that you are presenting today, okay,  
21 because we have gone through this license renewal.  
22 So, we know why certain things happen and the history,  
23 etcetera.

24 But when you're telling me that you have  
25 the basis for the changes summarized inside a

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 document, I get, you know, just my appetite goes up.

2 (Laughter.)

3 MS. HULL: It's still a living document.  
4 It's still being processed as we speak.

5 MR. GRAMM: Yes.

6 MS. HULL: We're still making changes and  
7 digesting information and -

8 MR. DOZIER: When we update these  
9 documents, of course when we make changes to the GALL  
10 report, the GALL report tables changes, the standard  
11 review plate changes. And then following all of that,  
12 this document, our basis document changes.

13 So, that's why she talks about this  
14 lagging information. But, as I said, we'll be glad to  
15 provide you with a draft, realizing that this is a  
16 draft and we're working hard to complete this for  
17 publication in December.

18 CHAIRMAN BONACA: But as a minimum, I  
19 think, you know, we will have to provide the full  
20 committee with our judgment regarding whether or not  
21 we should postpone the issuance of the letter after we  
22 review the document, or if we feel that we have  
23 sufficient information to go ahead and produce a  
24 letter now.

25 MEMBER ARMIJO: Well, it is kind of funny

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 that the basis document is not being reviewed if  
2 that's the foundation for the standard review plan and  
3 the GALL report.

4 If it's a supplementary thing of  
5 basically, you know, capturing information, that's a  
6 different story. I'm not so uncomfortable. I'm  
7 interested in it, but I don't feel it's mandatory.

8 MR. DOZIER: It does provide - as Amy had  
9 talked, it does provide - it is not considered a -  
10 when we talk about license renewal guidance, we're  
11 talking about the GALL report and standard review  
12 plan.

13 This is our - this is our knowledge  
14 transfer tool to get to that information so that in  
15 the future we'll know why we made the changes that  
16 have occurred.

17 And, also, it, as I said, in the 2005  
18 letter from the ACRS endorsing these documents, they  
19 did provide this reference. but we were not  
20 specifically asking the ACRS to endorse this  
21 particular document, because it was not guidance.

22 But we'll be glad to provide the  
23 information to you and also help you - help in any way  
24 we can in digesting this information.

25 MEMBER ARMIJO: Is there a timeline on 1950

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 when it will be ready or -

2 MS. HULL: It will be published in - at the  
3 end of 2010 along with 1800 and 1801. Jerry can speak  
4 to it more.

5 CHAIRMAN BONACA: I think what we should  
6 do, we should get this to the members of the  
7 subcommittee and, you know, we have a chance to go  
8 through, look at some examples and then make a  
9 judgment.

10 And I think that we should be on track  
11 with representation the next meeting anyway. The  
12 issue is going to be are we ready to write the letter  
13 or should we review this document.

14 MEMBER STETKAR: We can probably discuss  
15 that, you know, at the close out of this session  
16 whether -

17 CHAIRMAN BONACA: Yes.

18 MEMBER STETKAR: - we think it's  
19 appropriate to go forward to the full committee or  
20 not.

21 CHAIRMAN BONACA: Yes.

22 MEMBER STETKAR: Okay. Thank you.

23 MEMBER SIEBER: Is the draft of NUREG-1801  
24 that we got about two weeks ago from Peter, is that  
25 the current GALL report that we're reviewing?

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MR. DOZIER: The ACRS was provided with  
2 NUREG-1800, 1801, which was -

3 MEMBER SIEBER: Rev 2.

4 MR. DOZIER: Right. And, like I said, a  
5 summary of the changes.

6 MEMBER SIEBER: Okay. So, we don't need -  
7 we don't need an additional copy of 1801 Rev 2.

8 MR. DOZIER: No.

9 MEMBER SIEBER: Right. Okay. We already  
10 have it.

11 CHAIRMAN BONACA: Okay.

12 MR. GRAMM: We're going to shift gears now  
13 and get into the electrical comments. I'm going to be  
14 joined by Matt McConnell and Cliff Douth who are going  
15 to make the presentation on electrical items.

16 We are going out of sequence here and we  
17 will cover the aging management program E3 first, and  
18 that's done on intention.

19 MR. DOUTH: Good morning. Cliff Douth from  
20 DLR. I'll do the - I'll essentially go through the  
21 AMPs.

22 As Bob said, we're starting with E3 first  
23 simply because that's the major change of most of the  
24 AMPs.

25 When we were doing this originally, it

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 became apparent that with operating experience and  
2 responses to Generic Letter 2007-01, that there were  
3 cable failures that were outside the recommendations  
4 of GALL E3 from the standpoint of 2K and up. So,  
5 that's the major change.

6 It's based on plant-specific and operating  
7 history starting with the, essentially way back, 2002-  
8 12 Information Notice on responses from the generic  
9 letter, some license to inspections and audits.

10 And in addition to that, we worked with  
11 the Division of Engineering electrical branch and  
12 Office of Research to revise the document to reflect  
13 what we think is current information.

14 MEMBER STETKAR: Cliff, before you get into  
15 this -

16 MR. DOUTT: Yes, sure.

17 MEMBER STETKAR: - just point of  
18 information, what's the status of the whole GL 2007-01  
19 process?

20 It's part of the current licensing --

21 MR. DOUTT: Right.

22 MEMBER STETKAR: - you know, issues.

23 MR. DOUTT: That's correct.

24 MEMBER STETKAR: What's going on?

25 We haven't heard anything about that other

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 than a presentation a while ago on -

2 MR. DOUTT: Do you want to do that, Matt?

3 MEMBER STETKAR: - the results -

4 MR. McCONNELL: That's fine.

5 MR. DOUTT: Okay.

6 MEMBER STETKAR: - of the survey and what  
7 people came back with.

8 MR. McCONNELL: Well, good morning. My  
9 name is Matthew McConnell. I work in the electrical  
10 engineering branch. I'm a senior electrical engineer  
11 in that branch in NRR.

12 Basically, Generic Letter 2007-01 has been  
13 reviewed by the staff. All the responses came in.  
14 And we actually responded to the licensees saying that  
15 they have submitted all the information that was  
16 necessary.

17 In, I believe it was, 2009, early, we  
18 issued a summary report that actually documented our  
19 findings. And there were some follow-up items that  
20 were very minute follow-up items, but they also  
21 included discussions on potentially going forward with  
22 developing test techniques and things like that. And  
23 that's where our Office of Research came in.

24 And right now we have already issued a  
25 NUREG-7000, which talks about the - it establishes

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 test practices or characteristics of effective  
2 monitoring and maintenance programs for cables.

3 The other aspect is there's a draft guide  
4 that's already out there that's - right now I think  
5 research is actually addressing the public comments on  
6 that guide. And that also addresses different  
7 techniques for testing of power cables and - but as  
8 far as Generic Letter 2007-01 goes, that is actually -  
9 that is resolved. That is considered closed.

10 MEMBER STETKAR: And there's no guidance  
11 that's gone out to currently operating plants with  
12 similar - similar guidance to what's in the GALL  
13 report now in terms of scope and frequency of  
14 inspections?

15 MR. McCONNELL: Nothing specific with the  
16 frequencies that we - that obviously the Part 50  
17 process is playing out and there is different guidance  
18 inspections taking place that are identifying  
19 different aspects in the - obviously in the submerged  
20 cable world.

21 MEMBER STETKAR: Okay. Thank you. Sorry  
22 about that.

23 MR. DOUTT: No, that's fine.

24 MR. McCONNELL: We were looking at it from  
25 the standpoint - we're looking at aging management and

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 aging effects.

2 MEMBER STETKAR: The only reason I bring it  
3 up is in some of our deliberations it's come up, you  
4 know, in terms of how should we - especially in a  
5 couple of letters we wrote, let's say, a couple of  
6 years ago, two, three years ago, because this was part  
7 of the current license, you know, was a current  
8 licensing issue, should we highlight it as an aging  
9 management concern or let the system play out, you  
10 know, for the currently operating plants.

11 So, that's - I was just curious as far as  
12 where that interface is right now.

13 MR. McCONNELL: Okay. Thank you.

14 MR. DOUTT: The only other - the other  
15 major change here, obviously, and you mentioned it  
16 earlier, was energize to de-energize.

17 We removed the criterion E3. The 25  
18 percent criterion is gone. We did that for two parts.

19 One is when we expanded the scope looking at those  
20 failures, that was not dependant on being energized or  
21 de-energized.

22 We had de-energized failures. So, it made  
23 sense to take care of the medium-voltage cable and  
24 remove that criteria as well.

25 So, that's another major change to that

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 document. And, again, that's essentially based on,  
2 again, operating experience that we have currently.

3 The other thing that - the other major  
4 change was in the cable test frequencies. That was  
5 changed to six years. It's mostly based on data that  
6 we had in generic letter response and operating  
7 experience. And it was just trying to cover that last  
8 five year - we had it at ten, which covered the end of  
9 the five-ten grouping. It just brings it forward.

10 There are some criterion there that that's  
11 based on operating experience. So, again, if you find  
12 - that's essentially a backstop at this point, but it  
13 could be different depending on plant specific and  
14 operating experience for different applications.

15 The inspection frequency for water  
16 collection was also revised. It was revised to one  
17 year instead of two. Our reason to do that was  
18 coupled.

19 One was that coincides with the inspection  
20 procedures that were issued by NRR, which looks at  
21 they sample two to four manholes per year. So, we  
22 coincide with that.

23 The other thing was is in the two-year  
24 frequency, we're looking at some operating experience  
25 where you would find the case where one year was fine,

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 went to two years, there was water in the manholes and  
2 it was repeating.

3 We didn't have an event driven, which  
4 we'll get to in a second, so we ended up with cables  
5 being submerged for significant periods of time. So,  
6 we brought that back, again another backstop, but  
7 again operating experience would dictate what the  
8 plant-specific frequencies would be.

9 The next thing is obviously event driven.

10 Again, it's operating experience. We found  
11 situations where depending on rain, flood, cases that  
12 without - you have a situation where you may have  
13 drains, you may have sump pumps, you may have alarms,  
14 but you may not.

15 So, this drives an inspection in case you  
16 have flooding or some event. It's triggered on  
17 whatever criteria the applicant comes up with. And  
18 we're invoked this to try to minimize exposure to  
19 significant moisture within the three-day definition.

20 MEMBER STETKAR: Will you in your reviews  
21 of the particular AMPs, be looking for how each  
22 applicant invokes that in event-driven part of the  
23 inspection program?

24 MR. DOUTT: We have looked at that. What  
25 you end up looking for is you go out and say okay,

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 look at operating experience, you know. Depending on  
2 what the configuration is, sump pumps, what type of  
3 covers, there's a different - is it susceptible to it,  
4 are there condition reports that indicate that that  
5 has happened, and then coordinate all the - then they  
6 end up coordinating, you know, you have to have event  
7 driven, you have to have inspection frequencies,  
8 whatever.

9 MEMBER STETKAR: I'm just, you know, in  
10 terms of looking at where we are now in sort of the  
11 history of what we've seen, I haven't seen a lot of  
12 pressure from the staff in terms of going back to  
13 applicants to say, you know, applicants - some  
14 applicants have come in and highlighted the fact that  
15 they do indeed have an event-driven inspection  
16 frequency. And, you know, the staff says, you know,  
17 well, that's good, basically.

18 But I haven't seen the staff going back to  
19 an applicant and saying, you know, have you identified  
20 a particular causal mechanism, you know, whether it's  
21 locations that are more susceptible to groundwater or  
22 whether it's event driven by, you know, rain or other  
23 types of precipitation.

24 I haven't seen the staff going back and  
25 sort of asking people to think about that box.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MR. DOUTT: Probably two parts. One is  
2 going forward in the last year and a half or so where  
3 based on information, we have asked that question.

4 MEMBER STETKAR: Okay.

5 MR. DOUTT: Going back on plants that are  
6 currently under review as part of this revision here,  
7 we have issued RAIs. Part of that RAI is to address  
8 event driven.

9 We haven't necessarily depending on the  
10 plant to say yes, we have an event-driven procedure  
11 that will invoke that if it - not necessarily the  
12 details of so many inches or whatever.

13 Some licensees have provided that  
14 information, others have not, but we're looking just  
15 for procedurally that it's accounted for, yes.

16 MEMBER STETKAR: So, we should expect to  
17 see more of that?

18 MR. DOUTT: You'll expect to see more, yes.

19 MEMBER STETKAR: Okay. Thanks.

20 MR. DOUTT: Let's see here. Other than  
21 that, there was some - we updated operating experience  
22 in this AMP just to cover what's currently happening.

23 So, there's references to the inspection procedure 06  
24 2007-01 NUREG-7000 input. And I think we jump to  
25 references.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1           There was a question as far as  
2 applicability goes. I think we - if you want, you  
3 know, we've discussed that in the past.

4           MEMBER STETKAR: There's one minor thing  
5 you might want to look at in the introduction to the  
6 AMP, the program description. I got a little bit  
7 confused because it says as stated in NUREG-CR5643, a  
8 major concern is failures of deteriorated cable  
9 systems, ya-dah, ya-dah, ya-dah, might be induced  
10 during accident conditions. Since the instrumentation  
11 cables and connections are not subject to the  
12 environmental qualification requirements, an AMP is  
13 required to manage the aging effects. This AMP  
14 provides reasonable assurance the insulation material  
15 for electrical cables will perform.

16           It sounds like something might have been  
17 excerpted.

18           MR. DOUTT: What happened here, there was  
19 the standard phrasing in all the AMPs.

20           MEMBER STETKAR: I know where it came from.

21           MR. DOUTT: That's what happened.

22           MEMBER STETKAR: You just might want to  
23 purge it.

24           MR. DOUTT: We caught it.

25           MEMBER STETKAR: Since you've already gone

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 down to 400 volts.

2 MR. DOUTT: Right. Right. In the copy I  
3 have, I think it's corrected.

4 MEMBER STETKAR: Okay. Thanks.

5 MR. DOUTT: Right.

6 Next. In no particular order, 11.E1,  
7 which is Insulation Material for Electrical Cables and  
8 Connections Not Subject to 50.49 requirements, there  
9 was - the only - the major change here was not really  
10 a major change. A clarification on adverse localized  
11 environment. We had some comments.

12 If you look through the AMPs, the  
13 definition of "adverse localized" was somewhat  
14 variable between the different AMP versions. We tried  
15 to clarify that to be consistent across. So, it  
16 didn't change the definition. Actually, we just made  
17 it consistent with the AMP definition then throughout  
18 the AMPs. So, that's all that really was.

19 Then another change here was is the way  
20 the AMP was originally written up, they called it a  
21 sampling technique. In reality, the sampling was you  
22 have inaccessible cable and accessible cable. This  
23 AMP was designed to look at the accessible cable to  
24 make a determination that the inaccessible cable are  
25 okay. That's the sample. So, the inaccessible and

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 accessible are essentially the sampling.

2 So, removed the sampling criteria  
3 technique and all that and said you will just look at  
4 all the inaccessible cable within that - whatever  
5 environment you found, and you'll make the  
6 determination based on that. So, that was the major  
7 change there.

8 There were some definitions and  
9 terminology essentially just to make it consistent  
10 across all AMPs - across electrical AMPs.

11 Let's see. Anything else?

12 And there was one thing I noticed  
13 throughout the AMPs, too, the format was changed. We  
14 just changed some paragraphs and just editorially.  
15 And that's pretty much it for E1.

16 Are there questions?

17 MEMBER STETKAR: Did you get much push-back  
18 from the industry on expanding the scope on this?

19 MR. DOUTT: In general, most applicants  
20 were already looking at all - so, it wasn't a major -  
21 it wasn't a major change in most cases.

22 MEMBER STETKAR: Okay. Thank you.

23 MR. DOUTT: That's my understanding of it.

24 And where are we now? Two. Two didn't  
25 have - basically, program description was

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 consolidated.

2 MR. GRAMM: Excuse me.

3 (Off-record comments.)

4 MR. DOUTT: Sorry about that.

5 MR. GRAMM: Thanks.

6 MR. DOUTT: The program description on this  
7 one was consolidated. Essentially just, again,  
8 adverse localized environment was updated to be  
9 consistent.

10 The only thing that happened in this AMP  
11 was just definitions and terminology was just changed  
12 to be consistent throughout the AMPs. There was no  
13 major change to the AMP as far as what's covered.

14 For metal enclosed bus, the program  
15 description and scope of program were revised. this  
16 was essentially to get rid of or to try to eliminate  
17 some exceptions.

18 Normally what an applicant would like to  
19 do is put in the external/internal inspections in the  
20 electrical AMP. So, we used - we tended to get  
21 exceptions to allow that to happen which we would  
22 review and approve.

23 So, the changes here were to add that  
24 inspection criteria in the E4 so you now have the  
25 option you can either go to the structural monitoring

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 of the elastomers and do it separately, or do it  
2 within the AMP itself.

3 And we got comments from a work point of  
4 view that we're already thinking electrical is doing  
5 this, internals, we might as well do the externals at  
6 the same time. Can we work the AMP such that that  
7 would be possible? So, that's what that change did.

8 The parameters monitored/inspected  
9 changing effects, again this was just consistency  
10 between the AMPs just like the others and with the  
11 GALL Chapter VI.

12 There was a change here to revise the line  
13 items just from a material point of view. There  
14 wasn't a major change in what we were looking at. It  
15 just - we added in different environmental, different  
16 conditions. So, there is a change in that regard.

17 We also updated the sampling criterion for  
18 this for the - for looking at both the connections.  
19 We just - again, it depends on installation, but  
20 basically we gave a criteria of 20 percent or 25 based  
21 on the type of connection. They would still have to  
22 define what that population would be.

23 And again, yes, definitions/terminology  
24 was changed, but nothing major.

25 E5, fuse holders, no major changes to fuse

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 holders except we did revise the operating experience  
2 to add in a NUREG. The NUREG actually talks about  
3 fuses, not necessarily fuse holders, but it has some  
4 information in it and it's worth - so, we thought it  
5 was worthwhile to add it.

6 The aging effect and mechanism are  
7 consistent with the AMP. We changed those just,  
8 again, just across all the electrical.

9 And the parameter monitored/inspected,  
10 that was just materials in basically what you're  
11 looking for in aging effects from a visual inspection  
12 or if you're doing a thermal inspection. That was  
13 just revised to be consistent across the GALL and  
14 across the AMP, but there was no major change in scope  
15 or anything like that.

16 And the last one, E6, which is Electrical  
17 Cable Connections Not Subject to 50.49, the major  
18 change here was just to incorporate the ISG which  
19 provides now for onetime testing which is a relaxation  
20 from what it was before.

21 And, again, to do the onetime testing,  
22 there is some discussion of sampling criteria which is  
23 also new.

24 We also clarified, again, definitions and  
25 some discussion of what, again, if you're doing a

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 visual inspection, what criteria you're looking for,  
2 what aspects of aging - what aging mechanisms effects  
3 would you look for.

4           There is a change, too, with the onetime -  
5 if you do have - do visual inspection, that would be  
6 on a five-year basis. So, it wouldn't be a onetime.

7           It also - it's one time based on plant  
8 operating experience. Industry and the NRC agreed  
9 that connection failure is a relatively rare event and  
10 one time would be adequate. But, again, on plant-  
11 specific situations, you would review to make sure  
12 that, in fact, that that's bounding for that plant.

13           That's it for change. Any questions?

14           CHAIRMAN BONACA: Just a question I have  
15 regarding Page 13.

16           MR. DOUTT: Page 13.

17           CHAIRMAN BONACA: Detection of aging  
18 effects. Clearly, they have expanded the scope of  
19 license renewal going down to 400 volts.

20           MR. DOUTT: Right.

21           CHAIRMAN BONACA: And you have increased  
22 the frequency of inspection. So, the focus is very  
23 much on frequency of inspection.

24           What about testing?

25           MR. DOUTT: That's also changed.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 Inspection went to one year. Testing was increased.

2 CHAIRMAN BONACA: Have to understand the  
3 relationship between, you know, you do every year for  
4 six months an inspection, you find whatever you find -

5 MR. DOUTT: What would happen -

6 CHAIRMAN BONACA: - every six years.

7 MR. DOUTT: Right.

8 CHAIRMAN BONACA: Or longer than that.

9 What's the logic?

10 Maybe it's in 1950, but -

11 MR. DOUTT: The logic for the one year was  
12 essentially based on operating experience and what we  
13 had seen. And there have been comments from, you  
14 know, our inspections, our audits, actually ACRS  
15 comments, concerning the two-year time frame and  
16 whether that was - that period was too long.

17 So, we looked at that and in some cases we  
18 found if you were on a two-year and found flooding,  
19 reduce it to a year, you could be a significant period  
20 of time before you went back to that cable and it  
21 would be submerged for a significant period of time.

22 So, we did two things. We changed it to  
23 one year, and we added event driven to try and cover  
24 anything that wasn't groundwater or some type of  
25 periodic-type inspection if you had some flooding or

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 anything like that, to try to catch that to minimize  
2 the exposure to significant moisture. So, that's why  
3 we changed the inspection time frame.

4 The testing time frame was changed just to  
5 try to cover the generic letter failure - I'll say  
6 "population," but it was backed up just to cover the -  
7 what we've seen - what we've seen is within the six to  
8 ten-year time frame, failures are beginning. So , we  
9 just backed it up to do that. It seemed to be the  
10 appropriate thing to do.

11 And, really, that input came from Division  
12 of Engineering and research work as well. That's  
13 where that came from.

14 CHAIRMAN BONACA: All right.

15 MR. DOUTT: And, again, that time frame for  
16 six years is based also on operating experience and  
17 plant-specific - and so is the one year. The one year  
18 could be affected by, you know, specific manholes,  
19 specific cable conditions. That's essentially a  
20 backstop.

21 CHAIRMAN BONACA: Thank you.

22 MR. GRAMM: Okay. We are now going to  
23 shift and talk about the structural topics. I'll be  
24 joined by Hans Ashar from Division of License Renewal  
25 and he will present the structural changes.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MR. ASHAR: In general, we had one generic  
2 change regarding the structural high-strength bolting  
3 - in the structural bolting in general.

4 What we did was we took all the portion of  
5 the structuralized bolting from the Bolting Integrity  
6 Program that was in the earlier version and put it  
7 into the various structural AMPs.

8 These structural AMPs affected S1, S3, S6  
9 and S7. These four AMPs are affected by this change.

10 So, we have to incorporate each of those changes.

11 In S1 in addition to the structural  
12 bolting portion, we included parameters monitored and  
13 trending, corrective actions revised AMP to  
14 incorporate interim staff guidance LR-2006-01 related  
15 to monitoring of MK1 drywell corrosion.

16 This one, we are evaluating it by this  
17 particular ISG, but now we incorporated that ISG into  
18 the programs.

19 Detection of aging effects revised to  
20 augment IWE requirement to include surface examination  
21 to detect cracking in SS penetration sleeves,  
22 dissimilar metal welds consistent with AMR line item  
23 in 2005 GALL report.

24 So, actually what we did was we took out  
25 something that was to be evaluated in AMR line item

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 into the AMP. So, in AMR line item we say that no  
2 further evaluation needed because they are going to  
3 address that particular part as part of AMP.

4 And the advantage of having it in the AMP  
5 is that when everything goes to the site, if it's in  
6 the AMP, they review it quite closely compared to in  
7 AMR line items.

8 So, it is an advantage. So, we made the  
9 transfer for a number of items. Not just one item,  
10 but a number of other items.

11 Associated AMR line items, new line added  
12 as a result of operating experience for torus shell  
13 exposed to air-indoor uncontrolled or treated water  
14 and loss of material due to corrosion.

15 MEMBER ARMIJO: What kind of cracking are  
16 you looking for in these sleeves?

17 MR. ASHAR: In the sleeves?

18 MEMBER ARMIJO: Yes, they kind of operate  
19 at low temperature, pretty mild environment compared  
20 to -

21 MR. ASHAR: Yes, it is a milder  
22 environment, but the whole thing is that this  
23 examination for cracking in SS penetration was there  
24 always in ASME 1992 edition and 1995 edition. But in  
25 Regulation 10 CFR 50.55, we made it optional.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 I don't know why we did that or whatever  
2 we did, but then in Division of License Renewal  
3 framework we introduce that as a part of aging  
4 management program that they are to look at it.

5 Now, if they do have a dissimilar matter  
6 in the stainless steel penetration, we don't have any  
7 experience of any kind of a problem with those  
8 components. But because it is we are extending from  
9 40 to 60, we wanted to have it in as a part of aging  
10 management program.

11 MEMBER ARMIJO: And also for consistency  
12 with the code, is that your main reason?

13 MR. ASHAR: Well, what happen after 1992  
14 edition and `95 edition, the ASME in 1998 edition and  
15 later, they took out that provision. Because we made  
16 it optional, so they took out that provision.

17 MEMBER ARMIJO: Well, you know, the reason  
18 I'm asking it is this based on operational experience  
19 that indicates there's a problem or not because it's a  
20 pretty mild environment for these kinds of steels and  
21 I just wonder why you put it back in if, you know, if  
22 you're inspecting a torus in any case, it's probably  
23 just as easy to look at that as well.

24 But I just can't - I just wanted to know  
25 whether you're worried about a fatigue cracking or

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 maybe something like chloride stress corrosion  
2 cracking or something that is of concern at low  
3 temperatures. Because otherwise, these steels  
4 shouldn't really be affected at all by that.

5 MR. ASHAR: Well, only operating experience  
6 we have is regarding the cracking of bellows which are  
7 inside the penetrations. Okay. And that happen  
8 because of a certain chloride contamination.

9 MEMBER ARMIJO: Yes. So, it's a  
10 contamination related -

11 MR. ASHAR: It can happen in some plants,  
12 and we wanted to make sure there is cover if it has  
13 happened. Otherwise, they can just so know - they can  
14 say in the AMR line items, no harm.

15 MEMBER ARMIJO: Okay. Thank you.

16 MR. ASHAR: The next one is IWL, which is  
17 a concrete surface examination and a system  
18 examination.

19 Parameters monitored revised to include  
20 additional monitoring of tendons when containment  
21 cutout is needed to facilitate replacement of steam  
22 generator or reactor vessel head, which has happened a  
23 number of times so far.

24 And what happened was in - we have some  
25 provisional requirements - I will say recommendation

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 rather than requirement, in one of the safety  
2 evaluation report we wrote.

3 But in 2004 edition of the code, this  
4 became a requirement because they provided the table  
5 as to how many special tendons had to be de-tensioned  
6 and how to go about doing the cutout portion.

7 So, there is much - very well described in  
8 2004 edition of the ASME code. So, we just  
9 incorporated that portion into the - so, there is a  
10 change.

11 And for S3, S3 is component supports.  
12 Parameters monitored in that one address the supports,  
13 sliding support, spring - sliding supports, spring and  
14 constant load supports.

15 We're always being asked - it was always  
16 in AMR line items. We did not put them into AMP  
17 earlier. So, now we have it in the AMPs, and  
18 structural bolting.

19 Now, we had asked a number of questions on  
20 sliding surfaces, for example, because people are  
21 using Lubrite and other kind of surfaces. Only thing  
22 they can do, they can look at the function from the  
23 point of view that they can go and see if there's any  
24 dirt or something that might hinder the actual sliding  
25 of the particular connection.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1           Detection of aging effects clarified to  
2 include aging effects for structural bolting, sliding  
3 surfaces, elastometric vibration isolator and - yes,  
4 this we are always reviewing, but it was not - it was  
5 not in the AMP before.

6           Appendix J in detection of aging effects,  
7 we emphasized the particular concept that hey, the  
8 integrity of containment is maintained by two things.

9           One thing is an insulation inspection requirement,  
10 which are in the IWL, and the performance monitoring  
11 by leak rate testing.

12           So, they worked in combination to maintain  
13 the containment integrity. So, that's why we just  
14 clarified that portion.

15           Updated the references to NEI 94-01 Rev 2-  
16 A. Now, NEI 94-01 I should explain a little. It is a  
17 position the staff took when the industry came and  
18 said that hey, all the risk assessment that we have  
19 done shows that we can increase the interval for  
20 integrated leak rate testing from ten years to 15  
21 years. And they provided a lot of data on the  
22 particular items. And NEI 94-01 incorporated what  
23 they should do in order to use that particular  
24 provision and we wrote this safety evaluation report  
25 with number of exceptions in it and said that yes, it

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 is acceptable provided this, this, this, this.

2 Associated - revised to separate those  
3 components where AMP XI.S4 by itself is applicable  
4 like the seals and gaskets. They are being always by  
5 performance monitoring. That when you pump up the -  
6 either the penetration or isolation wall for the whole  
7 containment in Type A testing, then it will be sealing  
8 some gaskets which will be tested that they are not  
9 leaking.

10 On masonry walls, we clarified fire  
11 barrier masonry walls covered by Fire Protection. As  
12 a matter of fact, most applicants that I have reviewed  
13 recently, they always have both the programs working  
14 for masonry walls.

15 There are different people who might be  
16 working on this particular item, but they always have  
17 to be correlated. There are some walls which may not  
18 be fire-resistance-related, and then we just partition  
19 wall or the barrier or something. In that case, they  
20 look for the same thing. Cracking or - cracking or  
21 deterioration of the masonry wall or the joints.

22 Clarified parameters monitored for  
23 cracking, separation or shrinkage. Associated AMR  
24 line items, added new AMR lines for masonry walls  
25 exposed to air-outdoors.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MEMBER STETKAR: Hans?

2 MR. ASHAR: Yes.

3 MEMBER STETKAR: The masonry walls  
4 inspection program basically establishes a five-year  
5 inspection interval.

6 MR. ASHAR: That is correct. Not to exceed  
7 five years.

8 MEMBER STETKAR: Not to exceed five years?

9 MR. ASHAR: Right.

10 MEMBER STETKAR: Do licensees typically  
11 categorize a particular wall as either inspected under  
12 this program or under the fire protection program, but  
13 not both, or do they inspect them under both programs?

14 MR. ASHAR: Well, for the in-scope masonry  
15 walls, the applicants can separately examine it under  
16 two programs, the fire protection program and the  
17 structural monitoring program.

18 MEMBER STETKAR: Okay.

19 MR. ASHAR: Or S5 program. But what I was  
20 seeing in the applications, is that whenever there is  
21 a common thing that that particular wall is in scope  
22 as well as it is a fire protection barrier, in that  
23 case, that is being examined by fire protection  
24 program.

25 MEMBER STETKAR: I guess the source of my

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 question is under the fire protection program, the  
2 inspection requirements say to examine not less than  
3 ten percent of each type of fire barrier at a  
4 frequency that's consistent with the plant's plant-  
5 specific fire protection program.

6 Now, I don't know what those inspection  
7 frequencies are. Used to be specified once a  
8 refueling outage. So, let's say it's ten percent once  
9 every - I'll use a couple-of-years sort of frequency.

10 So, a particular masonry wall that's  
11 inspected as a fire barrier might not be inspected  
12 very often at all, because I only need to sample ten  
13 percent of those, and inspect that ten percent once  
14 every couple of - I don't want to say two, because  
15 it's a variability.

16 Are those masonry walls still going to be  
17 inspected once every five years under this program?

18 MR. ASHAR: That is the way we have written  
19 and that is the way -

20 MEMBER STETKAR: Okay. I just wanted to  
21 make sure there wasn't some walls that would slip  
22 through a crack because somebody was -

23 MR. ASHAR: It's not the ten percent, 20  
24 percent -

25 MEMBER STETKAR: - characterizing them as

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 a fire barrier.

2 MR. ASHAR: In masonry wall, we have not  
3 partitioned them into ten percent, 20 percent or  
4 anything like that.

5 MEMBER STETKAR: Okay. Okay. So,  
6 regardless of -

7 MR. ASHAR: Regardless of -

8 MEMBER STETKAR: They'll be done every five  
9 years. Thank you.

10 MR. ASHAR: Structures monitoring, scope of  
11 program revised to clarify when the applicant has the  
12 option to include masonry walls and water control  
13 structures within the scope of the program.

14 Now, what is happening here is that there  
15 are two programs which could be addressed into S6 like  
16 the masonry wall program and the water control  
17 structures program.

18 Now, the applicants have elected to  
19 include them because it might be a part of the way  
20 they would inspect certain things and it will be  
21 easier for them to group them out and have the crew or  
22 the qualified people going around for both the things  
23 together.

24 So, it might help them out. So, we  
25 allowed them to do that. And so far, all the elements

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 of the S5 and S7 program are incorporated into S6  
2 program.

3 So, we allow them to do that. As a matter  
4 of fact, the last application I looked at, they had  
5 the S5 program, S7 program, and still they said that  
6 they would be incorporating those into S6 program.  
7 They are just separately or just both of them. So,  
8 there's more than enough for us to review there.

9 Revised to clarify parameters to be  
10 monitored for concrete, steel, structural bolting,  
11 structural sealants, elastomeric vibration isolators,  
12 groundwater chemistry and settlement monitoring.

13 Another one in detection of aging effects,  
14 in-scope structures stipulated in the ACI-349-3R.  
15 Now, this is the document which talks about acceptance  
16 criteria for concrete structures. And it also  
17 provides operational frequency at which you should  
18 examine the structure.

19 And it is generally five years, but there  
20 are certain structures with a benign environment that  
21 can go as much as ten years.

22 For example, inaccessibility of the  
23 concrete structures like below the grade areas. They  
24 can go up to ten years. But if there's an  
25 opportunistic inspection in between, then they will do

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 that too as a part of the program.

2 Settlement monitoring is a plant-specific  
3 parameter which based on their experience the tank is  
4 settling after 30 to 40 years of operation. And then  
5 they decide whether they are to continue.

6 As far as we know, there's not a single  
7 plant that we know which had the settlement monitoring  
8 program in effect because what is going to happen, had  
9 happened in ten to 20 years and it was being recorded.

10 Groundwater chemistry not to exceed five  
11 years.

12 Water-control structures inspection claim  
13 that dam inspection is not in scope. Now, the dam  
14 inspection is generally being covered by Federal  
15 Energy Regulatory Commission and the Corps of  
16 Engineers. They are the two agencies which takes care  
17 of the dam whether power plant related or non-power  
18 plant.

19 The scope of program clarified to include  
20 sluice gates and trash racks. This article we had  
21 earlier in the line items, but now we put it into the  
22 - into the AMPs.

23 Associated line items, added new line for  
24 wooden sheet piles in air-outdoor or water flowing or  
25 standing or groundwater or soil. So, this one we

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 added because we found that some people are using  
2 wooden sheet piling.

3 S8 is Protective Coating Monitoring and  
4 Maintenance program. In this one, we updated the ASTM  
5 standards which are relevant to the coating. There  
6 are new standards for acceptance.

7 Clarified importance of coating assessment  
8 for ECCS performance.

9 Scope of program clarified to include  
10 coating on concrete so that the coating in  
11 containments are completely addressed. Steel, as well  
12 as the concrete area. If there's any kind of abrasion  
13 or defect or something that might jeopardize the ECCS  
14 functioning, then they are covered, examined for  
15 corrective actions.

16 MEMBER ARMIJO: Does that include the  
17 coatings on the metal liners?

18 MR. ASHAR: Yes.

19 MEMBER ARMIJO: Okay.

20 MR. ASHAR: Only thing we added is the  
21 concrete now. We didn't have the concrete before.

22 MEMBER ARMIJO: Okay. You always had the  
23 liners.

24 MR. ASHAR: Liner we always had, yes.

25 Revised reference to RG 1.54, Rev 2. Rev

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 2 is a very recently issued revision of 1.54. As a  
2 matter of fact, Bob will have to do some juggling to  
3 get it in, in the new program now.

4 New ARM line item added in Chapters II and  
5 III for loss of coating integrity due to blistering,  
6 cracking, flaking, etcetera.

7 This concludes my presentation.

8 MR. GRAMM: Thank you, Hans.

9 We're a little bit ahead of schedule. We  
10 can proceed with mechanical topics or take a break at  
11 your discretion.

12 CHAIRMAN BONACA: Well, we have this  
13 mission that is going to come and see us at some  
14 point. Probably we should stay on schedule that we  
15 have submitted.

16 Could we go for 15 minutes and then take a  
17 break at 10:00?

18 MR. GRAMM: Let's do that.

19 CHAIRMAN BONACA: Actually, I have a  
20 question I would like to ask now. This was regarding  
21 Slide Number 10.

22 You were pointing out there that one thing  
23 you have done is to have a combination of, for  
24 example, in this case, an example of water chemistry  
25 and onetime inspection program. And this - if you

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 have both of them this way as you prescribed, there is  
2 no need for an enhancement of the problem itself.  
3 Okay.

4 The question I have is, is this  
5 prescriptive this way or can the licensee still go  
6 with a combination of water chemistry and something  
7 else?

8 MR. PATEL: The applicant has to do a  
9 verification of the effectiveness of water chemistry.

10 So, they have to do some kind of an inspection. Some  
11 kind of sampling inspection.

12 CHAIRMAN BONACA: I understand.

13 MR. PATEL: The application that you had up  
14 to now have usually used the onetime inspection  
15 program as identified in the GALL report.

16 They could use their own plant-specific  
17 program, in which case they may have to provide  
18 information on the application that we're going to use  
19 water chemistry, and here's the program we're going to  
20 use to inspect for effectiveness of the water  
21 chemistry program.

22 CHAIRMAN BONACA: But before you offered  
23 them to have an enhancement, and now you are  
24 prescribing what the enhancement should be, and you  
25 really don't have a default program that is to be

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 provided to the licensee.

2 I mean, how would you handle that?

3 Assume the licensee proposed something  
4 different from this as an enhancement.

5 MR. PATEL: Enhancement to the water  
6 chemistry program?

7 CHAIR BONACA: No.

8 MR. MEDOFF: Erach, may I chime in here?

9 This is Jim Medoff of the staff. Let me  
10 chime in here.

11 The - as Erach said, there are certain AMR  
12 examples in the GALL report where a couple of, you  
13 know, water chemistry is the primary program. They  
14 use a preventative or a mitigative program like water  
15 chemistry to manage the aging effect and they couple  
16 it to an inspection. Mostly - usually the applicants  
17 use onetime inspection to verify the effectiveness of  
18 the water chemistry program. There are a couple of  
19 others like fuel oil chemistry where they may have  
20 similar combinations.

21 So, it's typically where they're using an  
22 inspection program for verification of a preventative  
23 program where it relies on chemistry monitoring for  
24 management of the aging effect, and that's the primary  
25 program.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1           In the old GALL report, we coupled that  
2 with a further evaluation item. When we - over the  
3 years when we review the applications, they would come  
4 in very consistent with those recommendations. So,  
5 there was no reason to treat this as a further  
6 evaluation. I mean, there's nothing special about it  
7 anymore.

8           CHAIRMAN BONACA: So, let me ask it this  
9 way: During the workshops, do you find that the  
10 licensees typically support this approach which you  
11 have proposed?

12           MR. MEDOFF: Say that again one more time.

13           CHAIRMAN BONACA: Did you find that the  
14 licensees support the approach you propose here?

15           MR. MEDOFF: Yes.

16           CHAIRMAN BONACA: Which is the one on the  
17 prescribed enhancement and -

18           MR. MEDOFF: Right. So, we didn't - there  
19 was no need to treat it like - every time there's a  
20 further evaluation, they have to add a tech section to  
21 the LRA and discuss how they address that further  
22 evaluation recommendation.

23           So, there was nothing special about it  
24 anymore. So, we removed it from the recommendation.

25           CHAIRMAN BONACA: All right.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MR. DOZIER: And this was primarily what  
2 they were doing all along, you know. We had an aging  
3 management review line item that had, you know,  
4 chemistry and onetime inspection with further  
5 evaluation.

6 We enhanced both the chemistry procedure -  
7 the chemistry AMP and the onetime inspection AMP where  
8 now they could do this, be consistent with GALL, and  
9 so it made it easier for the applicant. As far as  
10 what is actually being performed, there's really no  
11 change.

12 MR. MEDOFF: And let me make one other  
13 clarification for you asked could they do something  
14 different for the verification of the preventative  
15 program. And the answer is yes, but there's an NEI  
16 format in the AMR line item that they follow for that.

17 It comes under Footnote E.

18 So, in my line item if I'm going to use a  
19 different inspection program for preventative program  
20 verification, they should put a footnote in their line  
21 item under that case. And Julie Keys is nodding her  
22 head yes. So, that's the way we handled it.

23 CHAIRMAN BONACA: Okay. All right. Thank  
24 you.

25 MEMBER STETKAR: As long as you brought it

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 up and since we're ahead of the -

2 CHAIRMAN BONACA: Sure.

3 MEMBER STETKAR: - schedule, I had the  
4 question on the onetime inspection, but I've seen it a  
5 couple of places in this revision of the GALL report.

6 The onetime inspection program specifies a  
7 sample size of 20 percent of the population, the  
8 susceptible population, or a maximum of 25 components.

9 And I was curious what the basis for the maximum of  
10 25 as just a simple scale or quantity regardless of  
11 what the population of potentially vulnerable  
12 components, what's the basis for that maximum of 25?

13 If I've got 10,000 components, the  
14 difference between 2,000 and 25 is a rather large  
15 difference.

16 MR. GRAMM: Dave Alley from the staff is  
17 going to comment on that.

18 MEMBER STETKAR: I just did a quick word  
19 search. That same qualification didn't seem to exist  
20 in Rev 1 of the GALL. I might have missed it, but  
21 this seems to be a kind of fundamental change in the  
22 concept of sampling.

23 MR. ALLEY: This is Dave Alley from the  
24 staff. It is a bit of a change from Rev 1. The  
25 rationale for the maximum number of components is

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 based on the statistical analysis of 90/90.

2 And when we do that, we find that there -

3 MEMBER STETKAR: Now, wait a minute.

4 Doesn't that depend on the size of the population?

5 MR. ALLEY: It does, but it maximizes out  
6 at around 25 to 27 samples for essentially an infinite  
7 population.

8 The sample is a curve at that point so  
9 that when you have a very small sample size, the  
10 number of samples has to be relatively close to the  
11 full population size.

12 As you increase the full population size,  
13 the size of the sample in order to achieve 90/90 gets  
14 much, much, much smaller than the population size.

15 MEMBER STETKAR: Right. No, I understand  
16 that. I was just curious why 25 was a one size fits  
17 all regardless of -

18 MR. ALLEY: That's about -

19 MEMBER STETKAR: - any population.

20 MR. ALLEY: Right. That's about where the  
21 plateau begins on the 90/90 sample criteria.

22 MEMBER STETKAR: Okay. Thank you.

23 CHAIRMAN BONACA: Okay. Well, I think that  
24 we should take a break now. It's already five of  
25 10:00. No point in interrupting.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1           Let's take a break and we can start again  
2 at 20 after.

3           MEMBER STETKAR: 20 after?

4           CHAIRMAN BONACA: Yes.

5           (Whereupon, the above-entitled matter went  
6 off the record at 9:55 a.m. and resumed at 10:21 a.m.)

7           CHAIRMAN BONACA: Let's get back into  
8 session. Before we start with the representation, I  
9 would like to make an announcement.

10           We are pleased to be joined today by  
11 members of the IAEA Integrated Regulatory Review  
12 Service, IRRS, mission who are here to conduct a  
13 review of the NRC. And you already - some of you have  
14 met because they were present on the floor for the  
15 past half an hour.

16           The team leader of the mission is Dr.  
17 Laaksonen from Finland, representing team leader is  
18 Dr. Soda from Japan, and other members here today  
19 include Dr. Gustavo Caruso from Spain. Welcome and -

20           (Off-record comments.)

21           CHAIRMAN BONACA: We are going to resume  
22 the meeting now and we are at mechanical AMPs.

23           MR. GRAMM: Thank you. And Erach Patel is  
24 going to walk through some general changes we made to  
25 the mechanical AMPs, and then we'll probe in a couple

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 specific more-focused areas following Erach's opening  
2 presentation.

3 MR. PATEL: In the mechanical AMPs, we  
4 added three new AMPs. One of them PWR vessel  
5 internals, which will be covered later as part of the  
6 specific AMP changes. The other one was M40 on  
7 neutron-absorbing materials other than Boraflex. And  
8 this AMP incorporates ISG 2009-01 and includes that as  
9 part of the AMP.

10 And the third AMP that we revised - or  
11 that's a new AMP, is on buried and underground piping  
12 and tanks. And, again, that will be addressed  
13 separately as a specific change.

14 There were two AMPs that were deleted.  
15 These AMPs had not been used at all in any of the  
16 applications. So, due to relevance we deleted these  
17 two AMPs as not being applicable.

18 We eliminated three AMPs because we  
19 subsumed them in some of the existing AMPs. For  
20 example, the AMP on cast austenitic stainless steel  
21 thermal aging and neutron irradiation embrittlement is  
22 now subsumed in the PWR internals for M9, and in the  
23 new PWR vessel internals M16A. So, we didn't need to  
24 have a separate AMP to cover that.

25 The same thing - we had two separate AMPs

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 for buried piping, which we had before. One was  
2 surveillance, and one was for inspection. Those two  
3 AMPs are deleted because now the new AMP that we  
4 created, M41, takes into account everything that we  
5 need to put in the backup.

6 We made changes to various AMPs. One of  
7 the changes we made was to 11B, which is on this  
8 cracking of nickel-alloy components. In the past, we  
9 used to have a licensing commitment that the applicant  
10 was making. 10 CFR 50.55 now has included code cases  
11 722 and 729, and those have now been incorporated into  
12 11B.

13 Closed treated water systems was a change  
14 because we have more closed cycle cooling water stuff  
15 included in there. More than just what we had before.

16 So, it's a change that we made.

17 Reactor vessel surveillance, the AMP in  
18 2005 was not in the ten-element format. So, we revised  
19 M31 to now include that as a ten-element format to put  
20 that in there.

21 Onetime inspection of ASME Code Class 1  
22 small bore piping was changed to include socket welds  
23 and sampling sizes and things like that.

24 MEMBER SHACK: Isn't it sort of a misnomer  
25 now to call it the onetime inspection since depending

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 on plant history it could be periodic?

2 MR. PATEL: I will address that under M32.

3 MEMBER SHACK: Okay.

4 MR. PATEL: In the case of external surface  
5 monitoring of mechanical components and inspection of  
6 internal surfaces, those two AMPs previously only  
7 addressed steel components. These AMPs have now been  
8 revised to include other metals and also elastomers  
9 and PVC and polymers and things like that.

10 So, we included detection of aging effects  
11 and parameters monitored, etcetera, so that this AMP  
12 can now be used for elastomers in mechanical - in  
13 mechanical systems.

14 I don't have the onetime inspection, M32,  
15 but M32 was revised. And we have in M32 under program  
16 description, we added that this program cannot be used  
17 for structures of components with known age-related  
18 degradation mechanism. In this case, periodic  
19 inspection should be performed in this case.

20 If a plant already knows that we have an  
21 existing cracking in small-bore piping, for example,  
22 or in onetime inspection, you cannot use that.

23 So, for example, if you use onetime  
24 inspection for verification of chemistry, but the  
25 plant already knows we do have cracking, then they

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 cannot use this program. They got to go for periodic  
2 inspection.

3 CHAIRMAN BONACA: I mean, onetime  
4 inspection is always - we use the concept for aging  
5 that we don't believe is going to happen. It's just a  
6 confirmation that the aging effect is not taking  
7 place.

8 So, for example, Chapter XI.M35 you're  
9 showing onetime inspection of ASME Code Class 1 small-  
10 bore piping.

11 Why would you call this onetime  
12 inspection?

13 MR. DOZIER: That's a very good question  
14 because, as you said, if they have experienced the  
15 problem, we do require periodic -

16 CHAIRMAN BONACA: Thank you. And, in fact,  
17 I mean, I believe you have now a new program, right?

18 MR. DOZIER: Dr. Hiser.

19 DR. HISER: Hi. Allen Hiser from NRC staff.

20 Yes, if they have had cracking and they -  
21 the onetime inspection is not appropriate for them. I  
22 don't remember if the AMP is specific to one time or  
23 if it's more general, actually, to a periodic program  
24 as well. I think it is specific to one time.

25 MEMBER SHACK: No, it's more general,

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 Allen. If you look at the last paragraph on Page X35  
2 1, M35 1, it points out that if you had experienced  
3 cracking, it's periodic.

4 DR. HISER: We may need to take a look at  
5 the title of that.

6 MEMBER SHACK: That's why I thought there  
7 was sort of a misnomer in the name. I'd just make it  
8 inspection of Class 1 piping.

9 MR. GRAMM: Well, in actuality to clarify,  
10 the AMP is only on a onetime basis. And if that - if  
11 they haven't rectified the situation, they need a  
12 plant-specific periodic program which kicks you  
13 entirely out of M35.

14 MEMBER SHACK: Okay.

15 MEMBER STETKAR: As long as we're -

16 MR. GRAMM: Are you satisfied, Bill?

17 MEMBER SHACK: Yes.

18 MEMBER STETKAR: As long as we're talking  
19 about this, I didn't see M35 in any of your slide  
20 material.

21 MR. DOZIER: We will cover M35.

22 MEMBER STETKAR: You will? Okay.

23 MR. DOZIER: Yes.

24 MEMBER STETKAR: I'll wait until then.

25 MR. DOZIER: It is - you're correct. It's

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 not in your package. However, we have a backup slide  
2 based on -

3 MEMBER STETKAR: As long as you're planning  
4 to cover it, I'll wait until then so you can -

5 MR. DOZIER: Dr. Allen Hiser will be  
6 presenting that.

7 MEMBER STETKAR: Okay. Thank you.

8 MR. GRAMM: Thank you, Erach.

9 I'd like to be joined now by Dave Alley.  
10 And Dave is going to walk through the extensive  
11 changes that were made as part of introducing the new  
12 AMP M41 for buried piping and underground tanks.

13 MR. ALLEY: As we start to discuss buried  
14 and underground piping and tanks, I want to  
15 preliminarily say that we'll talk about some  
16 objectives, some definitions, the philosophy of the  
17 AMP, preventive actions, inspections, and then I will  
18 attempt to summarize the AMP at that point.

19 We'll start with the objective. The  
20 primary purpose of the AMP is to manage the aging of  
21 buried piping and tanks, which is a good thing because  
22 that's the title of the AMP.

23 The primary focus of the AMP is on  
24 external corrosion. There are some issues in the AMP  
25 that may deal with internal corrosion, but the primary

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 focus is external corrosion.

2 There are a few definitions which are  
3 critical to the AMP that we keep straight. The two  
4 most important are of course "buried" and  
5 "underground."

6 Buried piping is that piping which is in  
7 direct contact with soil or concrete. Buried piping  
8 can be cathodically protected.

9 Underground piping is below-grade piping.  
10 It has limited access. It's in contact in general  
11 with air, humidity. Those sorts of things go along  
12 with that. For example, it is piping that occurs in  
13 trenches or vaults. Underground piping cannot be  
14 cathodically protected.

15 MEMBER ARMIJO: Can it be periodically  
16 exposed to water?

17 MR. ALLEY: It can be -

18 MEMBER ARMIJO: Actually liquid water in a  
19 trench?

20 MR. ALLEY: It can be periodically exposed  
21 to humidity, condensation, potentially standing water,  
22 but it's a - primarily we're looking at a wet air  
23 environment.

24 MEMBER ARMIJO: Okay.

25 MR. ALLEY: Some philosophical tenets upon

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 which the AMP are based, the first one is that  
2 preventive actions are the best approach to managing  
3 the aging of buried and underground piping and tanks.

4 Some inspections are still required. More  
5 inspections are of course required if the preventive  
6 actions are not, shall we say, excellent.

7 The second philosophical point is to  
8 concentrate your efforts on high-risk piping. Now,  
9 risk in this case refers to the general industry - or  
10 the general industrial definitions of risk,  
11 probability of failure times the consequences of  
12 failure. It has nothing to do with core damage  
13 frequency as is commonly used at the NRC.

14 So, as we use "risk" here, we're talking  
15 about a qualitative determination of risk.

16 MEMBER STETKAR: You said probability of  
17 failure times the consequences of failure.

18 What's the measure of merit for the  
19 consequence then?

20 MR. ALLEY: In general industrial terms, it  
21 can be any liability that may be incurred. It may be  
22 the cost of damage of the equipment, it may be the  
23 cost of damage of the cleanup, it may be the cost of  
24 the public relations nightmare that could occur, for  
25 example, in an oil spill.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1           It can be - risk - consequences of  
2 failure in the terms of buried piping can include a  
3 wide variety of issues that all, for the industry,  
4 have a cost associated with them. It's not  
5 specifically limited to safety issues as the NRC would  
6 see them.

7           MEMBER STETKAR: Well, I guess I'm trying  
8 to - I'm trying to understand that because if an  
9 applicant is doing some type of risk-informed - and  
10 I'll use the word "risk" in a generic sense right now  
11 - risk-informed sampling process where they're  
12 identifying higher risk items to populate their  
13 samples, I would hope that we're not simply focusing  
14 on what shows up on the evening news as a higher-  
15 ranking criterion than, for example, a leak that might  
16 compromise the cooling water capability for long-term  
17 heat removal.

18           And from what I heard you say, it sounds  
19 like there might be a danger if standard industrial  
20 and public relations factors are strong influences on  
21 determining what are the most significant  
22 consequences.

23           MR. ALLEY: There are potential influences,  
24 but certainly not the only influence, and certainly  
25 not the strongest influences.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 Safety as far as the NRC is concerned, is  
2 and always will be the primary concern, and we're  
3 ensuring that that remains the case.

4 MEMBER STETKAR: Is there any - I didn't  
5 read anything in the guidance in the NUREG that sort  
6 of emphasizes that this concept of - it's noted that  
7 risk is indeed based - susceptibility of corrosion and  
8 - of both piping materials and particular locations at  
9 the site where they might be subject to a more  
10 aggressive environment, were certainly highlighted in  
11 the NUREG as factors in there.

12 MR. ALLEY: Correct.

13 MEMBER STETKAR: But that's sort of the  
14 front end. That's the frequency part of the risk  
15 equation if you -

16 MR. ALLEY: Absolutely. Right.

17 MEMBER STETKAR: The NUREG is basically  
18 silent on - in terms of things to think about versus  
19 the consequences. And I - that's why I was a little,  
20 I guess, taken aback at your answer in terms of what  
21 criteria you would expect people to use.

22 MR. ALLEY: Well, what I tried -

23 MR. HOLIAN: This is Brian Holian, Dave.

24 I think just to add, you know, I think the  
25 industry initiative adds onto risk and maybe we can

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 use some of those.

2 I know we've been close to NEI, you know.

3 They put in the industry initiative on this. They've  
4 commented on this AMP. So, maybe we can, you know,  
5 hit it with that thought that we're not trying to -  
6 the groundwater initiative, I know, is what's in the  
7 back of your mind. That's separately, you know, could  
8 we all be influenced?

9 And including license renewal if the  
10 groundwater initiative, though that's separately being  
11 handled on a separate time frame, comes out with  
12 including all tritiated water into the scope of  
13 license renewal, well -

14 MEMBER STETKAR: And I'm not trying to  
15 downplay that. Certainly, you know, releases of -  
16 unmonitored releases of radioactivity to the  
17 environment is something that we should be concerned  
18 about, but -

19 MR. HOLIAN: And I think Dave, what Dave  
20 Alley is just making sure, he's been at most of these  
21 meetings that wants to make sure you're aware of that  
22 ongoing groundwater issue when he uses risk in that  
23 fashion.

24 But for this discussion, we use it the way  
25 NEI is using it or the way these in-house plants are

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 using it. Hey, we want to go dig up the higher risk -  
2 reactor risk type pipes first especially to make sure.

3 And that's how we're using it here.

4 MEMBER STETKAR: Okay. Thank you.

5 MR. ALLEY: And as we go forward, I think  
6 that we'll be able to allay your fears a little bit in  
7 that we specifically look at code class and safety-  
8 related piping, and we specifically look at the hazmat  
9 piping. And that's where I feel certain that we will  
10 not fall into the trap that you are afraid we're  
11 falling into.

12 MEMBER STETKAR: That's good. That helps a  
13 lot. It's just because this concept of risk will be  
14 used to sort of define what those samples are -

15 MR. ALLEY: Right.

16 MEMBER STETKAR: - we want to make sure  
17 that we're not -

18 MR. ALLEY: We make absolutely certain that  
19 we are looking at both -

20 MEMBER STETKAR: Okay.

21 MR. ALLEY: - safety significant and these  
22 other nontraditional NRC safety issue pipes.

23 MEMBER SIEBER: It may be, though, that  
24 even if you all in this room understand what you're  
25 going to need to look at the words again to - the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 words express what it is that we're talking about as  
2 far as scope is concerned.

3 MEMBER STETKAR: Thank you.

4 MR. ALLEY: The point is noted.

5 Okay. We're at concentrating on the high-  
6 risk pipes, and certainly the higher probability of  
7 corrosion is a place to look at. And as we mentioned,  
8 we're going to look at both traditional safety issue  
9 pipes, the code class, the safety-related pipes, and  
10 we're going to look at what we're calling hazmat pipes  
11 which are those which contain radioactive materials,  
12 diesel fuel, biocides, anything that happens to be  
13 buried and, of course, in scope for license renewal.

14 The third design - or the third  
15 philosophical point is that we want to design our  
16 preventive actions and inspections to prevent the  
17 adverse affects from leakage from each type of piping  
18 that we're considering.

19 So, for code class and safety-related  
20 piping, we're concentrating on ensuring that there is  
21 sufficient water flow through that pipe to accomplish  
22 its safety-related function.

23 For the hazmat piping, we're concentrating  
24 on ensuring that groundwater contamination does not  
25 occur as a result of those leaks.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1           So, we have separate objectives and  
2 separate methods from getting to the - for getting to  
3 those points.

4           The next philosophical point that we took  
5 into consideration as we designed the AMP, was that  
6 excavations can damage pipe. We can whack the pipe  
7 with the backhoe and bad things may happen down the  
8 road because we've now damaged the coating. Even if  
9 we attempt to repair the coating at that point, we may  
10 have problems there.

11           And, therefore, the AMP contains  
12 alternatives to excavation and visual inspection that  
13 can be used whenever possible or whenever it makes  
14 sense to the applicant.

15           These include hydrotests, internal  
16 inspections and monitoring active equipment such as  
17 jockey pumps for fire protection or fire maintenance.

18           MEMBER ARMIJO: What sort of internal  
19 inspections are you talking about in this case?

20           Would you do some volumetric inspection to  
21 get wall thickness information or what?

22           MR. ALLEY: That's of course the first one  
23 that comes to mind. There are intelligent pigs that  
24 are used in pipeline inspections very, very  
25 frequently, very commonly that can do ultrasonic

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 testing of wall thicknesses and identify the precise  
2 location of the pig at any given time.

3 The problem with using those in nuclear  
4 power plants is that in general in the past, they  
5 needed to have pig-launching stations and they haven't  
6 been able to handle short-radius elbows.

7 MEMBER ARMIJO: Yes.

8 MR. ALLEY: Those two problems are in the  
9 process of being resolved. There are now pigs that  
10 can be launched and retrieved with much less access to  
11 the pipe, and there are pigs that will handle  
12 standard-radius elbows.

13 So, if an applicant can demonstrate that  
14 they are capable of measuring wall thicknesses of  
15 pipes through internal inspections, that would  
16 certainly be of interest to us.

17 Okay. We'll switch gears a little bit and  
18 we'll talk about preventive actions that are included  
19 in the AMP. Preventive actions apply to all the  
20 piping, except the fire main piping.

21 Fire main piping is installed in  
22 accordance with NFPA 24. That standard in and of  
23 itself has certain requirements for preventive actions  
24 and we are not in a position where we're going to  
25 impose preventive actions on existing piping that were

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 not in place when it was installed.

2 There are separate recommendations for  
3 preventive actions for buried piping and tanks and for  
4 underground piping and tanks. We spell them out  
5 differently hopefully so that no one will get confused  
6 as to which set of recommendations we're talking  
7 about.

8 The preventive actions are based on the  
9 materials of construction, and they concern the  
10 coatings that are present, the backfill that's used  
11 and the presence or absence of cathodic protection.

12 MEMBER ARMIJO: Dave, before you go too  
13 far, could you tell me what a super austenitic  
14 stainless steel is?

15 MR. ALLEY: Those are six molybdenum  
16 stainless steel such as AL-6XN or - oh, I'm forgetting  
17 one of the other - 625 MO. Depends on the  
18 manufacturer, but they have a little bit higher  
19 chrome, a little bit higher nickel than common 300  
20 series stainless steels, and they generally are high  
21 in molybdenum. They have a very high pitting  
22 resistance or PREN number and are relatively - in the  
23 environments that we are going to be seeing in the  
24 buried world, are relatively inert to that  
25 environment.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 MEMBER ARMIJO: Okay. So, it's about two  
2 to three times the normal molybdenum content of -

3 MR. ALLEY: Yes.

4 MEMBER ARMIJO: - the 316?

5 MR. ALLEY: Yes.

6 MEMBER ARMIJO: And I've never heard of it  
7 before, and is it used?

8 MR. ALLEY: There are a few places where  
9 I've heard it being used, yes, sometimes associated  
10 with saltwater piping.

11 MEMBER SHACK: Also, 6XN is good for nick-  
12 type resistance.

13 MR. ALLEY: That's true as well.

14 MEMBER SHACK: I mean, it's like, you know,  
15 it's 20 chrome, 24 nickel, six moly.

16 MEMBER ARMIJO: Okay. Thank you.

17 MR. ALLEY: When you don't use those kind  
18 of numbers on a daily basis, they tend to escape your  
19 brain.

20 But in any case, super austenitic  
21 stainless steel is a stainless steel, and it's just  
22 significantly more corrosion resistant than the  
23 standard 300 series that we're used to dealing with.

24 So, anyway, what we see on this chart is  
25 that we have materials down the left-hand column, we

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 have coatings in the next column, cathodic protection  
2 in the middle one and backfill quality in the last.

3           There's a bunch of footnotes. Most of  
4 those footnotes are relatively self-explanatory. The  
5 ones that we may need to deal with is Footnote 3 for  
6 stainless steel and cementitious material as far as  
7 the coatings go. That means that whether or not a  
8 coating is recommended depends on the environment that  
9 the material would be placed in.

10           Certainly if you had soils with high  
11 chloride content, you'd want to coat your stainless  
12 steel.

13           Cathodic protection is recommended of  
14 course for steel, copper and aluminum. Those are the  
15 materials that are included in the NACE standard for  
16 external corrosion control, which is basically  
17 cathodic protection standard, and that's why they're  
18 there.

19           Footnote 5 which shows up again for  
20 stainless steel and cementitious materials, has to  
21 again do with the concept that if coatings are not  
22 required, then we don't care as much about the  
23 backfill - or that's Footnote 7. Excuse me.

24           Footnote 5 and 6 address the size of the  
25 aggregate material in the backfill. So, what we're

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 looking for is to make sure that there are no large  
2 rocks when we're dealing with coatings. And we're  
3 looking when we're dealing with polymeric materials,  
4 to ensure that the backfill is very fine so that we  
5 don't have slow mechanic growth in polymeric  
6 materials.

7 We'll shift from preventive actions, which  
8 is a separate category, everybody needs to address  
9 their preventive actions, into inspections, which is  
10 again another separate category.

11 There is some interaction between the two,  
12 but we want to make sure that everybody looks at these  
13 two in their entirety somewhat separate from each  
14 other.

15 Anyway, going into inspections, the  
16 categories considered are buried pipe, underground  
17 pipe, buried tanks and underground tanks. Again, we  
18 wanted to spell out all the conditions for each of  
19 these categories separately so that there would be no  
20 confusion, hopefully, on the part of the user as to  
21 which criteria apply to which situation.

22 These apply to code class or safety-  
23 related material or safety-related components, or  
24 hazmat components. Again, we're drawing the  
25 distinction between traditional safety functions and

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 between groundwater contamination issues.

2 There may be some in-scope piping that  
3 doesn't fall into either of these categories. And at  
4 least initially, that piping is not inspected.  
5 However, there are criteria in the AMP that talk about  
6 adverse findings and the expansion of the scope of  
7 inspection, and then you could wind up expanding the  
8 scope of the inspection to cover all the in-scope  
9 piping.

10 MEMBER ARMIJO: Okay. All in scope.

11 MR. ALLEY: All in-scope piping.

12 We clearly here have a regulatory  
13 definition for what license renewal can and should  
14 look at, and everything that's addressed in this AMP  
15 is in scope for license renewal. We make no attempt  
16 to expand beyond the regulatory basis on which the AMP  
17 was created.

18 MEMBER ARMIJO: Okay.

19 MR. ALLEY: The inspections that are  
20 specified in the tables, and we'll get to those in  
21 just a minute, are designed to accommodate the  
22 possibility that you may have poor preventive actions  
23 initially in years 30 to 40 when you're doing your  
24 first inspections. But they expect that in subsequent  
25 inspections that you'll have good preventive actions,

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 and we'll see how that relates.

2 The next table you probably can't read.  
3 We'll get to a piece of that in just a second, but  
4 this is the inspection table for buried piping. There  
5 are equivalent tables for underground piping, for  
6 buried tanks and for underground tanks. They're not  
7 quite as complex as this, but they exist.

8 Now, if we could move to the next slide,  
9 this shows just the inspections for buried steel  
10 piping. And what we're going to see here is that  
11 we've got materials, we've got preventive actions, we  
12 have inspections. And those inspections are  
13 differentiated between code class and safety-related  
14 material, and hazmat material.

15 And, again, that is to ensure that we're  
16 appropriately addressing the potential for leaks that  
17 could cause groundwater contamination, and leaks which  
18 could cause safety issues.

19 So, we're trying to address both sides of  
20 the picture and ensure that we're doing that in a  
21 reasonable manner that will provide relative assurance  
22 of - or reasonable assurance of maintenance of  
23 intended function.

24 MEMBER STETKAR: The frequency of these  
25 inspections begins -

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MR. ALLEY: Once in ten years.

2 MEMBER STETKAR: Once every ten years  
3 starting within -

4 MR. ALLEY: The ten years prior.

5 MEMBER STETKAR: - ten years prior. Okay.

6 MR. ALLEY: So, there's really three  
7 inspection periods that the AMP is covering for this  
8 license renewal. 30 to 40, 40 to 50, 50 to 60.

9 The preventive actions column has C, D, E  
10 and F, and of course you can't tell anything about  
11 that at this point.

12 C refers to piping that's cathodically  
13 protected and that the availability of the cathodic  
14 protection has been good over time.

15 D refers to cathodic protection, but -

16 MEMBER BROWN: By availability, you mean  
17 ability to assess it being still in place?

18 MR. ALLEY: It's been installed for a  
19 relatively long period of time, and it's been plugged  
20 in, and people have been watching it and know that it  
21 works well.

22 MEMBER BROWN: Okay. That's fine. All  
23 right. Thank you.

24 MEMBER ARMIJO: Do you have kind of a  
25 number that you could assign like 90 percent of the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 time?

2 MR. ALLEY: 90 percent is the number.

3 MEMBER ARMIJO: Okay.

4 MR. ALLEY: Let me go and I will read to  
5 you - I figured that this question might come.

6 C taken directly out of the AMP says,  
7 "External corrosion control is provided in accordance  
8 with NACE SPO169-2007. Each cathodic protection  
9 system was; one, installed at least five years prior  
10 to the period of extended operation and was  
11 operational for 90 percent of the time during that  
12 five-year period, or; two, was operational for 90  
13 percent of the time since the last inspection  
14 conducted under this program.

15 So, we have lots of nice words that don't  
16 translate very well in a presentation, but they are in  
17 fact there. And 90 percent is the sort of magic  
18 number that we're using as far as availability in a  
19 time sequence.

20 We expect - cathodic protection system may  
21 have numerous rectifiers and numerous inspection  
22 points. We expect all of them to be working, but  
23 certain one of those we understand may find a fault at  
24 any given period fo time, and we want to ensure that  
25 adequate time for repair can be made without undue

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 penalty to the applicant.

2 MEMBER BROWN: Does the 90 percent, does it  
3 encompass a fixed - I mean, a monitoring schedule?

4 In other words, do you have something -

5 MR. ALLEY: Yes.

6 MEMBER BROWN: So, somebody is required or  
7 there's an automatic recording or alarms are given and  
8 a time check is done so there's an actual metric of  
9 times?

10 MR. ALLEY: This -

11 MEMBER BROWN: Jack's shaking his head one  
12 way, and you're saying yes.

13 MR. ALLEY: The NACE standard says that you  
14 will look at your rectifiers at least every other  
15 month. And the NACE standard also -

16 MEMBER BROWN: When you say look at them, I  
17 mean, I can go look at a rectifier. Yeah, it's there.  
18 It's a hunk of silicon with wires sticking out of it.

19 MR. ALLEY: Well, it's got a nice little  
20 green light on it that says it's working.

21 MEMBER BROWN: Okay. So, there's a visual  
22 way of knowing that it's actually performing its  
23 function.

24 MR. ALLEY: There's a visual way to know  
25 that electricity is going in and electricity is going

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 out.

2 MEMBER BROWN: That's what I was looking  
3 for.

4 MR. ALLEY: Now, once a year the NACE  
5 standard also requires that you conduct a survey to  
6 ensure that all the pieces of pipe that are being  
7 protected have the appropriate voltage on a minus 850  
8 millivolts in order to - that's for steel, mind you -  
9 in order to ensure that it's being properly protected.

10 Copper and aluminum have different  
11 standards and there are a hundred millivolts  
12 difference between when it's turned on and when it's  
13 turned off.

14 MEMBER BROWN: Okay.

15 MR. ALLEY: So, the concept is that there  
16 are in the NACE standard, but not specifically in the  
17 AMP, requirements to look at the system and to  
18 evaluate its performance. And that's what we're  
19 relying on here.

20 We're trying to stay as close to industry  
21 standards as we can with the AMP.

22 MEMBER BROWN: Is it an operating  
23 monitoring or is there actually an alarm or something  
24 that annunciates if you go inside or outside the bands  
25 of the current that's required to be there?

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MR. ALLEY: There is no requirement in the  
2 standard to have an alarm system. And, therefore, the  
3 AMP does not require one.

4 Now, I'm sure that some plants have more  
5 sophisticated monitoring equipment than others, but  
6 there's no requirement in the AMP to -

7 MEMBER BROWN: My question is related to if  
8 somebody is wandering by and saying oh, the light's on  
9 and he only does it every once a week, then it's kind  
10 of hard to say - come up with a metric of 90 percent.

11 That's -

12 MR. ALLEY: Over the long haul, and we're  
13 talking a ten-year interval here -

14 MEMBER BROWN: Okay.

15 MR. ALLEY: - you can still make your 90  
16 percent.

17 MEMBER BROWN: All right. So, if you miss  
18 it for a week over a - okay. I got it.

19 MR. ALLEY: Let's face it. The corrosion  
20 rate on buried pipe might be 20 mills per year. If  
21 you lose the cathodic protection system for a month,  
22 it's not - the world is not going to end.

23 MEMBER BROWN: I got it. I just wanted to  
24 understand what the metric was that you were using.

25 MR. ALLEY: Yes, the world won't end if you

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 have a short outage.

2 MEMBER BROWN: Okay. Thank you.

3 MR. ALLEY: C is cathodic protection that's  
4 really good. D is cathodic protection with lower  
5 availability. E is no cathodic protection, but good  
6 coatings and backfill. And F is life is not so good.

7 And what we've done is in the code class,  
8 these are individual inspections. Each inspection has  
9 to be a hole that's ten feet long. For the hazmat,  
10 that's percentages of piping.

11 So, we're trying to ensure that we're  
12 looking at the right amount of pipe in each class to  
13 get a good idea of whether there is the potential for  
14 leaks to occur.

15 We do provide alternatives of course to  
16 visual inspections. For fire mains, we flow test  
17 either at one-year intervals or we can monitor the  
18 jockey pump activity. That of course is an  
19 instantaneous readout of the health of the system.

20 For any type of pipe, we permit  
21 hydrostatic testing or internal inspections if you can  
22 demonstrate that your internal inspection technique is  
23 adequate to do what it needs to do.

24 So in summary, the intent is to manage  
25 aging. It is best accomplished through preventive

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 actions. The necessary preventive actions depend on  
2 the material and the environment involved.

3 Look at the high-priority piping. Be  
4 consistent in the way that you manage that with the  
5 industry guidelines.

6 So, we look at the oil and gas pipelines.  
7 They rely a significant amount on NACE SPO169.  
8 Critical component to managing aging.

9 Concentrate on the important piping.  
10 Hazmat piping, code class piping, do both. Neither  
11 one is good in and of itself. The level of inspection  
12 should differ.

13 Inspections are necessary. The level of  
14 inspection depends on the material and the preventive  
15 actions in place. Good preventive actions are  
16 anticipated in the AMP by the second inspection, and  
17 alternates to visual inspections have been provided.

18 I think the last thing that I want to  
19 leave with you is a comment on the importance of  
20 preventive actions, and that was provided by the folks  
21 at Duane Arnold in their presentation before the full  
22 committee a couple of weeks ago.

23 They said we had no problems with buried  
24 pipes where we have cathodic protection. But where we  
25 don't have cathodic protection, we have had problems.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 And that concludes my remarks.

2 MEMBER BROWN: If I could, you made a  
3 comment - I think you made the comment earlier and I  
4 didn't interrupt at that time, that there were some  
5 circumstances of buried piping where - and I'm talking  
6 about the three classes that you can use cathodic in  
7 the steel, copper and aluminum.

8 MR. ALLEY: Right.

9 MEMBER BROWN: The underground piping that  
10 you could not use cathodic protection.

11 Did I misunderstand that statement or -

12 MR. ALLEY: I hope I didn't say that.

13 MEMBER BROWN: That's the way I read the  
14 statement that there was some underground piping that  
15 could not be cathodically protected.

16 If it was a materials issue, I was just  
17 trying to -

18 MR. ALLEY: It's not a materials issue.  
19 Steel piping can always be cathodically protected as -  
20 when it's in soil, can be protected.

21 Now, there are certain problems in nuclear  
22 power plants, in oil refineries, in pumping stations  
23 where you have an interwoven network of piping where  
24 it can become more difficult to protect the piping  
25 because you may have stray currents or currents

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 running between one pipe and another.

2 Unless that system is fully designed for  
3 cathodic protection, you can have certain  
4 difficulties.

5 You can also have certain difficulties in  
6 measuring the effectiveness of the cathodic protection  
7 because the pipes talk to each other. And so when you  
8 make the measurement of what the pipe is protected at,  
9 what its voltage is, you may or may not be under - you  
10 may or may not know what the particular pipe that  
11 you're looking at is, because it may be influenced by  
12 the pipe next door.

13 So, there are certain limitations in  
14 nuclear power plants for cathodic protection. Most of  
15 them are related to the measurement of the  
16 effectiveness, but all it means is that you have to be  
17 careful as you implement a cathodic protection system  
18 or as you monitor a cathodic protection system and  
19 that you have the appropriately trained people doing  
20 it.

21 MEMBER BROWN: So, proximity matters.

22 MR. ALLEY: Proximity matters a lot.

23 MEMBER BROWN: I can imagine that.

24 Are there any rules for putting these  
25 systems in initially that they don't have proximity so

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 that you can actually get the protection you want?

2 MR. ALLEY: If you start getting into a  
3 close proximity scenario, you have to be careful how  
4 you interconnect those pipes and how you ground them.

5 MEMBER BROWN: Okay.

6 MEMBER ARMIJO: Those are the NACE  
7 standards, the National Corrosion Engineer Guides.

8 MEMBER BROWN: On ships, we didn't worry.  
9 I mean, you just hooked them on there. That's why I'm  
10 asking questions.

11 MR. ALLEY: It's a little bit more  
12 complicated with buried pipes. And if you have a  
13 light rail system, electric trains running next door,  
14 it gets a little complicated.

15 MEMBER BROWN: You drive ships in  
16 saltwater.

17 MEMBER ARMIJO: You had a good electrolyte,  
18 Charlie.

19 MR. ALLEY: Yes, there are certain issues  
20 and the interconnection and grounding of piping below  
21 grade and above grade starts to interact.

22 MEMBER BROWN: All right.

23 MR. ALLEY: But if there are additional  
24 questions, I think maybe we can handle them later.

25 MEMBER BROWN: That's fine.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MEMBER SIEBER: Have you ever seen any  
2 interaction between the station's grounding mat and  
3 buried piping?

4 MR. ALLEY: Absolutely. That is one of the  
5 issues that is of interest as you attempt to either  
6 install or to monitor your cathodic protection system.

7 In some places, they isolate between above-ground  
8 piping and below-ground piping, and you have to make  
9 sure that those isolations are good as well.

10 MEMBER SIEBER: You can get five to ten  
11 bolts differential between the grounding mat and  
12 building steel or grounded machinery which is - really  
13 gives you a lot of corrosion.

14 MR. ALLEY: Absolutely. There are reasons  
15 that you want to have knowledgeable professionals  
16 doing this kind of work.

17 MEMBER SIEBER: Well, I've experienced some  
18 of those kinds of problems.

19 (Laughter.)

20 MR. ALLEY: Yes, I have no doubt.

21 MEMBER STETKAR: Dave, I had a question.  
22 The table for C, the buried tanks table -

23 MR. ALLEY: Yes.

24 MEMBER STETKAR: - basically tells me that  
25 for - and I'll stick to the steel, copper and aluminum

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 - that I only inspect those tanks if I have  
2 essentially no protection whatsoever.

3 In other words as I read that table, it  
4 has - it has the C, D and E classifications  
5 particularly focused on cathodic protection, and C -  
6 similar definitions to what you -

7 MR. ALLEY: Right. Correct.

8 MEMBER STETKAR: - told us for the buried  
9 piping. But where the X appears in that table, is  
10 only under the condition where I have no cathodic  
11 protection regardless of whether it was reliable or -

12 MR. ALLEY: Correct.

13 MEMBER STETKAR: - installed or anything.

14 MR. ALLEY: Correct.

15 MEMBER STETKAR: Is there a fundamental  
16 basis for that difference?

17 In the steel piping, you have this sort of  
18 graded inspection program based on the quality of your  
19 prevention. And on the tanks, it basically says the  
20 only time I need to inspect them is if I have no  
21 protection whatsoever.

22 MR. ALLEY: Correct. And that was  
23 intentional.

24 One of the thought processes that went  
25 into that was that many of the tanks have an AMP that

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 applies to the inside of the tank. The fuel oil tanks  
2 are addressed - the inside of the fuel oil tanks are  
3 addressed by the fuel oil AMP. And one of the  
4 requirements of that AMP is a periodic inspection of  
5 the tank from the inside to ensure that you haven't  
6 lost too much wall thickness.

7 So, to some extent, it's not explicitly  
8 stated here, but to some extent we're relying on other  
9 AMPs -

10 MEMBER STETKAR: Thanks.

11 MR. ALLEY: - to help us -

12 MEMBER STETKAR: I didn't appreciate that  
13 because, you know, contrary to what I might say here,  
14 I did not read all the AMPs. So, I didn't try to  
15 think about how the different tank AMPs were talking  
16 to one another.

17 MR. ALLEY: Yes.

18 MEMBER STETKAR: Thanks.

19 MR. ALLEY: They do talk to each other and  
20 we are relying to some extent -

21 MEMBER STETKAR: Thanks.

22 MR. ALLEY: - on that.

23 CHAIRMAN BONACA: Okay. Thank you. That  
24 was very informative.

25 MR. GRAMM: Barry Elliot from the staff is

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 going to come up now to talk about a new aging  
2 management program for PWR internals. This program  
3 was based on industry efforts, particularly EPRI, with  
4 the material reliabilities program. And Barry is  
5 going to talk about how that fed into the aging  
6 management program that you saw in the GALL report.

7 MR. ELLIOT: Okay. I look around the table  
8 and I see some familiar faces and some new faces, and  
9 I heard Bill Shack's voice.

10 I'm going to start off with I just want to  
11 give a brief background on how this program developed  
12 so everybody gets on board.

13 The license renewal process, the first  
14 couple of years we reviewed on the order of five  
15 plants from - PWRs from 1999 to 2002. We also had for  
16 PWR internals, a Westinghouse and a Babcock and Wilcox  
17 program.

18 After we reviewed the first five programs  
19 and reviewed the individual Westinghouse and B&W  
20 programs, we decided, and the industry decided, that  
21 we really needed a comprehensive program to manage the  
22 aging effects for all the PWR internals.

23 So, in 2002 EPRI began a program, a  
24 comprehensive evaluation of all PWR internals per  
25 operating reactors. This culminated in MRP-227. It

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 was submitted for staff review in 2009.

2 MRP-227 identifies PWR internal components  
3 and inspections required to ensure the aging effects  
4 are adequately managed for the period of extended  
5 operation. MRP-228 identifies requirements for  
6 inspection and qualification of non-destructive  
7 examination for PWR internals.

8 To implement MRP-227 and MRP-228, GALL has  
9 an aging management program as described in AMP 16A  
10 and a whole series of aging management line items.

11 The aging management program described in  
12 16A just follows the ten elements in SRP Appendix A1  
13 and it implements actually the recommendations and  
14 requirements in MRP-227 and MRP-228 within those  
15 guidelines.

16 MRP-227 Rev 0 is currently being reviewed  
17 by the staff. Its draft is - the draft safety  
18 evaluation is expected to be issued December 31st of  
19 this year. Final SER is to be issued - scheduled to  
20 be issued in March of next year.

21 The next slide.

22 MEMBER ARMIJO: Just how much - to what  
23 extent does the PWR vessel internals program compare  
24 to the BWR?

25 MR. ELLIOT: There's an -

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MEMBER ARMIJO: Same kind of issues?

2 Same type -

3 MR. ELLIOT: Well -

4 MEMBER ARMIJO: Or is it something really  
5 different?

6 MR. ELLIOT: It's much different.

7 BWRs have a lot of cracking, irradiation-  
8 assisted stress corrosion cracking. That's the  
9 primary - a lot of the emphasis.

10 MEMBER ARMIJO: Yes, I know that.

11 MR. ELLIOT: This is - looks at all kinds  
12 of aging effects and it's much more, you know, it's, I  
13 think, more comprehensive in that sense.

14 MEMBER ARMIJO: Primarily mechanical  
15 issues, radiation damage -

16 MR. ELLIOT: It looks at aging effects -  
17 want to go into a lot of detail, the aging effects  
18 that it looks at, looks at cracking in the mechanisms  
19 that - the mechanisms that are evaluated as part of  
20 cracking are stress corrosion cracking, PWSCC,  
21 irradiation-assisted stress corrosion cracking and  
22 fatigue. Also looked at our loss of material due to  
23 wear. Loss of fracture toughness due to thermal aging  
24 or neutron embrittlement. Change in dimension due to  
25 void swelling and loss of pre-load due to thermal and

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 irradiation-enhanced stress relaxation.

2 Those are the effects that the MRP-227  
3 looks at -

4 MEMBER ARMIJO: Thank you.

5 MR. ELLIOT: - and is intent on managing.

6 And the AMR line items are also a part of  
7 the program. MRP submitted proposed AMR line items  
8 for Westinghouse, Combustion Engineering and Babcock  
9 and Wilcox designed vessels all based on Rev MRP-227.

10 We're going to get back to that in a few  
11 minutes. We need to make some changes to that. I  
12 wanted to highlight one of the differences between  
13 GALL 2005 and 2010.

14 GALL 2005 recommended applicants to commit  
15 to participate, evaluate and implement an industry  
16 program for vessel internals and to provide an  
17 inspection plan no less than 24 months before entering  
18 the period of extended operation.

19 It was the intent of the inspection plan  
20 as a way of the NRC reviewing the program that each  
21 individual licensee was going to propose to make sure  
22 it was consistent with our MRP-227, as well as any  
23 line-specific action items result from the safety  
24 evaluation.

25 Since we now have a program and we will

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 have a safety evaluation, we don't have to wait 24  
2 months anymore for submittal of - the 24-month  
3 requirement is not necessary. So, now we are  
4 recommending that they submit the inspection plan for  
5 vessel internals for NRC review and approval with the  
6 application for license renewal in the future.

7 CHAIRMAN BONACA: Is this plan that they  
8 will use complete and cover the basis?

9 What I mean is that -

10 MR. ELLIOT: The -

11 CHAIRMAN BONACA: - we have had a number  
12 of instances where -

13 MR. ELLIOT: The safety evaluation is not  
14 complete. We will complete a draft safety evaluation  
15 this year, the end of this year. But in our aging  
16 management program, we include within the scope of the  
17 program plant-specific action items that - as a  
18 general highlight that applicants must implement the  
19 plant-specific action items.

20 CHAIRMAN BONACA: The reason why I'm asking  
21 the question is that for the boilers we got a number  
22 of applications that were set in locations which were  
23 inaccessible. And the answer was the area is  
24 inaccessible, so we would not inspect it until the  
25 industry has developed the tool and while you already

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 are doing that, I believe that there are still a  
2 number of commitments or a measure in some of the past  
3 -

4 MR. ELLIOT: I'm going to - as far as this  
5 presentation, one of the other slides talks about  
6 inaccessible, and I'll talk about inaccessible at that  
7 time.

8 CHAIRMAN BONACA: Yes, I would like to know  
9 if this also has this kind of commitments that are  
10 open ended.

11 MR. ELLIOT: Is what -

12 CHAIRMAN BONACA: What I'm saying is  
13 commitments which are open ended in the sense that the  
14 item isn't inspectible because it is not accessible.  
15 Okay. And will be inspected when the technique will  
16 be available.

17 MR. ELLIOT: This program, we discuss  
18 inaccessible and what to do about inaccessible as part  
19 of the program.

20 CHAIRMAN BONACA: Okay.

21 MR. ELLIOT: And I'll discuss it on another  
22 slide.

23 Do you want me to go to that slide now?

24 CHAIRMAN BONACA: No, that's okay. When  
25 you get there, you can tell me about it.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 MR. ELLIOT: Okay. These are the  
2 modifications the NRC made to the AMR line items. As  
3 I told you before, there were - the mechanisms were  
4 cracking, loss of material, etcetera, etcetera.

5 And for the cracking mechanisms, we  
6 decided that the applicable aging management programs  
7 was water chemistry and the PWR vessel internals  
8 program. All the other aging effects that needed to  
9 be managed, we didn't need the water chemistry  
10 program. We just needed a vessel internals program.

11 A little more background. The AMR line  
12 items identify for each component that we included in  
13 GALL, the aging effect that needs to be managed and  
14 the program that needs to be implemented to manage  
15 that aging effect.

16 Now, as part of the MRP-227 program, they  
17 went through a process and they classified each  
18 component that has an aging effect that needs to be  
19 managed during the license renewal program as a  
20 primary component, an expansion component, an existing  
21 component or a no additional measures component.

22 Now, as part of generating our AMR line  
23 items, each component that is within the GALL document  
24 is classified as either a primary component, an  
25 expansion component or an existing component within

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 the scope of MRP-227.

2 Each primary and expansion component is  
3 cross-referenced so that if you find problems in the  
4 primary component, you know to go to the expansion  
5 component to look for additional inspections.

6 Next slide. All the aging effects and  
7 components, there are two parts of the - I just want  
8 to go through the report MRP-227 real quick.

9 Section 3 of the report has the aging  
10 effects, and Section 4 has the aging management  
11 program that is needed to manage those aging effects.

12 We saw some discrepancy between the tables  
13 in Section 3 and Section 4 and that's being alleviated  
14 by the MRP now, but all of our GALL line items include  
15 only aging effects that are in Section 3.

16 We also have a line item that's called  
17 components that are - no additional measures. There  
18 are over a hundred Westinghouse and Babcock and Wilcox  
19 components in PWR internals, and about 80 in  
20 combustion engineering. There are only like 15  
21 percent of the components that are being inspected as  
22 part of this program.

23 So, this is - the no additional measures  
24 is just that there is - there are other components.  
25 Many of these components are core support structures

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 and they are examined in accordance with AMP XI.M1 as  
2 part of the ASME Code Core Support Structure program.

3 Next. Okay. Now, we get to inaccessible  
4 locations. The AMR line item, we have an additional  
5 AMR line item which is for further evaluation for  
6 inaccessible locations.

7 Some of the inspections we have done in  
8 the past and we know where the inaccessible locations  
9 are, some of the inspections are brand new, and we  
10 will find out that - we might find out that there are  
11 still inaccessible - other inaccessible locations.

12 The inaccessible locations are going to be  
13 evaluated on a plant-specific basis. So, we're going  
14 to need a way in this program commitment that as they  
15 go along, to tell us what they find out, where the  
16 inaccessible locations are and how they're going to  
17 manage those effects.

18 Currently, there are two locations that I  
19 know of that are in the program that are inaccessible,  
20 but they're both in expansion components. So, they  
21 become an issue only after we find a defect in the  
22 primary component.

23 If we find a defect in those primary  
24 components, then the licensee has to, according to AMR  
25 line item, provide us a plant-specific reason for

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 that, you know, you could still either evaluate or you  
2 would have to repair or replace those components.

3 Two components are not - the two PWR  
4 internals are not evaluated. They don't have a  
5 program. the Westinghouse guide tube support pin in  
6 the control guide tube assemblies, and the combustion  
7 engineering lower incore instrumentation thimble tubes  
8 do not have a program in this MRP-227. So, those will  
9 be plant-specific and they are identified for further  
10 evaluation.

11 MEMBER SIEBER: Yes, let me ask about that.

12 The slip pin problem was a 1980s problem  
13 where the fingers on the split pins would break off.  
14 And a lot of Westinghouse plants replaced those pins  
15 at that time. And it was blamed on the metallurgy of  
16 the pin itself and - which the replacement pins  
17 corrected that - supposedly corrected that issue.

18 Since the 1980s, has there been additional  
19 split pin breakage and malfunctions that give rise to  
20 additional surveillance?

21 MR. ELLIOT: Well, I don't have it.

22 Tim, do you have - Tim is here from the -

23 MR. WELLS: Yes, I'm here representing MRP.

24 The reason we didn't address split pins in  
25 227 is because of a replacement campaign where the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 split pins were replaced. All the split pins have  
2 been replaced of the original X750D, some have been  
3 replaced in the second campaign stainless steel, but  
4 it's all on a plant-specific schedule, you know, time  
5 to run when they did it.

6 We didn't feel we could write generic  
7 guidance other than to say that you need to have a -  
8 you need to address this item.

9 We put it in the text, not in the  
10 requirements table of 227. It's not really an  
11 inspection as much as it is a replacement campaign at  
12 the appropriate time and -

13 (Simultaneous speaking.)

14 MR. WELLS: - at a particular plant.

15 MEMBER SIEBER: Let me ask another  
16 question. Another issue that arose around that time  
17 was failures of baffle bolts.

18 MR. ELLIOT: Baffle components?

19 MEMBER SIEBER: Baffle bolts.

20 MR. ELLIOT: Baffle bolts.

21 MEMBER SIEBER: You know, the baffles are  
22 bolted together. When the bolts break, you end up  
23 with a gap. The gap gives what they call baffle  
24 jetting to the fuel assemblies which causes vibration,  
25 excessive wear and fuel failures on peripheral

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 assemblies.

2 I didn't see any mention of baffle bolt  
3 inspections or -

4 MR. ELLIOT: Okay. Baffle bolt inspections  
5 are on AMR line items. And it is at a primary  
6 component, I believe, isn't it?

7 It's a primary component. So, the baffle  
8 bolts, you know, would be a first inspection. It  
9 would have an inspection immediately when they  
10 implement this program.

11 MEMBER SIEBER: Okay. Now, the inspections  
12 are very difficult because of the location. You have  
13 to go down between the thermal shield and the baffle  
14 to get to them and shoot a right angle beam through  
15 the bolt to see if it's continuous. I think most  
16 plants have done that already too.

17 Would this be a periodic inspection?

18 MR. ELLIOT: Yes, it's a periodic  
19 inspection. Primary inspections are periodic. It's a  
20 ten-year period though.

21 MEMBER SIEBER: Yes. Okay. Okay. Thank  
22 you.

23 MEMBER ARMIJO: I just want to make sure I  
24 understand your terminology.

25 You have components that are inaccessible

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 or in inaccessible locations, but they are replaceable  
2 and repairable.

3 MR. ELLIOT: Right.

4 MEMBER ARMIJO: So, you're talking in terms  
5 of some sort of inspection equipment that would be -  
6 well, there is no inspection equipment available to  
7 inspect those. So, how do you know they need to be  
8 repaired or replaced?

9 MR. ELLIOT: If it's inaccessible, there is  
10 no inspection.

11 MEMBER ARMIJO: Right.

12 MR. ELLIOT: You're going to have to  
13 justify -

14 MEMBER ARMIJO: But if you can repair it or  
15 replace it, it's got to be accessible.

16 MR. ELLIOT: Right.

17 MEMBER ARMIJO: So, I don't understand your  
18 -

19 MR. WELLS: Really, what we mean by  
20 inaccessible for the most part, is inaccessible  
21 without disassembly.

22 MEMBER ARMIJO: Right. It's very  
23 inconvenient.

24 MR. WELLS: Well, that's right. That's why  
25 you would have to justify not disassembly, or you

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 could go ahead and disassemble either to inspect or do  
2 a replacement campaign.

3 MEMBER ARMIJO: But what that means is that  
4 the only way you know if something is wrong is if it  
5 breaks.

6 MR. WELLS: I'm sorry. I -

7 MEMBER ARMIJO: The only way you might know  
8 that something is going wrong if you can't inspect it,  
9 is it loses its function. It breaks and gives you  
10 some other indication that something's gone wrong, or  
11 it breaks and there is no indication.

12 MR. WELLS: But we reviewed the primary  
13 exams to be a pre-trip for -

14 MR. ELLIOT: For the two components that so  
15 far have been identified as inaccessible, they're  
16 expansion components. They are primary components  
17 that are the surrogate for it and its being inspected.

18 And those components are more susceptible to the  
19 aging effects than are the inaccessible component.

20 MEMBER ARMIJO: So, you're saying if those  
21 aren't cracking, then the expansions are less likely  
22 to be cracking?

23 MR. ELLIOT: If those aren't cracking, then  
24 the expansion component doesn't have to be inspected.

25 But if they are cracking, then you have to either

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 take it apart and inspect it or you're going to have  
2 to repair and replace those components.

3 It's up to the licensee to decide what  
4 path they want to take.

5 MEMBER ARMIJO: It's sort of canary in a  
6 coal mine type thing.

7 MR. ELLIOT: Sometimes it's easier probably  
8 to repair and replace than it is to -

9 MEMBER ARMIJO: Inspect.

10 MR. ELLIOT: - inspect it, yes.

11 Another area for further evaluation is  
12 reduction in ductility for fracture toughness due to  
13 neutron irradiation for Babcock & Wilcox reactor  
14 vessel internals. And this is the TLAA for that.

15 Do we have anymore for that?

16 (Off-record comments.)

17 MEMBER REMPE: How do you do that?

18 Do you take samples?

19 MR. ELLIOT: For what?

20 MEMBER REMPE: For reduction in ductility.

21 MR. ELLIOT: No. What they're going to do  
22 is since it's an analysis, they know how much  
23 ductility is lost over - how much neutron irradiation  
24 the vessel internals get. And it was originally done  
25 for 40 years, and now they've got to expand the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 analysis to 60 years.

2 They have curves that determine how much  
3 ductility is lost.

4 MEMBER REMPE: Don't they benchmark it with  
5 irradiation samples, coupons or something?

6 MR. ELLIOT: No, this is not a benchmark  
7 program.

8 MEMBER REMPE: All right.

9 MEMBER BROWN: How do you get away with  
10 that?

11 MR. ELLIOT: The benchmark program is for  
12 the vessel itself.

13 MEMBER BROWN: No, I know, but I mean for  
14 the -

15 MR. ELLIOT: Not for the vessel internal.

16 MEMBER BROWN: I'm just - I have no idea.  
17 Okay. I'm not a materials person.

18 My question is how do you extrapolate the  
19 reduction in ductility if you don't have some data  
20 points?

21 MR. ELLIOT: Oh, we have -

22 MEMBER BROWN: Are you extrapolating as  
23 opposed to -

24 MR. ELLIOT: We have test data for  
25 irradiation.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MEMBER BROWN: That's what she was asking.

2 MEMBER REMPE: That's what I was asking.

3 MR. ELLIOT: Okay. We don't have it in the  
4 vessel.

5 MEMBER BROWN: That's fine.

6 MR. ELLIOT: We have test data -

7 MEMBER REMPE: From other samples.

8 MR. ELLIOT: Yes, from other samples. We  
9 don't have it in the vessel -

10 MEMBER BROWN: Okay.

11 MR. ELLIOT: - but we do have it in the  
12 vessel for the - reactor pressure vessel. This one,  
13 we do not.

14 MEMBER BROWN: So, it's based on other test  
15 reactor type data, and then the equivalent testing  
16 that you do after it's been irradiated, etcetera -

17 MR. ELLIOT: Right.

18 MEMBER BROWN: - and temperature wise.  
19 Okay. Thank you.

20 MR. GRAMM: Thank you, Barry.

21 MEMBER BROWN: Before you leave, I'm going  
22 to pull - if I can find the page, there was one  
23 curious word that I had to ask you about back on Slide  
24 44.

25 I mean, here we're doing life extensions

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 and you use the words GALL 2005 recommended that  
2 applicants commit. And then 2010 it's recommended  
3 that they submit an inspection.

4 What if they don't?

5 MR. ELLIOT: What if they don't?

6 MEMBER BROWN: Yes. I mean, you recommend  
7 that they inspect it, but you don't - it's not  
8 required, it sounds like.

9 MR. ELLIOT: You mean, is that required  
10 that they submit it?

11 MEMBER BROWN: Well, your words -

12 MR. ELLIOT: We have commitment from them  
13 that they will do it.

14 MEMBER BROWN: You recommend -

15 MR. ELLIOT: You can only recommend. We  
16 can't -

17 MEMBER BROWN: Well, that's what you -

18 MR. ELLIOT: We can't -

19 MEMBER BROWN: Well, but then you reject  
20 their license - you reject their -

21 MR. ELLIOT: We could do a lot of things.

22 (Simultaneous speaking.)

23 MR. ELLIOT: I mean, we can't twist  
24 anybody's arm.

25 MEMBER BROWN: Well, I mean, yes, you can.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 I mean, you've got the ultimate point. I mean,  
2 nobody in the - I don't want to use those - that's too  
3 strong a word, but to me it would -

4 MEMBER STETKAR: Charlie, a NUREG is not  
5 law.

6 MEMBER BROWN: I understand that.

7 MR. ELLIOT: This is a recommended program  
8 from the NRC.

9 MEMBER BROWN: All right.

10 MR. ELLIOT: If they could do an  
11 alternative program, they could do something else and  
12 we'd have to review it.

13 MEMBER BROWN: Okay. All right.

14 MR. HOLIAN: This is Brian Holian. This is  
15 worth - I'm glad you brought that point up,  
16 recommended. I almost wanted to say that again. I  
17 know at the last ACRS meeting where we just gave an  
18 overview of license renewal aspects, I do have to  
19 remind it seems not only me, I need to be reminded  
20 myself, but my management, my staff and the industry  
21 on GALL is one way of doing it.

22 I run into troubles when sometimes the  
23 industry will say well, I satisfied GALL. And we  
24 continue to say well, on your plan and with your  
25 specific operating experience, we need more than GALL.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1           So, that's one area I just wanted to bring  
2 up earlier. And then in this case once again, the  
3 industry can come in with something else if they're  
4 smarter or have a plant-specific application that they  
5 think is better.

6           MEMBER BROWN: It's just the point is GALL  
7 has some pretty specific, you know, very highly -

8           MR. HOLIAN: Prescriptive like a -

9           MEMBER BROWN: It's got the real programs  
10 that actually allow you to draw a conclusion that  
11 everything is okay.

12           If they came in with something else, I  
13 imagine now you're going to pull us to a different  
14 wicket.

15           MR. HOLIAN: It does. It takes longer.

16           MEMBER BROWN: Which it seems like it would  
17 be very difficult to do that.

18           MR. HOLIAN: It is.

19           MEMBER BROWN: So, in fact, you have a very  
20 strong hammer.

21           MR. HOLIAN: We do, and it's supposed to be  
22 an efficiency tool.

23           (Off-record comments.)

24           CHAIRMAN BONACA: Okay. Let's go to  
25 fatigue.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MR. GRAMM: We have two more topics to  
2 cover in the mechanical area. The first is Plan 1 for  
3 fatigue, and Erach Patel and Allen Hiser are going to  
4 come to the table to deal with that.

5 And then we'll have a backup presentation.

6 Allen will stick around to talk about AMP M35 and so  
7 we'll run through some small bore piping.

8 MR. PATEL: This is a program in the TLAA  
9 section of the GALL report, which is Chapter 10. It's  
10 the fatigue monitoring program. The initial title of  
11 this was Metal Fatigue for Reactor Coolant Pressure  
12 Boundary. However, with this program, AMP compresses  
13 more than just reactor coolant pressure boundary. So,  
14 we renamed the program to Fatigue Monitoring.

15 Some of the basic changes we made are we  
16 just updated the program description, etcetera, to  
17 make sure that we had proper background basis,  
18 assumptions, and basis for environmental fatigue  
19 calculation is properly called out.

20 We updated and provided specific guidance  
21 for how you calculate environmentally-adjusted  
22 cumulative usage factor for carbon and low alloy  
23 steels, austenitic stainless steels and for nickel  
24 alloys. We provided the NUREG and how you combine  
25 them.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1           We clarified the scope to very clearly  
2 establish that this includes locations identified in  
3 NUREG/CR-6260 as a minimum which we ordered that, and  
4 additional plant-specific component locations that  
5 they may be more limiting than those considered in  
6 NUREG/CR-6260.

7           And we provided some clear basis on how  
8 the tracking of the cycles can be used to ensure the  
9 validity of current designs. In other words in  
10 monitoring and training, make sure that the CUF  
11 remains below the design limit minimizing the fatigue  
12 of the components.

13           And the understanding is that cracking is  
14 assumed to have started when CUF reaches a value of  
15 1.0. If you're monitoring and planning it and you're  
16 planning towards that, then it gives indication of  
17 what additional steps to take to ensure that it remain  
18 below 1.0.

19           This TLAA then brings into the SRP-LR  
20 Section 4.3, which is Metal Fatigue. Again, the TLAA  
21 usually is dispositioned in three categories. What we  
22 call Category 1, 2 and 3.

23           One will be that it remains valid for the  
24 period of extended operation. Two being we projected  
25 it to the end of extended cycle. And Three being that

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 we're going to manage it.

2 In the 2005 version, this was not very  
3 clearly established in all of the different  
4 subsections that we had. So, this primarily clarified  
5 and made sure that all those three categories were  
6 clearly established for all of the different  
7 subsections that we had in there.

8 We also consolidate - we had separate  
9 section for 31.1 components and separate for Code  
10 Class 2 and 3. The concerns are those two together  
11 because there would be some components, 31.1  
12 components of Code Class 2 and 3 that may have been  
13 designed to Section III requirements. In which case  
14 they would fall under this particular TLAA program.

15 And we added section that we didn't have  
16 before that may be applicable to BWR vessel internal  
17 components. And another section for potential fatigue  
18 flaw growth analyses. And the environmental  
19 fatigue cumulative factor section that we addressed in  
20 M1 as to which NUREG to use for carbon low alloy,  
21 etcetera, were carried forward into Section 4.3.

22 CHAIRMAN BONACA: Good.

23 MEMBER STETKAR: We don't have these, do  
24 we?

25 MR. GRAMM: Unfortunately, no.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1                   MEMBER     STETKAR:     Bill,     for     your  
2     edification, this is the blank slide in your package.  
3     It's page 48A.

4                   MR. GRAMM: You did receive a slide very,  
5     very similar to this as part of - this was - we  
6     actually presented this at the May workshop. And so  
7     you have the material. It just wasn't included in the  
8     package with the slides for today.

9                   DR. HISER: Since we have a blank slide for  
10    Bill, I'll just sort of read through real quickly and  
11    maybe we'll get to some questions.

12                   Program description of M35, onetime  
13    inspection of ASME Code Class 1 small bore piping,  
14    program description was revised to explicitly identify  
15    that socket welds are included.

16                   There was a significant ambiguity in the  
17    AMP in the way applicants interpreted and, in all  
18    honesty, in the way that staff had implemented it.  
19    So, we wanted to make it clear that socket welds are a  
20    part of this program.

21                   We clarified the program applicability to  
22    plants that have not experienced cracking or have  
23    effectively mitigated cracking from vibratory loading  
24    through design changes.

25                   And I think we discussed that somewhat in

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 some of the recent subcommittee and maybe even full  
2 committee meetings where if one has a vibratory  
3 loading in a specific location and has a failure, goes  
4 back and makes design changes and positively  
5 identifies that there have been no more failures, then  
6 that would enable the applicant to continue to use a  
7 onetime program.

8 If there have been failures that have not  
9 been mitigated through design changes, then - or the  
10 design changes were not adequate if they continue to  
11 have failures, then a plant-specific periodic  
12 inspection program is needed by that applicant.

13 In terms of detection of aging effects,  
14 the AMP was revised to clearly identify that for  
15 socket welds, that an applicant can perform an  
16 opportunistic destructive examination as an  
17 alternative to volumetric examinations. The word  
18 "opportunistic" is important. We don't want to direct  
19 destructive examinations. But if an applicant is  
20 making design changes to the plant, is doing some  
21 replacement that would involve replacement of socket  
22 welds, then that opportunity to do a destructive  
23 examination is credited within this program.

24 The AMP was also revised to clarify that  
25 for full penetration welds, that only volumetric

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 examination is recommended. The geometry here lends  
2 itself more readily to a volumetric exam than would a  
3 socket weld.

4 In addition, we clarified that the  
5 volumetric examinations in particular for the socket  
6 welds are to be - or can be performed using  
7 demonstrated techniques.

8 And this is where we, again, had some  
9 clarification issues with the industry. The word  
10 "qualified," I think, was in there previously and it  
11 was interpreted by the industry to mean a performance  
12 demonstration initiative, sort of a qualification.  
13 And we wanted to clearly indicate that this is a  
14 technique that the applicant has demonstrated in the  
15 tech, the types of degradation that they're looking  
16 for.

17 So, it becomes more of a go/no-go  
18 inspection. If you - since it's a onetime exam,  
19 you're looking for degradation. If you find it, then  
20 you've become a periodic program because now you have  
21 identified cracking.

22 The qualification really relates more to  
23 depth sizing and characterization of a flaw. This  
24 program really cares that you - if you have a flaw or  
25 not.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1           If you need to characterize it, that  
2 really falls under a repair, a replacement or accept  
3 sort of an evaluation. And that really is not a part  
4 of this program specifically.

5           Clearly, it's important to the applicant  
6 that they need to be able to characterize the flaw,  
7 but it doesn't - it isn't necessary for this program.

8           That's all that I have, if you have  
9 questions.

10          CHAIR BONACA: If you inspect, okay, and  
11 find the plant at 40 years of operation or 35, does  
12 not have any welds failed, okay, now you're committing  
13 not to inspect anymore until the end of life, 60  
14 years.

15          DR. HISER: That's correct. This program  
16 is mainly looking at environmental effects. It is  
17 coupled to a water chemistry program and it's really -  
18 this onetime inspection is principally looking at  
19 verification that the water chemistry program has been  
20 effective in -

21          CHAIRMAN BONACA: Let me continue my  
22 thought process.

23          Then we are seeing other plants coming up  
24 with welds cracked, okay, and now this is becoming a  
25 more common phenomenon.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1           Now, how far do you have to go looking at  
2 the old plants, to conclude that all of them should  
3 have a program of inspection?

4           I mean, at some point it came out, you  
5 know, I don't know what the criteria could be, but you  
6 conclude that you have to be - should have inspection  
7 in all the plants.

8           DR. HISER: Yes, that falls back into the  
9 back-fit discussion that I know we've addressed  
10 several times at subcommittee meetings. And we do not  
11 have at this time, I believe, a specific activity that  
12 would enable us to go back and back-fit each plant  
13 through a very formal process.

14           I think as Brian has spoken, there are  
15 other indirect ways that we are looking to try to see  
16 how applicants who have already been approved for  
17 license renewal through our inspection process in  
18 particular, to see how they have picked up on industry  
19 OpE and how they have implemented that within their  
20 program.

21           So, I think there is an expectation that  
22 they at least need to be cognizant of the OpE and  
23 assess the significance of it to their plant. But we  
24 do not have right now a mechanism that we can go in  
25 and force the 59 plants that already have renewed

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 licenses, to implement a socket weld inspection  
2 program.

3 MR. DOZIER: Yes, and let me interject a  
4 little on that. Realize that these are the  
5 inspections for the onetime inspection program, but  
6 these also - they do get as part of their Part 50,  
7 they do get BT2 examinations also.

8 So, they - I almost heard - I think I  
9 heard your question as they wasn't being looked at at  
10 all. The truth is they are being looked at as BT2.

11 Now, we have added things based on their -  
12 what type of failure mechanism that we are seeing. We  
13 have added some specific things.

14 DR. HISER: Yes.

15 MR. DOZIER: You know, for example, in  
16 high-cycle fatigue, you know, we see that as a  
17 vibration issue. And so we want to look - and that  
18 vibration issue is from the inside of the weld. And  
19 so we can't see that from visual detection. And also  
20 it would have to totally break before we could see it  
21 through the BT2 examination. So, that's why we have  
22 this additional volumetric inspection for the small  
23 bore piping.

24 Similarly with stress growth and also we  
25 saw with different sample sizes in some of these

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 presentations, sometimes what was recognized was  
2 stress corrosion cracking. It could be more of bad  
3 chemistry or, you know, increase in chloride content,  
4 things of that nature.

5 And so it wasn't a vibration issue that  
6 was kind of isolated to a system. It was all over the  
7 place because the chemistry program goes into all of  
8 those valves.

9 Did that kind of address that question?

10 CHAIRMAN BONACA: I think so. I mean, I'm  
11 not going to - I'm only saying that many of this aging  
12 mechanism if you look at the performance today at 35  
13 years of age, is not really a problem. Is that you  
14 will not have a problem in the next 25 years of age  
15 because, I mean, components age and probably things  
16 will get worse.

17 And I think that at some point as you're  
18 doing your cracking issues, you're making sure that  
19 they - you have the proper actions responding to that.

20 DR. HISER: Now, another thing that I think  
21 we'll clearly use in the future is plants do these  
22 inspections. If they start to find cracking, then  
23 that may change the way that the NRC deals with that  
24 issue.

25 CHAIRMAN BONACA: Yes.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 DR. HISER: But at this point, that's  
2 speculative. We will have more information from those  
3 inspections.

4 CHAIRMAN BONACA: As you did for the buried  
5 piping. I mean, because five years ago we didn't have  
6 a problem with that, and now we do.

7 DR. HISER: Yes.

8 MR. DOZIER: Actually, even in this  
9 particular case in the case of stress corrosion  
10 cracking, we had a lot of problems actually in the  
11 '80s if you look at the operating experience. And  
12 industry at that time, was proactive in making several  
13 design changes to increase their thing.

14 Now, we're going one step further, though,  
15 in that we're looking to see that hey, you know, if  
16 you fixed your stress corrosion cracking problem, you  
17 know, that's, you know, through a design change, we  
18 can understand that.

19 But if you're seeing stress corrosion  
20 cracking, say, in 2004 like we actually saw in one  
21 plant, then we expect more.

22 CHAIRMAN BONACA: Thank you.

23 MEMBER STETKAR: Allen?

24 DR. HISER: Yes.

25 MEMBER STETKAR: I hope you anticipated

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 this one. I was kind of disappointed because I was  
2 over the last several license renewal applications  
3 that we've gone through, I've asked about what sort of  
4 basis does the staff use for establishing a reasonable  
5 sample size for these inspections. And I was told,  
6 well, when we see Rev 2 of the GALL, you'll be  
7 satisfied.

8 I'll read the quote just to get it on the  
9 record. "This inspection should be performed at a  
10 sufficient number of locations to ensure an adequate  
11 sample."

12 I certainly can't argue with that  
13 statement. Indeed, that sounds reasonable.

14 "This number or sample size is based on  
15 susceptibility, inspectibility, dose considerations,  
16 operating experience and limiting locations of the  
17 total population of ASME Code Class 1 small bore  
18 piping locations."

19 In many other areas of Rev 2 of the GALL  
20 report, you've taken care to specify things like ten  
21 percent of the population, 20 percent of the  
22 population with a maximum of 25, the maximum of 25  
23 being some assurance of 90 percent confidence of 90  
24 percent detection.

25 Here, it's entirely silent. So, this

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 seems to leave us back to a applicant-to-applicant  
2 negotiated number of samples based on some  
3 indeterminate set of criteria.

4 So, I'd like you to comment on that  
5 because I was expecting to see more explicit guidance  
6 on how I determine what that sample size is.

7 And especially considering that you've  
8 been very explicit and tried to be very explicit in  
9 other areas so there isn't this variability so the  
10 industry knows what to expect.

11 DR. HISER: Let me tackle one thing first.

12 This is a onetime inspection, but there are numerous  
13 plants that we've reviewed applications for recently  
14 that have found cracking previously and they are doing  
15 periodic.

16 So, this is - this AMP doesn't cover all  
17 plants necessarily, which is -

18 MEMBER STETKAR: Okay. So, I'm one that  
19 hasn't. Tell me how many -

20 DR. HISER: So, you're one that hasn't.

21 Many of the good words in that citation  
22 are the kinds of things that we considered. If a  
23 plant has had a problem with maybe high-cycle fatigue  
24 or other things like that where they made design  
25 changes, the number of welds within the plant - I'll

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 cut to the chase. Many plants have proposed to  
2 inspect ten percent of the welds.

3 MEMBER STETKAR: Okay. But I'm looking at  
4 - we had a very good presentation on buried piping  
5 inspection where based on different criteria,  
6 different sample sizes were proposed.

7 DR. HISER: Right.

8 MEMBER STETKAR: And here, yet, this is  
9 completely silent. There is - it sounds like a  
10 negotiated amount.

11 I don't care whether - some people have  
12 proposed ten percent. That's been accepted. Some  
13 people have proposed a total of three, you know, out  
14 of a population of several hundred, and that's been  
15 accepted in the past. And it sounds like we're just  
16 perpetuating that process here.

17 MR. DOZIER: For saving frequencies and for  
18 selecting sample sizes, okay, for small bore piping we  
19 had - Dave Alley when he gave the presentation on  
20 small bore piping, he said we have a philosophy. He  
21 used the term "philosophy."

22 Okay. And basically realize that if you  
23 read the GALL AMP, it's not totally prescriptive. We  
24 have to have very experienced - and the people that  
25 you saw today, we, you know, very experienced.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1           Our reviewers are very experienced. We go  
2 out for thousands - we spend thousands of man-hours  
3 writing hundreds of RAIs and actually making these  
4 tough decisions. That's why we use the people that we  
5 do.

6           We've got, you know, recognized industry  
7 experts that goes on these things to make those  
8 determinations that the effects of aging are being  
9 managed, but we're also careful in not being too  
10 prescriptive. But especially in a case, say, for  
11 small bore piping where it's a little more  
12 complicated.

13           MEMBER STETKAR: Well, I'll come back to -  
14 I understand you don't want to be too prescriptive,  
15 but I don't - can't find the slide here and we're  
16 running short on time, but those large tables for  
17 buried piping are pretty doggone explicit. They're  
18 very explicit.

19           And I'm just trying to understand from an  
20 applicant's perspective going in to submit my license  
21 renewal application and identifying the fact that I  
22 have to implement M35 to some extent, I'm going to  
23 propose some type of sampling scheme and I'm not - and  
24 I'm probably going to go in and propose - Jack says  
25 I'm going to start with one weld, and at which point I

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 guess we start negotiations.

2 And I recognize you have experience, but  
3 I'm wondering whether or not there should - whether  
4 there could or should be -

5 DR. HISER: Yes.

6 MEMBER STETKAR: - more sort of  
7 performance-based guidance here --

8 MEMBER ARMIJO: I don't think --

9 MEMBER STETKAR: - in the same sense as  
10 some other areas.

11 MEMBER ARMIJO: I think I understand the  
12 staff's philosophy and their approach based on an  
13 understanding of the mechanisms that are causing these  
14 failures, based on the inspections that have been  
15 done, the operational experience on a given plant.

16 But, you know, it would be nice to have  
17 some number just so there's a minimum number of  
18 inspections that you would expect whether they're BT  
19 or volumetric or whatever, just for the convenience of  
20 the applicant to know what the starting number is  
21 going to be.

22 And the number, in some cases, even though  
23 they could negotiate you down to zero if they had a  
24 basis.

25 MEMBER STETKAR: With adequate

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 justification. That's right.

2 MEMBER SIEBER: There should be a technical  
3 justification. And the application of that should be  
4 consistent across licensees.

5 MR. DOZIER: And actually on that -

6 MEMBER ARMIJO: We've seen two good  
7 examples in license renewals recently on small bore  
8 piping. One with very good experience and they  
9 understood the root cause, they fixed it and the  
10 problem is solved. So, they should not be forced to  
11 go through extensive inspection.

12 The other one had some problems and hadn't  
13 quite resolved them yet and your - so, it all looks  
14 fine to me. It's just your starting point. There  
15 ought to be a number for a minimum, and you show us  
16 why that's -

17 DR. HISER: Well, I think if you look at  
18 some of the more recent applications, I mean, I think  
19 a number of ten percent is one that shows up very  
20 frequently.

21 I know in some cases plants have done an  
22 examination of their piping and have identified areas  
23 that they say are the most susceptible. And so they  
24 have committed a focus on those areas. And I think in  
25 some of those cases may be where the numbers are less

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 than ten percent.

2 MEMBER STETKAR: But again, Allen, that's  
3 no different philosophically from that large table -

4 MEMBER SIEBER: For buried piping.

5 MEMBER STETKAR: - for buried piping. The  
6 same type of philosophy folds into that guidance.  
7 Better protection, a susceptibility. The term "risk"  
8 was used. A risk-based informed ranking of how I  
9 select a sample, a sample size determined based on  
10 estimation of essentially susceptibility,  
11 vulnerability based on, in that case, different levels  
12 of protection.

13 I'm not sure why a similar type of  
14 guidance, perhaps not quite as involved, couldn't be  
15 developed here just to ensure some -

16 DR. HISER: I understand the committee's  
17 concern and maybe we'll go back and take a look at it,  
18 see if we can add some additional guidance to this.

19 I think philosophically I think we do have  
20 a philosophy we have used in this and I think it is -  
21 maybe isn't numerically consistent plant to plant from  
22 a numbers perspective. But I think in terms of the  
23 reasonable assurance that each plant's program  
24 provides to us, I think there is - that's where the  
25 commonality occurs.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 So, we will look.

2 MR. DOZIER: On that note, we have been  
3 monitoring ourselves to make sure that we're, you  
4 know, for example, the ten percent number, we know  
5 that we use that at Duane Arnold and Palo Verde  
6 because of - because of bad experience -

7 MS. GALLOWAY: Jerry and Allen, we'll just  
8 go back and we will take a look at what we can do to  
9 provide better definition in the GALL.

10 MR. DOZIER: Okay.

11 MR. MOW: Jerry, could I - this is Mike Mow  
12 (phonetic) with Constellation Energy. To alleviate  
13 some of John's concern vis-a-vis the plant that only  
14 had to do - committed to do three volumetric  
15 inspections, they had done 12 destructive  
16 examinations.

17 MEMBER STETKAR: I understand that. And my  
18 only point is looking forward to the remaining  
19 applicants that come in, can there be some documented  
20 set of guidance?

21 The staff has said there's a philosophy.  
22 Well, if there is a philosophy, perhaps it could be  
23 tabulated or something because there's certainly  
24 definitely a philosophy with respect to, for example,  
25 the buried piping.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MS. GALLOWAY: Yes, we fully understand  
2 your point and your comparison to what we've done in  
3 buried piping, and that AMP is a good one. And we  
4 will take another look.

5 MR. DOZIER: And, actually, that same type  
6 of topic will be - I'm doing kind of a special  
7 presentation after the end of this to address those  
8 concerns.

9 MEMBER STETKAR: Okay.

10 MR. GRAMM: And this is our summary slide  
11 for the GALL update documents. Again, we believe  
12 we've taken a pretty thorough look at the intervening  
13 time frame from Revision 1 and factored in a lot of  
14 lessons learned, operating experience, results,  
15 insights and the constructive input from external  
16 stakeholders. And we've made enhancements to the  
17 documents which are going to enhance their usefulness  
18 to the industry in terms of framing their applications  
19 that come in for the future.

20 And just to let you know, we do have a  
21 requested waiver of CRGR review pending. That was  
22 waived for the two - both Revision 0 and Revision 1,  
23 and we believe we'll receive the same treatment.

24 So, no need for a CRGR review because  
25 there's no back-fit considerations in these types of

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 documents.

2 Okay. Jerry has two slides that he's  
3 going to talk about for considerations of Revision 2  
4 changes on current applications that are in-house.

5 MR. DOZIER: Okay. Actually, the small  
6 bore piping AMP that we just talked about segues  
7 perfectly into this portion of the presentation.

8 This is separate because this portion of  
9 the presentation will address an earlier ACRS question  
10 in licensing space regarding how the staff considers  
11 Revision 2 changes on current license renewal  
12 applications.

13 We have provided the information about the  
14 update. Now, we'll talk about some aspects of the  
15 implementation. So, that's why this is different.

16 In the first bullet, using experienced  
17 personnel, public and industry comments, operating  
18 experience and lessons learned over the past five  
19 years have resulted in improved information in the  
20 GALL report Revision 2 aging management programs which  
21 we've all seen today.

22 In the matter of experienced personnel, I  
23 did want to also address that there were several of  
24 these people that have been involved in the review of  
25 the applications, as well as all of these updates.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1           For example, Hans Ashar, Dr. Amy Hull,  
2 Erach Patel, Barry Elliot, Allen Hiser, and also we  
3 had input from over 120 members. And these members  
4 are not only the ones that were a lot of them that  
5 actually provided the update, they are the reviewers.

6           So, this philosophy of review and the  
7 update is a very important point that I wanted to  
8 make.

9           Also in that, you know, we talk about  
10 public and industry comments. We had comments from  
11 the public that was very, very helpful to us  
12 especially in the area of small bore piping - I mean  
13 buried piping. I'm sorry.

14           And we also participated with the industry  
15 things to - industry people to make it more  
16 implementable.

17           And the last thing is on lessons learned,  
18 we've been writing requests for additional  
19 information. You've seen the hundreds of requests for  
20 additional information that we've done on each  
21 application to get to the right solution to make sure  
22 that we have a reasonable assurance that the effects  
23 of aging will be managed in the experience period.

24           Okay. The second bullet. We're reviewing  
25 the Revision 2 changes to identify significant issues

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 that warrant review in the current in-house  
2 applications. This is a formal process that we're  
3 going through.

4 We're taking the big picture changes of  
5 each one of the changes to see if there is a  
6 significant change that warrants us going back and  
7 looking at the in-house applications.

8 MEMBER ARMIJO: So, these are people who  
9 have submitted based on GALL 2005.

10 MR. DOZIER: Revision 1. That's right.

11 And so of course, you know, they're not -  
12 Revision 2 hadn't been issued yet. We're being  
13 proactive in going ahead and looking at this.

14 Okay. So, in the - so, we're reviewing  
15 those in-house applications. The next thing we're  
16 doing is we're making sure as Dr. Stetkar had asked,  
17 you know, are we being - are we considering the things  
18 that we do in the update on our in-house applications.

19 We have already been proactive in doing  
20 that in buried piping. You've seen it in small bore  
21 piping. The steam generator divider plate was another  
22 one of the issues, low-voltage cable. Some of those  
23 in-house applications, we're already sending them RAIs  
24 to see what they did.

25 We're going to evaluate that information.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 And the last bullet here, the RAIs are commitments to  
2 make sure they have reasonable assurance that the  
3 effects of aging are being managed.

4 I'm in a hurry, and so I'm stuttering. I  
5 don't want to take this too far out. But I do want to  
6 make a point, though, that as we said before in this  
7 last bullet, you know, for those very significant  
8 things that were changed, we're going to look at our  
9 philosophy to see if we were - we're making sure that  
10 aging effects were being managed appropriately.

11 But I do want to tell you that we have  
12 very high, you know, and basically in our reviewers,  
13 they're very experienced reviewers. They have - each  
14 one - each time they go out to do their reviews, they  
15 look at, you know, of course these AMPs.

16 I want to go a little bit to the side.  
17 These AMPs, they're only about two or three pages  
18 long. When we go and review at the site, we look  
19 through volumes of information to make the  
20 determination that we're being - that we're meeting  
21 the intent of this GALL program.

22 So, that's why we spend those multiple  
23 hours, we write those hundreds of RAIs and we  
24 scrutinize each application to make those decisions on  
25 is this good enough for us to move forward.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 With that, we'll go to the second slide.

2 MR. HOLIAN: I don't know if we need to go  
3 into - it's up to the committee on - this is some of  
4 the philosophy that we wanted to answer really with a  
5 consistency look at the in-house 15 plants that are in  
6 here and we're applying GALL Rev 2.

7 We are - may be spending our time on small  
8 bore piping on those applications, and maybe we forgot  
9 to go back and get a little detail in on the small  
10 bore piping in the GALL which was written back about  
11 six months ago.

12 So, I don't know if we need to go through  
13 the flowchart unless -

14 MR. DOZIER: Maybe not in any details, but  
15 I do want to bring out an important point about, let's  
16 say, changes in staff position.

17 Okay. We do typically do that through our  
18 RAI process. We catch that during the update process  
19 to try to get rid of those RAIs. And that's what  
20 you've really seen in this update. That's very  
21 important.

22 The right-hand side - this right-hand side  
23 about the future, you know, we want to develop ISGs,  
24 we want to update our guidance to do the right thing.

25 On the left-hand side though, we want to

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 emphasize that fact on the RAIs and that in the end,  
2 will ensure that the aging effects are being managed.

3 So, without going into much details,  
4 that's the high level of that - of what we're doing.  
5 And I could go in detail if you'd like.

6 CHAIRMAN BONACA: I don't think so. First  
7 of all, I want to thank you for the presentation which  
8 was very good, very informative. I think we got a  
9 real understanding of the basis for the change. We  
10 can talk about NUREG 1950. And you made a statement  
11 before that I think should be made in front of the  
12 committee.

13 MR. DOZIER: Yes, the NUREG - the GALL  
14 report and the standard review plan are standalone  
15 documents. These are the documents our reviewers rely  
16 on. These are the documents that our reviewers use.  
17 And these are the documents that the committee is  
18 familiar with seeing and has given us some very good  
19 advice on.

20 Throughout our applications, you guys have  
21 given us very good advice to help us to update these  
22 documents. And you even made the recommendation for  
23 us to update them.

24 NUREG 1950, however, is a tool that we  
25 have that we're using for knowledge transfer. So, the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701



1 next time these are updated, I know that the basis  
2 document that we did in 2005 was helpful for us in  
3 this update.

4 We want to have a good knowledge  
5 management program, and this document is good for  
6 that. So - and we're asking the ACRS Committee for  
7 endorsement of the GALL report and the standard review  
8 plan. And we'll be glad to provide a draft of this  
9 document to you guys.

10 CHAIRMAN BONACA: Okay.

11 MS. GALLOWAY: Just to emphasize what Jerry  
12 is saying, 1800 and 1801 are applicable and useable on  
13 their own. They do not need 1950 for any utility.

14 Also, to reinforce our view of the  
15 difference between 1800 and 1801 as guidance documents  
16 and 1950 as not, 1950 is able to be signed out at a  
17 lower organizational level, at the division level,  
18 than 1800 and 1801, again, reinforcing the consistency  
19 of how we view the difference between those documents.

20 CHAIRMAN BONACA: I would like to have a  
21 copy of the last slide on the small bore piping.

22 I think at this stage we are going to go  
23 around the table just to get feedback from members,  
24 and then we will adjourn.

25 Jack, I'll start with you.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 MEMBER SIEBER: I guess I have nothing, no  
2 additional comments beyond those that have already  
3 been made during the subcommittee meeting. Thank you.

4 CHAIRMAN BONACA: John.

5 MEMBER STETKAR: I'd like to thank the  
6 staff. By the way, I think the staff is doing a  
7 really good job on these license renewal inspections  
8 and things. I've actually been really impressed and I  
9 can see how that experience has fed into this Rev 2 of  
10 the GALL report.

11 I think it's a substantial improvement, it  
12 clarifies a lot of things, but I just wanted to say  
13 that. I think you guys are doing really well.

14 And other than, you know, the comments  
15 that I made already, I don't have anything else to  
16 add. Thank you.

17 MEMBER ARMIJO: Yes, same position. The  
18 initial GALL report, I believe, was a landmark  
19 document and I think you've improved it. You brought  
20 it up to date.

21 And I think as far as the applications  
22 that are in-house right now, everyone in the industry  
23 knew what was coming. The issues of buried piping,  
24 the issues of cables and all of these things people  
25 are aware of and need to manage it, and so I think

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 it's just an evolutionary process.

2 It's good to have stable guidance. Okay.

3 But at the same time, you can't ignore what's  
4 actually happening in the field. So, I think it's a  
5 really good job. Appreciate the presentation.

6 MEMBER RYAN: Well, I second the comments  
7 of my colleagues. It's, I think, impressive to me  
8 that you seem to have a very effective self-assessment  
9 activity going on concurrent with using the documents  
10 and that's hard to do. But in this case, it looks  
11 very successful and you've really improved the  
12 documents as a result of that.

13 So, congratulations and thank you.

14 MEMBER BROWN: Again, I'm going to echo -  
15 sound like an echo chamber here. There were some good  
16 comments. It was a good presentation. I think I got  
17 a lot out of the buried piping part. I've heard a lot  
18 of it in several of the plant license review renewals  
19 and this is a very good, detailed look at how that's  
20 going to be managed and how you've taken lessons  
21 learned.

22 So, I thought was good from my viewpoint.

23 So, thanks.

24 CHAIRMAN BONACA: Joy.

25 MEMBER REMPE: I don't have any additional

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1 comments, but I wanted to add my thanks too. I found  
2 the information very informative.

3 CHAIRMAN BONACA: Yes, I would like to say  
4 that I was impressed by the changes made. In  
5 particular when we did the first revision 2005, we put  
6 a recommendation in the letter that said that the  
7 staff should consider updating the GALL document  
8 periodically. And then at that time, of course the  
9 staff had misgivings in part because it is a big  
10 workload, a big effort.

11 And, yet, clearly from reading the  
12 document now, their date, number two, you can see how  
13 much has changed between 2005 and 2010. I mean, so  
14 many things have come of age and we have to put them  
15 inside the GALL. And the GALL has become, I think, a  
16 much better document than it was before.

17 MEMBER SHACK: Mario, if I could just make  
18 a couple comments?

19 CHAIRMAN BONACA: Yes. I'm sorry.

20 MEMBER SHACK: We focused in the  
21 presentation, on the certain new guidance that was in  
22 the GALL. One of the things that have impressed me  
23 was how many changes you made in things where the  
24 basic guidance really hadn't changed, but you had done  
25 so much clarification, you know.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

1           Sort of just reading through on a sampling  
2 basis, I looked at the flow-assisted corrosion section  
3 on Checkmate and it really just reads a whole lot  
4 better. It's a lot more informative. It's just an  
5 impressive amount of work that you've done in cleaning  
6 up the whole document, as well as adding the new  
7 updated guidance.

8           CHAIRMAN BONACA: Yes, that's true. So,  
9 anyway, my comment is that it's a valuable effort. If  
10 we write a letter, I'm sure we will write one, there  
11 may be still recommendation there that periodically  
12 you should update the GALL.

13           Okay. With that, is there any other  
14 comments from the members or the public?

15           Hearing none, this meeting is adjourned.

16           (Whereupon, the meeting was adjourned at  
17 12:11 p.m.)

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

# ACRS SUBCOMMITTEE MEETING UPDATED LICENSE RENEWAL GUIDANCE DOCUMENTS

Division of License Renewal, NRR

10/22/10

Bob Gramm

NRR/DLR/Aging Management Reactor Systems and  
Guidance Updates (RARB)

# ***License Renewal Guidance Document Update Presentation - Agenda***

- Background (Bob Gramm/NRR)
- Overview of Standard Review Plan - LR changes (Bob Gramm/NRR)
- Overview of GALL Report changes (Erach Patel/ATL)
- Overview of draft NUREG-1950, technical bases and public comment disposition (Amy Hull/RES)
- Overview changes to electrical aging management programs (Matt McConnell and Cliff Douth/NRR)
- Overview of changes to structural aging management programs (Hans Ashar/NRR)
- Overview of changes to mechanical aging management programs/TLAAs – (Dave Alley and Barry Elliot/NRR and Erach Patel/ATL)

# ***License Renewal Guidance Document Update: Participants***

- Involvement of over 90 staff/managers from NRR Div. Of License Renewal, NRR technical divisions, RES, regional staff, and contractors
- 38 staff and managers from NRR/Div. of License Renewal
- 30 staff and branch chiefs from other NRR divisions
  - Including Divisions of: Component Integrity, Engineering, Safety Systems, Inspection and Regional Support, and Risk Assessment
- 16 staff and branch chiefs from multiple RES branches
- 2 Region I staff
- 11 contractors (Advanced Technologies and Laboratories – ATL)
- Expert panels comprised of subject matter experts



# ***License Renewal Guidance Document Update: Stakeholder Interactions***

- Extensive interaction with external stakeholders (industry and public)
  - Several NEI comment letters on AMPs and Aging Management Review (AMR) line items in 2009
  - Public workshops in January and May 2010
  - Formal 45 day public comment period in 2010
  - External stakeholder comment letters in 2010
  - Public meetings in 2010, several related to buried piping AMP

# ***License Renewal Guidance Document Update: Background***

## **Focus on Aging Management Program (AMP) content**

### **Items considered for integration into Revision 2:**

- Domestic and foreign operating experience (2004-2009)
- Lessons learned from recent LR applications/SERs
- NEI/industry and other external stakeholder comments on GALL Report and SRP-LR
- Material Reliability Program (MRP) 227 input on PWR internals
- Interim Staff Guidance
- New industry guidance and change of regulations

# ***General changes to the Standard Review Plan-LR***

## **General revisions made to SRP-LR**

- Revised Appendix A, Section A.1.2.3, AMP Template Elements
- Clarified TLAA Tables 4.1-2 and 4.1-3

## **Specific revisions to SRP-LR to conform with GALL changes**

- Further evaluation sections aligned with GALL Report
- Tables aligned with AMR item changes

# Changes to the GALL Report

- Consolidated two volumes of GALL Report into a single volume; all pertinent information was moved into GALL Report and SRP-LR
- Revised Chapter I for application of the ASME Code:
  - AMPs are based on the 2004 Edition of the Code; other editions and addenda are allowed as per the footnote in the GALL Report AMP
  - Clarified use of Code Cases and Relief Requests

# Changes to GALL Report - continued

## Generic Changes to GALL AMPs

- Added relevant Operational Experience post-GALL 2005
- Updated References to reflect changes post-GALL 2005
- Aligned AMP content with 10-element template for AMPs in the SRP-LR, Appendix A.1
- Added relevant information from recent license renewal applications (LRAs) and precedents
- Updated to ASME Code 2004 Edition and added a footnote
- Preamble added to Chapter XI to provide guidance on the use of later editions/revisions of various industry documents, and to aid applicants in the development of their LRAs

# Changes to GALL Report - continued

- Added Chapter VII.E5 for Waste Water System to include liquid waste systems, such as
  - liquid radioactive waste
  - oily waste
  - floor drainage
  - chemical waste water
  - secondary waste water

# Changes to GALL Report - continued

A number of AMR Item recommendations for Further Evaluation were changed from “Yes” to “No” based on augmentation of AMP and/or experience. For example:

- Combination of Water Chemistry & One-Time Inspection programs

A number of AMR Items were revised from being managed by a plant-specific AMP to a GALL AMP. For example:

- Neutron absorbing materials other than Boraflex are now managed by AMP XI.M40

# ***NUREG-1950: Disposition of Public Comments and Technical Bases for Revision to LRGDs***

- Provides comprehensive bases for revision of NUREG-1800 and NUREG-1801 and disposition of public comments in one volume
- Explains overview of global, generic, or systematic changes
- Analyzes findings from review of operating experience
- Contains NRC staff analysis of public comments received on Rev. 2 drafts
  - Documents disposition of comments accepted by NRC staff and used as basis for instituting a change to either GALL or SRP-LR.
  - Presents technical basis for the staff's disagreement with, and disposition of, those public comments that did not result in a change



# Changes to 'Bases Document'

- NUREG 1950 consolidates information comparable to that found earlier in:
  - NUREG-1832, *Analysis of Public Comments on the Revised License Renewal Guidance Documents*, 658 pp, September 2005.
  - NUREG-1833, *Technical Bases for Revision to the License Renewal Guidance Documents*, 718 pp, October 2005.
- Information for public comment disposition and technical bases contained in same document because of closely related content
- More direct linkage between analysis and disposition of public comments (ch. IV) and resulting revisions in GALL(ch. II) and SRP-LR (ch. III)
- More detailed focus on revision of existing AMPs and generation of new AMPS
- Appendix A cross-walks between Rev. 0, Rev. 1, and Rev. 2

# ***AMP XI.E3, Inaccessible Power Cables not Subject to 10 CFR 50.49 EQ Requirements***

Significant changes to XI.E3 are based on plant specific and industry operating experience (IN 2002-12), responses to the GL 2007-01, LR inspections and audits, and Division of Engineering and Office of Research input and include:

- *Scope of Work*
  - revised to include all inaccessible or underground power cables greater than or equal to 400 Volts (typically 480 V) within the scope of license renewal subjected to significant moisture
  - revised to include energized and de-energized cables
- *Detection of Aging Effects*
  - revised cable testing frequency not to exceed 6 years
  - revised inspection frequency of water collection is based on plant-specific operating experience, but not to exceed one year
  - event driven water accumulation inspections - such as rain or flood.

# ***AMP XI.E1, Insulation Material for Electrical Cables and Connections Not Subject to 10 CFR 50.49 EQ Requirements***

- *Program Description* clarified definition for “adverse localized environment,” and its identification
- Removed references to sampling - all accessible cables in adverse localized environments will be inspected
- Clarified definitions/terminology for consistency within AMP and with other electrical AMPs

# ***AMP XI.E2, Insulation Material for Electrical Cables and Connections Not Subject to 10 CFR 50.49 EQ Requirements Used in Instrumentation Circuits***

- *Program Description* consolidated including an updated “adverse localized environment” definition and discussion
- Clarified definitions/terminology for consistency within AMP and with other electrical AMPs

# ***AMP XI.E4, Metal Enclosed Bus***

- *Program Description and Scope of Program* revised to include MEB external surfaces and elastomers in AMP XI.E4 with an option to inspect under XI.S6 or XI.M38 as applicable
- *Parameters Monitored/Inspected and Detection of Aging Effects* revised for consistency within AMP and with GALL Chapter VI
- *Detection of Aging Effects* updated sampling criterion
- Clarified definitions/terminology for consistency within AMP and with other electrical AMPs

# ***AMP XI.E5, Fuse Holders***

- Revised the aging effect and aging mechanisms for consistency within AMP and with other electrical AMPs
- *Parameters Monitored/Inspected* and *Detection of Aging Effects* revised for consistency within AMP and with GALL Chapter VI
- *Operating Experience* revised to include NUREG -1760 operating experience

# ***AMP XI.E6, Electrical Cable Connections Not Subject to 10 CFR 50.49 EQ Requirements***

- Incorporated Final License Renewal Interim Staff Guidance LR-ISG-2007-02, which provides for one-time testing
- *Detection of Aging Effects* added sampling criteria
- Clarified definitions/terminology for consistency within AMP and with other electrical AMPs

# ***STRUCTURAL AMPs***

- Generic changes for Structural AMPs
  - Structural and high-strength structural bolting moved from Bolting Integrity Program into various structural AMPs
  - AMR line items for structural and high-strength structural bolting now managed by various structural AMPs



# ***AMP XI.S1, ASME Section XI, Subsection IWE***

- *Parameters Monitored, Monitoring and Trending, and Corrective Actions* revised AMP to incorporate interim staff guidance (LR-ISG-2006-01) related to monitoring the MK1 drywell corrosion
- *Detection of Aging Effects* revised to augment IWE requirement to include surface examination to detect cracking in SS penetration sleeves, dissimilar metal welds consistent with AMR line item of 2005 GALL Report

## **Associated AMR line items**

- New line added as a result of operating experience for torus shell exposed to air-indoor uncontrolled or treated water with loss of material due to corrosion

# ***XI.S2, ASME Section XI, Subsection IWL and XI.S3, ASME Section XI, Subsection IWF***

## **XI.S2**

- *Parameters Monitored* revised to include additional monitoring of tendons when containment cutout is needed to facilitate replacement of steam generator or reactor vessel head

## **XI.S3**

- *Parameters Monitored* clarified to address supports, sliding supports, spring and constant load supports and structural bolting
- *Detection of aging effects* clarified to include aging effects for structural bolting, sliding surfaces, elastomeric vibration isolator elements, and recommend volumetric examination to detect stress corrosion cracking in high strength bolts

# ***AMP XI.S4, 10 CFR 50, Appendix J***

- *Detection of Aging Effects* clarified that detection of aging would be achieved with the additional implementation of an acceptable containment inservice inspection program as described in ASME Section XI, Subsection IWE and ASME Section XI, Subsection IWL
- Updated the references to NEI 94-01 Rev 2-A (and associated EPRI Report).

## **Associated AMR line items**

- Revised to separate those components where AMP XI.S4 by itself is applicable (e.g. gaskets not in scope of XI.S1), and components where AMPs XI.S1 and XI.S4 are both applicable

## ***XI.S5, Masonry Walls***

- Clarified fire barrier masonry walls covered by Fire Protection
- Added inspection frequency of once every 5 years, or more frequently in areas where significant cracking is observed as defined in ACI-349-3R, edition 1996
- Clarified parameters monitored for cracking, separation, and shrinkage

### **Associated AMR line items**

- Added new AMR line for masonry walls exposed to air-outdoor

## ***XI.S6, Structures Monitoring***

- *Scope of Program* revised to:
  - clarify when the applicant has the option to include Masonry Walls and Water Control Structures within the scope of this program
  - include periodic groundwater chemistry (pH, chlorides, and sulfates)
- *Parameters Monitored* revised to clarify parameters to be monitored for concrete, steel, structural bolting, structural sealants, elastomeric vibration isolators, groundwater chemistry, and settlement monitoring
- *Detection of Aging Effects* revised recommended inspection frequency:
  - In-scope structures – stipulated in ACI-349-3R, edition 1996
  - Settlement monitoring – plant specific operating experience
  - Groundwater chemistry – not to exceed five years

# ***XI.S7, RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants***

- *Program Description* clarified that dam inspection is not in scope
- *Scope of Program* clarified to include sluice gates and trash racks
- *Detection of Aging Effects* added provisions to address aging effects based on groundwater chemistry

## **Associated AMR line items**

- Added new line for wooden piles in air-outdoor or water flowing or standing, or groundwater/soil

# ***XI.S8 Protective Coating Monitoring and Maintenance***

- Updated ASTM Standards
- Clarified importance of coating assessments for ECCS performance
- *Scope of Program* clarified to include coatings on concrete so that all coatings in containment are addressed
- Revised reference to RG 1.54, Revision 2
- New AMR line added in Chapters II and III for loss of coating integrity due to blistering, cracking, flaking, peeling, physical damage

# ***MECHANICAL AMPs***

- Added three new AMPs
  - Chapter XI.M16A, “PWR Vessel Internals”
  - Chapter XI.M40, “Monitoring of Neutron-Absorbing Materials Other than Boraflex”
  - Chapter XI.M41, “Buried and Underground Piping and Tanks”
- Deleted two AMPs due to lack of relevance
  - Chapter XI.M14, “Loose Part Monitoring”
  - Chapter XI.M15, “ Neutron Noise Monitoring”



# ***MECHANICAL AMPs***

- Eliminated three AMPs because they were subsumed by others
  - Chapter XI.M13, “Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel (CASS),” is subsumed by Chapter XI.M9, “BWR Vessel Internals” and the new Chapter XI.M16A, “PWR Vessel Internals”
  - Chapter XI.M28, “Buried Piping and Tanks Surveillance,” and Chapter XI.M34, “Buried Piping and Tanks Inspection,” are subsumed by the new Chapter XI.M41, “Buried and Underground Piping and Tanks”

- **Changes to various AMPs including:**
  - Chapter XI.M11B, “Cracking of Nickel-Alloy Components and Loss of Material Due to Boric Acid-Induced Corrosion in Reactor Coolant Pressure Boundary Components (PWRs Only)”
  - Chapter XI.M21A, “Closed Treated Water Systems”
  - Chapter XI.M31, “Reactor Vessel Surveillance”
  - Chapter XI.M35, “One-Time Inspection of ASME Code Class 1 Small-Bore Piping”
  - Chapter XI.M36, “External Surfaces Monitoring of Mechanical Components”
  - Chapter XI.M38, “Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components

# ***AMP XI.M41***

## ***Buried and Underground Piping and Tanks***

### **Objective**

- Manage aging of buried and underground piping and tanks
  - Primary issue is external corrosion

# ***AMP XI.M41***

## ***Buried and Underground Piping and Tanks***

### **Definitions**

- Buried
  - In direct contact with soil or concrete
- Underground
  - Below grade
  - Limited access
  - In contact with air
    - e.g. pipes in trenches or vaults

# ***AMP XI.M41***

## ***Buried and Underground Piping and Tanks***

### **Philosophy**

- Preventive actions are the best approach to aging management
  - Some inspections still required
  - More inspections required if prevention is less than perfect
- Concentrate efforts on high “risk” pipe
  - Higher probability of corrosion
  - Code Class or safety related
  - Hazmat
    - Radiation, diesel fuel etc.

# **AMP XI.M41**

## ***Buried and Underground Piping and Tanks***

### **Philosophy, contd.**

- Design preventive actions and inspections to prevent adverse effects
  - Code class/safety related
    - Must have sufficient water flow
  - Hazmat
    - Must not contaminate groundwater
- Excavations can damage pipe
  - Permit alternatives to excavations whenever possible
    - Hydrotests
    - Internal inspections
    - Monitor active equipment (jockey pumps)

# ***AMP XI.M41***

## ***Buried and Underground Piping and Tanks***

### **Preventative Actions**

- Applies to all piping except for fire mains
- Separate recommendations for
  - Buried piping and tanks
  - Underground piping and tanks
- Based on material of construction
- Recommendations concerning
  - Coating
  - Backfill
  - Cathodic protection

# AMP XI.M41

## Buried and Underground Piping and Tanks

### Preventative Actions, contd.

| Material <sup>1</sup>                   | Coating <sup>2</sup> | Cathodic Protection <sup>4</sup> | Backfill Quality  |
|---|----------------------|----------------------------------|-------------------|
| Titanium                                |                      |                                  |                   |
| Super Austenitic Stainless <sup>8</sup> |                      |                                  |                   |
| Stainless Steel                         | X <sup>3</sup>       |                                  | X <sup>5, 7</sup> |
| Steel                                   | X                    | X                                | X <sup>5</sup>    |
| Copper                                  | X                    | X                                | X <sup>5</sup>    |
| Aluminum                                | X                    | X                                | X <sup>5</sup>    |
| Cementitious or Concrete                | X <sup>3</sup>       |                                  | X <sup>5, 7</sup> |
| Polymer                                 |                      |                                  | X <sup>6</sup>    |



# ***AMP XI.M41***

## ***Buried and Underground Piping and Tanks***

### **Inspections**

- Categories considered
  - Buried pipe
  - Underground pipe
  - Buried tanks
  - Underground tanks
- Each category addressed separately
- Apply to
  - Code Class/safety related
  - Hazmat
- Expand to
  - All piping

# ***AMP XI.M41***

## ***Buried and Underground Piping and Tanks***

### **Inspections, contd.**

- Designed to accommodate
  - Poor prevention in first inspection (yrs 30-40)
- Expect
  - Good prevention in remaining inspections

# AMP XI.M41

## Buried and Underground Piping and Tanks

### Inspections, contd.

| Material <sup>1</sup>                   | Preventive Actions <sup>2</sup> | Inspections <sup>3</sup>               |                     |
|---|---------------------------------|--|---------------------|
|   |                                 | Code Class Safety Related <sup>4</sup> | Hazmat <sup>5</sup> |
| Titanium                                |                                 |  |                     |
| Super Austenitic Stainless <sup>7</sup> |                                 |  |                     |
| Stainless Steel                         |                                 | 1 <sup>6</sup>                         | 1 <sup>6</sup>      |
| HDPE <sup>8</sup>                       | A                               | 1 <sup>6</sup>                         | 1 <sup>6</sup>      |
|   | B                               | 2                                      | 1%                  |
| Other Polymer <sup>9</sup>              | A                               | 1 <sup>6</sup>                         | 1 <sup>6</sup>      |
|   | B                               | 2                                      | 1%                  |
| Cementitious or Concrete                |                                 | 1 <sup>6</sup>                         | 1 <sup>6</sup>      |
| Steel                                   | C                               | 1 <sup>6</sup>                         | 1 <sup>6</sup>      |
|   | D                               | 1                                      | 2%                  |
|   | E                               | 4                                      | 5%                  |
|   | F                               | 8                                      | 10%                 |
| Copper                                  | C                               | 1 <sup>6</sup>                         | 1 <sup>6</sup>      |
|   | D                               | 1                                      | 1%                  |
|   | E                               | 1                                      | 2%                  |
|   | F                               | 2                                      | 5%                  |
| Aluminum                                | C                               | 1 <sup>6</sup>                         | 1 <sup>6</sup>      |
|   | D                               | 1                                      | 2%                  |
|   | E                               | 1                                      | 5%                  |
|   | F                               | 2                                      | 10%                 |

# AMP XI.M41

## Buried and Underground Piping and Tanks

### Inspections, contd.

| Material <sup>1</sup> | Preventive Actions <sup>2</sup> | Inspections <sup>3</sup>               |                                   |
|-----------------------|---------------------------------|--|-----------------------------------|
|                       |                                 | Code Class Safety Related <sup>4</sup> | Hazmat <sup>5</sup>               |
| Steel                 | C<br>D<br>E<br>F                | 1 <sup>6</sup><br>1<br>4<br>8          | 1 <sup>6</sup><br>2%<br>5%<br>10% |

# ***AMP XI.M41***

## ***Buried and Underground Piping and Tanks***

### **Inspections, contd.**

- Alternatives
  - Fire mains
    - Flow tested at 1 year intervals
    - Monitor jockey pump activity
  - All pipe
    - Hydrostatic tests
    - Internal inspections

# ***AMP XI.M41***

## ***Buried and Underground Piping and Tanks***

### **Summary**

- Intent is to manage aging
  - Best accomplished through preventive actions
  - Necessary preventive actions depend on material and environment
- Intent is to be consistent with the way other high priority buried pipe is managed
  - Oil and gas pipelines
  - NACE SP0169-2007 critical component
- Concentrate on important piping
  - Code Class/safety related
  - Hazmat
  - Level of inspection differs

# ***AMP XI.M41***

## ***Buried and Underground Piping and Tanks***

### **Summary, contd.**

- Inspections necessary
  - Level depends on material and prevention
  - Good prevention by second inspection
  - Alternatives to visual inspections provided

# ***AMP XI.M16A, PWR Vessel Internals***

- AMP is based on guidelines for examination of vessel internals in EPRI report, “Materials Reliability Program (MRP): Pressurized Water Reactor Internals Inspection and Evaluation Guidelines (MRP-227-Rev. 0)” and “MRP: Inspection Standard for PWR Internals (MRP-228)”
- MRP-227-Rev.0 is currently being reviewed by the NRC staff



# ***AMP XI.M16A, PWR Vessel Internals - continued***

- MRP submitted proposed AMR line items for Westinghouse, Combustion Engineering, and Babcock and Wilcox designed vessel internals, based on MRP-227-Rev.0
- GALL 2005 did not contain a generic AMP for PWR vessel internals:
  - GALL 2005 recommended applicants to commit to participate, evaluate and implement an industry program for vessel internals and to provide an inspection plan no less than 24 months before entering the period of extended operation
  - GALL 2010 recommended applicants submit an inspection plan for vessel internals to the NRC for review and approval with the application for license renewal

# ***AMP XI.M16A, PWR Vessel Internals - continued***

- NRC staff modifications to the proposed MRP AMR line items:
  - Cracking to be managed by AMPs XI.M2, “Water Chemistry,” and XI.M16A, “PWR Vessel Internals”
  - All other aging effects to be managed by AMP XI.M16A, “PWR Vessel Internals”
  - Each component that is classified as a primary component, expansion component, or an existing program component in accordance with MRP-227-Rev.0 to be included in GALL
  - Cross reference primary and expansion component in accordance with MRP-227-Rev.0

# ***AMP XI.M16A, PWR Vessel Internals - continued***

- NRC staff modifications to the proposed MRP AMR line items (contd.):
  - All aging effects and components identified as primary, expansion, or existing program components in Table 3-1 through 3-3 of MRP-227-Rev.0 are identified as AMR line items in GALL – staff observed discrepancies between tables in section 3 and section 4 of MRP 227
  - Components that are identified as “no additional measures” components are not uniquely identified in the GALL tables
  - Core support structures will be examined in accordance with AMP Chapter XI.M1, “ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD”

# ***AMP XI.M16A, PWR Vessel Internals - continued***

- NRC staff modifications to the proposed MRP AMR line items (contd.):
  - Further evaluation of inaccessible locations if cross referenced accessible primary, expansion or existing program components have aging effects that need aging management
  - Further evaluation of Westinghouse guide tube support pins in control rod guide tube assemblies and Combustion Engineering lower incore instrumentation (ICI) thimble tubes
  - TLAA for further evaluation is identified for reduction in ductility and fracture toughness due to neutron irradiation for Babcock & Wilcox reactor vessel internals

# Chapter X.M1, “Fatigue Monitoring”

- Updated relative to background basis, assumptions, background information on how the program is applied, and basis for environmental fatigue calculations
- Update provides specific guidance for calculating environmentally-adjusted cumulative usage factor for carbon and low alloy steels, austenitic stainless steels, and nickel alloys
- Clarifies that scope includes locations identified in NUREG/CR-6260 as a minimum, and additional plant-specific component locations if they may be more limiting than those considered in NUREG/CR-6260
- Clarifies to provide a clear basis on how the tracking of the cycles (the preventive parameter) can be used to ensure the validity of current design basis CUF fatigue analysis values

# ***TLAAs - SRP-LR Section 4.3, “Metal Fatigue”***

- Clarified 10 CFR 54.21(c)(1)(i), (ii), and (iii) acceptance criteria and review procedure criteria for all Section 4.3 subsections
- Consolidated recommendations for implicit fatigue analyses that are applicable to ANSI B31.1 components and ASME Code Class 2 and 3 components designed to Section III requirements
- Added sections for SRP-LR review acceptance criteria and review procedures for metal fatigue TLAAs that may be applicable to BWR vessel internal components and for potential fatigue flaw growth analyses

# ***License Renewal Guidance Document Update: Summary***

- Involvement of NRC subject matter experts from multiple organizations
- Extensive interaction with, and incorporated comments from external stakeholders
- Changes made based on operating experience
- Incorporation of many lessons learned from license renewal applications and associated staff reviews
- Enhancements made to the GALL Report and SRP-LR that will improve their usefulness by staff and industry
- Guidance documents will provide appropriate framework for applicant's to develop programs that will continue to provide reasonable assurance to manage aging effects
- Requested waiver of CRGR review pending

# ***AMP XI.M35, One-time Inspection of ASME Code Class 1 Small Bore Piping***

- *Program Description:*
  - explicitly identify that socket welds are included
  - clarified program applicability to plants that have not experienced cracking or have effectively mitigated cracking from vibratory loading through design changes – otherwise a plant specific periodic inspection program is needed
- *Detection of Aging Effects:*
  - revised for socket welds to perform an opportunistic destructive examination as an alternative to volumetric examinations.
  - clarified for full penetration welds that only volumetric examination is recommended
  - clarified that volumetric examinations are performed using demonstrated techniques



# Consideration of Revision 2 Changes on Current Applications

- Using experienced personnel, public and industry comments, operating experience, and lessons learned over the past 5 years have resulted in improved information in the GALL Report Revision 2 aging management programs.
- The staff is reviewing the Revision 2 changes to identify significant issues that warrant review in the current in-house applications.
- Where applications do not have the information needed, the staff is asking Requests for Additional Information (RAIs).
- The staff will review the applicants' information, RAIs, and/or commitments to make reasonable assurance determinations that the effects of aging will be managed in the extended period.

