

**NUCLEAR REGULATORY COMMISSION**

**ORIGINAL**

Title: Advisory Committee on Reactor Safeguards  
Plant License Renewal Subcommittee

Docket Number: (not applicable)

PROCESS USING ADAMS  
TEMPLATE: ACRS/ACNW-005

Location: Rockville, Maryland

Date: Tuesday, March 27, 2001

Work Order No.: NRC-135

Pages 1-311

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

TRD4

**ACRS Office Copy - Retain  
for the Life of the Committee**

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 MEETING

9 + + + + +  
10 TUESDAY,  
11 MARCH 27, 2001

12 + + + + +  
13 ROCKVILLE, MARYLAND

14 + + + + +  
15  
16 The Subcommittee met at the Nuclear  
17 Regulatory Commission, Two White Flint North, Room  
18 T2B3, 11545 Rockville Pike, at 8:30 a.m., Dr. Mario  
19 V. Bonaca, Chairman, presiding.

20  
21 COMMITTEE MEMBERS PRESENT:

22 MARIO V. BONACA	Chairman
23 F. PETER FORD	Member
24 THOMAS S. KRESS	Member

## 1 COMMITTEE MEMBERS PRESENT: (cont'd)

2 GRAHAM M. LEITCH Member

3 WILLIAM J. SHACK Member

4 ROBERT E. UHRIG Member

5  
6 ACRS CONSULTANT PRESENT:

7 JOHN BARTON

8  
9 ACRS STAFF PRESENT:

10 SAM DURAISWAMY

11 ROBERT ELLIOTT

12  
13 ALSO PRESENT:

14 HANS ASHAR

15 RAJ AULUCK

16 GOUTAM BAGELU

17 R.D. BAKER

18 BILL BATEMAN

19 TAMMY BLOOME

20 JOSEPH BRAVERMAN

21 WILLIAM BURTON

22 GENE CARPENTER

23 ROBERT CARTER

24 T.Y. CHANG

25 PEI-YING CHEN

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 ALSO PRESENT: (cont'd)  
2 OMESH CHOPRA  
3 MANNY COMAR  
4 H.F. CONRAD  
5 J.F. COSTELLO  
6 AMY CUBBAGE  
7 JAMES DAVIS  
8 JERRY DOZIER  
9 ROBIN DYLE  
10 TANYA M. EATON  
11 BARRY ELLIOT  
12 JOHN FAIR  
13 DONALD FERRARO  
14 GREG GALLETTI  
15 HERMAN GRAVES  
16 CHRIS GRIMES  
17 JOHN HANNON  
18 ALLEN HISER  
19 CHUCK HSU  
20 DAVID C. JENG  
21 PETER J. KANG  
22 ANDREA KEIM  
23 ED KLEEH  
24 STEPHEN KOENICK  
25 W. KOO

**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 ALSO PRESENT: (cont'd)  
2 P.T. KUO  
3 SAM LEE  
4 W.C. LIU  
5 YUNG Y. LIU  
6 ROBERT LOFARO  
7 WAYNE LUNCEFORD  
8 JAMES E. LYONS  
9 MICHAEL McNEIL  
10 S.K. MITRA  
11 RICH MORANTE  
12 KEITH NICHMAN  
13 WALLACE NORRIS  
14 K. PARCZEWSKI  
15 ERACH PATEL  
16 PAT PATNAIK  
17 CHARLES R. PIERCE  
18 JAI RAJAN  
19 MUHAMMAD A. RAZZAQUE  
20 KIMBERLEY RICO  
21 K. RIW  
22 JOHN RYCYN  
23 SYED SHAUKAT  
24 PAUL SHEMANSKI  
25 DAVID SOLORIO

**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 ALSO PRESENT: (cont'd)

2 SHIU-WING TAM

3 BRIAN THOMAS

4 STEVEN G. TONEY

5 JIT VORA

6 DOUG WALTERS

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

**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)

## I N D E X

	<u>AGENDA ITEM</u>	<u>PAGE</u>
1		
2		
3	Opening Remarks . . . . .	7
4	Staff Opening Remarks . . . . .	8
5	Introduction and Review . . . . .	10
6	Overview of Public Comments . . . . .	14
7	Changes to Standard Review Plan: Scoping . . . .	15
8	and Screening Methodology	
9	Changes to Generic Aging Lessons Learned . . . .	36
10	(GALL) Report, Chapters II and III	
11	Changes to GALL, Chapter IV . . . . .	57
12	Changes to GALL, Chapters V, VII, and VIII . . .	76
13	Changes to Gall, Chapter VI . . . . .	105
14	One-time Inspections, Regulatory Guide, . . . .	111
15	NEI 95-10	
16	Changes to NEI 95-10: Industry Guidance . . . .	128
17	Staff Introduction Concerning BWRVIP . . . . .	169
18	Topical Reports Related to License Renewal	
19	BWRVIP 76: Core Shroud Inspection . . . . .	274
20	BWRVIP 41: Jet Pump Assembly Inspection . . . .	278
21	BWRVIP 26: Top Guide Inspection . . . . .	279
22	BWRVIP 75: Technical Basis for Revisions to . .	280
23	Generic Letter 88-01 Inspection Schedules	
24	Discussion . . . . .	299
25	Recess . . . . .	311

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealgross.com

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

(8:30 a.m.)

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

I am Mario Bonaca, Chairman of the subcommittee. The other ACRS members in attendance are Peter Ford, Thomas Kress, Graham Leitch, William Shack, and Robert Uhrig. We also have John Barton attending as a consultant.

The purpose of this meeting is to review the final drafts of the Standard Review Plan for License Renewal; the Generic Lessons Learned Report; the Draft Regulatory Guide DG 1104, Standard Format and Content for Applications to Renew Nuclear Powerplant Operating Licenses; and NEI 95-10, Revision 3, Industry Guideline for Implementing the Requirements of 10 CFR Part 54, the License Renewal Rule.

The subcommittee will also review selected reports of the boiling water reactor vessel and internal projects associated with the license renewal. The subcommittee will gather information, analyze relevant issues and facts, and formulate proposed position and actions as appropriate for

**NEAL R. GROSS**

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

(202) 234-4433

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

1 deliberation by the full committee.

2 Mr. Sam Duraiswamy is the cognizant ACRS  
3 staff engineer for this meeting. Mr. Rob Elliott,  
4 who is on rotation assignment to the ACRS staff from  
5 NRR, is also present.

6 The rules for participation in today's  
7 meeting have been announced as part of the notice of  
8 this meeting previously published in the Federal  
9 Register on March 8, 2001. A transcript of this  
10 meeting is being kept and will be made available as  
11 stated in the Federal Register notice.

12 It is requested that speakers first  
13 identify themselves and speak with sufficient  
14 clarity and so that they can be readily heard. We  
15 have received no written comments or requests for  
16 time to make oral statements from members of the  
17 public.

18 We will proceed with the meeting, and I  
19 call upon Mr. Grimes of NRR to begin. Good morning.

20 MR. GRIMES: Thank you, Dr. Bonaca.

21 My name is Chris Grimes. I'm the Chief  
22 of the License Renewal and Standardization Branch,  
23 and I want to thank the subcommittee for taking the  
24 time to review the results of the staff's effort to  
25 develop improved license renewal guidance.

**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 As you may recall, we set off to review  
2 license renewal applications for Calvert Cliffs and  
3 Oconee with draft guidance, an industry guide, and a  
4 standard review plan that were untested and  
5 represented a very different way of staff review for  
6 a licensing action.

7 We accomplished those first two reviews  
8 through perseverance and with a focus on the  
9 objective of Part 54. And through those efforts we  
10 learned substantial lessons in how to improve that  
11 focus and concentrate the staff review.

12 During the course of the review of the  
13 first two applications, the industry also raised an  
14 issue which they referred to as credit for existing  
15 programs. That is described in a Commission paper,  
16 SECY-99-148. As a result of that issue, and also a  
17 reflection on the lessons learned from the Calvert  
18 Cliffs and Oconee reviews, the staff set out to  
19 develop improved renewal guidance largely in the  
20 form of generic aging lessons learned, a catalog of  
21 the staff's expectations of the attributes of  
22 effective aging management programs.

23 We've kept the subcommittee and the  
24 committee informed of our efforts as we've gone  
25 through the evolution of trying to develop that

**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 catalog and the improved renewal guidance that goes  
2 along with it, with a focus on achieving  
3 predictability and stability in the license renewal  
4 reviews and to facilitate the future workload that  
5 we anticipate because of the substantial industry  
6 input and interest in license renewal for other  
7 power reactors.

8 Today's presentation is going to focus  
9 on addressing the way that the staff has responded  
10 to public comments on the improved renewal guidance,  
11 and I call upon Dr. Sam Lee, who is going to provide  
12 the introduction for the staff's presentation.

13 MR. LEE: Good morning. My name is Sam  
14 Lee of the License Renewal and Standardization  
15 Branch, NRR. And as Chris had indicated, the INPO  
16 license renewal guidance document consists of the  
17 Generic Aging Lessons Learned, the GALL Report,  
18 which is a staff evaluation of aging management  
19 programs, and the SRP, which references the GALL  
20 Report, to focus the staff in areas where programs  
21 should be thoroughly evaluated, and also consists of  
22 the Regulatory Guide which endorses NEI document 95-  
23 10 that provides guidance to the applicants to  
24 prepare their license reapplication.

25 There has been a significant agency

**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 effort. It involved the office of NRR and the staff  
2 who are conducting the license renewal applications,  
3 and also involved the Office of Research. And Jit  
4 Vora, on my right, he is the team leader from  
5 Research. And the two national labs -- Argonne  
6 National Lab, Yung Liu on my right, he is the  
7 Project Manager from Argonne. And Brookhaven  
8 National Lab, Mr. Morante on my left, he is the  
9 Project Manager from Brookhaven.

10 This morning we are going to discuss the  
11 changes or significant changes in the document as a  
12 result of public comment when we issued it in  
13 August. Back in August, the GALL Report has a  
14 format that is a double-sided, two-page table kind  
15 of format, and it turns out to be not very easy to  
16 use. So as a result we streamlined the format in  
17 the GAL Report into a one-page table format, and  
18 then we centralized the program evaluation into  
19 Chapter XI of the GALL Report.

20 We are going to discuss the GALL Report  
21 by structures and systems later on today. We are  
22 going to also discuss the associated changes in the  
23 program also.

24 The SRP references the GALL Report, so  
25 when the GALL -- when we make a change in the GALL

**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 Report, we make the corresponding or conforming  
2 changes in the SRP. However, in Chapter II of the  
3 SRP, we discuss the scoping. This is separate from  
4 the GALL Report. Okay? So Mr. S.K. Mitra will  
5 discuss the changes in the SRP relating to scope  
6 this morning.

7 And Dave Solorio is going to discuss the  
8 changes in the Regulatory Guide and NEI 95-10. And  
9 we were asked to discuss the one-time inspections,  
10 and Dave will also do that.

11 We are preparing a SECY paper to submit  
12 this document to the Commission for approval in  
13 April. And during the interaction with NEI to go  
14 over their comments on these documents, they  
15 identified five items that we should continue  
16 dialogue on. And we will discuss them later on this  
17 morning as they come up in the respective systems.

18 Another NEI comment is on the -- how  
19 these documents are going to be used. NEI is now  
20 performing a demonstration project which prepares  
21 some sample portions of an application, and they  
22 plan on submitting this to the staff by the end of  
23 April. And we will interact with industry to go  
24 through that document to see how we can work out the  
25 implementation details when all of these documents

**NEAL R. GROSS**

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

(202) 234-4433

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

1 get folded into the process.

2 CHAIRMAN BONACA: Before you move that,  
3 could you expand on the second bullet? I mean,  
4 continue dialogue on these five issues.

5 MR. LEE: Yes. We're going to talk  
6 about this later on in the later portion.

7 CHAIRMAN BONACA: Okay. All right.

8 MR. LEE: Okay? As they come up.

9 CHAIRMAN BONACA: Okay.

10 MR. LEE: Basically, this is -- continue  
11 to exchange information with NEI.

12 MR. GRIMES: Sam, if I may, this --  
13 those five items were issues that were -- that  
14 evolved from industry comments for which there was  
15 some controversy. And rather than take those issues  
16 to appeal, the industry requested that we -- that  
17 they be afforded an opportunity to continue a  
18 dialogue on those subjects, with an expectation that  
19 perhaps improved guidance or improved positions  
20 would be developed for future changes to the  
21 guidelines. And as we get to those topics and the  
22 particular sections that they apply, we will explain  
23 the details.

24 CHAIRMAN BONACA: Should complex  
25 assemblies be part of that list?

**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 MR. GRIMES: No. I believe that complex  
2 assemblies has been clarified. There may still be  
3 some details to work out, but that issue did not  
4 rise to a level of potential appeal.

5 CHAIRMAN BONACA: Yes. Because it seems  
6 there is some kind of significant issue in the Hatch  
7 application.

8 MR. GRIMES: And we expect that we'll be  
9 able to resolve that, but we are continuing to  
10 discuss treatment of complex assemblies on the Hatch  
11 application.

12 CHAIRMAN BONACA: Okay. Thank you.

13 MR. LEE: Okay. Is there any more  
14 questions? Okay. Now I'm going to turn it over to  
15 Mr. Steve Koenick to discuss the public comments.

16 MR. KOENICK: Good morning. I am Steve  
17 Koenick. To my right is Ed Kleeh. I'll give you a  
18 brief overview of the public comments.

19 We issued four documents, as Sam stated,  
20 on August 31st in Federal Register Notice 65  
21 FR53047. Following that, we had a public workshop  
22 with over 100 participants. We also received  
23 numerous comments on the improved regulatory  
24 guidance documents.

25 On the third bullet I reference NUREG-

**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 1739, which is the analysis of the public comments.  
2 We received over 1,000 comments, the bulk of which  
3 was from the nuclear industry, with the majority of  
4 those being from NEI.

5 With the written comments, you see 100  
6 -- over 100 individual comments. The majority of  
7 these comments were with respect to nuclear power as  
8 a whole and the license renewal process to which we  
9 responded to each comment with a description of the  
10 license renewal process. So that's how we  
11 dispositioned those comments. The rest are  
12 articulated in the NUREG, if you have any questions.

13 If none, why don't I turn it over to the  
14 SRP Chapter II on scoping.

15 MR. MITRA: Good morning. My name is  
16 S.K. Mitra, and with me from NRR on my left is Greg  
17 Galletti is -- he has contribution regarding scoping.  
18 And on my right is Brian Thomas, also from NRR, and  
19 he contributed on scoping and screening.

20 Today we'll discuss the changes in  
21 scoping, Chapter II, the standard review plan from  
22 the -- due to the industry comments. As Dr. Lee  
23 previously said, when the GALL changed, it resulted  
24 in a corresponding change in the SRP, and we will  
25 discuss later on as we talk about other GALL

**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 changes. But how that Chapter II of SRP addresses  
2 scoping which is separate from GALL, so in this  
3 slide we are only going to talk about SRPLR Chapter  
4 II, which is scoping.

5 The first bullet is we incorporated  
6 severe accident management to the source document to  
7 consider scoping. This is done in response to ACRS  
8 letter to Chairman dated November 15, 2000, to add  
9 severe accident management guidelines to SRPLR Table  
10 2.1-1, which is sample listing of potential  
11 information sources for identifying structure,  
12 system, and components within the scope of license  
13 renewal.

14 The number two bullet is clarify the  
15 focus of scoping review. We clarified in response  
16 to industry comments. The industry took an issue  
17 that we should -- that the industry should only,  
18 under Rule 5421, request to identify the list of SSC  
19 data subject to aging management review, not a list  
20 within the scope of license renewal.

21 Previously, the previous application,  
22 the industry submitted a list of components that are  
23 within the scope of license renewal. So the change  
24 in the SRPLR will be from -- in the future, the  
25 industry is only going to submit the list which are

**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 in AMR, which is, you know, aging management review.

2 And the other list will be determined  
3 through the sample in PNID, review of FSAR, and  
4 other plan documents, what SSC are, you know, within  
5 the scope. And during the inspection, the plant --  
6 the list will be available for the inspectors.

7 CHAIRMAN BONACA: Well, let me ask a  
8 question. I'm trying to understand if I understood.  
9 So the industry wants to have only the results of  
10 the scoping and screening listed in the application?

11 MR. THOMAS: Yes. If I understand the  
12 industry's comments appropriately, they --  
13 basically, they're saying that the SRP should focus  
14 on the actual expected contents of the application.  
15 And when you look at the rule, it specifically  
16 states that it should just be the structures that  
17 are subject to AMR.

18 CHAIRMAN BONACA: Yes. I understand  
19 that. I mean, the way we have seen it, there was a  
20 scoping process that said this is -- potentially it  
21 should be in the application.

22 MR. THOMAS: Right.

23 CHAIRMAN BONACA: I mean, should be  
24 under the aging management programs. Then you have  
25 a screening process that will cut out a number of

**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 those, because they do not perform the function that  
2 -- the result of it is a list of components which  
3 will be subject to an aging management program.

4 MR. THOMAS: Right.

5 CHAIRMAN BONACA: That's what they want  
6 to have in the application?

7 MR. THOMAS: In the application itself,  
8 yes.

9 CHAIRMAN BONACA: How do you -- how does  
10 a reviewer understand the process by which the  
11 screening has been applied if you don't know what  
12 the list they started from is?

13 MR. THOMAS: Well --

14 CHAIRMAN BONACA: I'm trying to  
15 understand, you know, how you do that. I mean, the  
16 review process is a very important one. I'm saying  
17 this because even the ACRS struggles with the  
18 review, and we are -- you know, since scoping is  
19 important, and how you go through the steps is  
20 important.

21 MR. THOMAS: Right. There is a review  
22 of the scoping methodology itself that is performed.  
23 And then the review of the application itself is  
24 just focused on the results of that -- of the  
25 implementation of that scoping methodology, which

**NEAL R. GROSS**

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

(202) 234-4433

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

1 is, you know, a subordinate list of structures and  
2 components that are subject -- yes, that list is  
3 subordinate to the bigger picture list.

4 What a reviewer essentially has to do is  
5 what we consider to be a negative review if you  
6 will, and what you're looking for is really what's  
7 been omitted from the scope of structures and  
8 components subject to AMR. What a reviewer then has  
9 to do is just canvass the PNIDs, the FSAR, any other  
10 plant supporting documents, the licensing basis, and  
11 so forth, to determine if there are any additional  
12 items that should have not been omitted from that  
13 list that presents the results of the screening, the  
14 scoping and screening.

15 CHAIRMAN BONACA: But it seems to me  
16 that this places all of the burden on the staff. I  
17 mean, I have a concern with that, and I would like  
18 to express it now, because I've seen it also in the  
19 Hatch application that we are talking about  
20 tomorrow. If the staff has to ask questions, many,  
21 you know, requests for additional information  
22 saying, "Why didn't you include in scope the  
23 following 27 components?" and then the answer comes  
24 and says, "Oh, of those, 20 are in scope, but you  
25 have to look at them some other way."

**NEAL R. GROSS**

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

1                   And so you keep asking questions, and  
2                   you keep having some confirmation or some exceptions  
3                   and expirations. At the end, you are making a  
4                   statement in the SER that you have -- you have  
5                   reasonable confidence that all components that  
6                   should be in scope are in scope.

7                   How are you making that statement? I  
8                   mean, you have to do a lot of pulling strings to --  
9                   you know, I mean, the process it seems to me becomes  
10                  some difficult for a reviewer that I'm just  
11                  questioning how you're going to be able to make a  
12                  statement that says there is reasonable confidence  
13                  that all issues in scope are in scope.

14                  MR. THOMAS: It is a very involved  
15                  review process, and it's very involved review on the  
16                  part of the reviewer. But it forces the reviewer  
17                  to, you know, do a thorough evaluation of the  
18                  systems and structures and components, and to do  
19                  just that, what you said, to prod and probe to see  
20                  if there has been any omissions from the screening  
21                  results.

22                  MR. GALLETI: Excuse me. This is Greg  
23                  Galleti. I'm with the IQPB part of NRR. We're  
24                  responsible for the scoping methodology review. The  
25                  staff would have two opportunities to review the

**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 scoping methodology in detail.

2 One would be during the scoping audit  
3 which is performed by the staff reasonably early on  
4 in the process. We would be on-site at the  
5 engineering offices looking at the design  
6 documentation and going through with the cognizant  
7 engineers the specifics of the scoping review,  
8 scoping methodology, and looking at the scoping  
9 results.

10 In addition, there's a second  
11 opportunity for the staff to go through in detail  
12 and look at the scoping results, and that would be  
13 during the scoping inspection which is performed by  
14 the regional offices. They would go out and do a  
15 more formal review of the results, system walkdown,  
16 things of that nature, to determine if in fact the  
17 scoping was accomplished in accordance with the  
18 methodology put forth.

19 CHAIRMAN BONACA: I understand that. It  
20 doesn't change the -- yes, sorry.

21 MEMBER SHACK: Yes. You know, it seems  
22 to me, and I guess we've argued around here, that it  
23 would certainly be helpful to the reviewer to have  
24 these results. What is the major -- is it really  
25 just the burden on the licensee to provide this

**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 list? He's got the list.

2 CHAIRMAN BONACA: He's got the list,  
3 hopefully. I think I started from somewhere, and --

4 MR. GALLETI: The list would be  
5 available to us during the audits. Obviously, the  
6 list has been developed by the licensee as part of  
7 their methodology. When we go out to do the audit,  
8 that level of detail would be available to us, and  
9 we would exercise reviewing that information.

10 MR. GRIMES: This is Chris Grimes. I'd  
11 like to clarify that we can reflect back that it was  
12 the focus of the renewal rule that established that  
13 the application need only provide the results of the  
14 process, and the rule focuses on a process-oriented  
15 screening -- scoping and screening activity for  
16 which the application is specifically told to only  
17 produce the result.

18 The guidance that we have provided in  
19 the SRP explains to the staff how to go about  
20 testing the results of the process. And,  
21 admittedly, it forces the staff to stop and think  
22 about the insights gained from, in this particular  
23 case, severe accident management guidelines, but  
24 also the FSAR and other source materials for which  
25 the staff then applies its experience and knowledge

**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 in order to go through a process of testing those  
2 results in order to determine whether or not the  
3 staff can identify any structures, systems, or  
4 components that have been omitted. And that's the  
5 way that we have constructed the guidance, is to  
6 explain to the staff how to go about doing that.

7 As Greg pointed out, during the  
8 methodology review and the scoping inspection, the  
9 staff has an opportunity to look at the underlying  
10 documentation that includes things that were  
11 originally considered and then excluded for whatever  
12 reason. And our safety evaluations have explained  
13 what we found, how we've tested, and how we reach a  
14 conclusion that is framed in terms of the staff  
15 hasn't found anything omitted, and, therefore, there  
16 is reasonable assurance that the result is complete.

17 And we certainly could consider a new  
18 construct for the rule that would present the front-  
19 end of the process, but that would tend to detract  
20 from the process orientation of the rule.

21 CHAIRMAN BONACA: Yes. I'd like to note  
22 that the rule -- it's written in a few pages, and  
23 the guidance is written in hundreds and thousands of  
24 pages. And I'm saying there is quite a latitude in  
25 support and documentation to help the processes

**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 which are implied in the application of the rule, .  
2 which is the development of the application, the  
3 review, the SCR, and everything else.

4 So I -- I can't argue now -- and you  
5 may, in fact, have available during your inspection  
6 a full listing and very scrutable. I'm only saying  
7 that it doesn't facilitate, for example, for a  
8 reviewer like myself. I spent time looking at the  
9 Hatch application, and I really was troubled by the  
10 fact that it was hard to pull strings to find how it  
11 went from A to B to C. And I think that documents  
12 should be more scrutable than that. Anyway, that's  
13 my comment here.

14 MEMBER LEITCH: Wait a minute. I had a  
15 question on the first bullet, if you were getting  
16 ready to move forward. As I understand it, all that  
17 was done as a result of the ACRS comment was that  
18 you added severe accident management guidelines to  
19 Table 2.1.1. That table says sample listing of  
20 potential information sources.

21 So there's a suggestion that one might  
22 look at severe accident management guidelines. It  
23 leaves me with a question about whether that's  
24 really required or not. In other words, if there is  
25 equipment that is necessary to carry out actions

**NEAL R. GROSS**

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

(202) 234-4433

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

1 prescribed in the severe accident management  
2 guidelines, is that equipment required to be in the  
3 scope?

4 MR. GALLETI: If I could answer that.  
5 This is Greg Galleti again. What is required is  
6 that the application be consistent with the current  
7 licensing basis. To that extent, if there is --  
8 when you review the severe accident management  
9 guideline, if there is equipment in that --  
10 described in that guideline that would be consistent  
11 with the COB, then one would consider that to be  
12 potentially within the scope.

13 Just because something is in the severe  
14 accident guideline does not necessarily mean that it  
15 must be within the scope of for license renewal.  
16 But, generally, what we have done is we've put, you  
17 know, a rather large listing of potential documents  
18 that would be available to the staff to review  
19 really in preparation for embarking on the scoping  
20 evaluation.

21 The mandate of the staff is to come up  
22 with a safety determination, based on getting a good  
23 understanding of what the current licensing basis  
24 is. That's a formidable task, and the staff felt it  
25 was appropriate to try to encompass as many

**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 technical documents that pertain to the licensee and  
2 the design of the plant as possible. That's really  
3 the general reason why we felt it was appropriate to  
4 incorporate it there.

5 MEMBER LEITCH: But doesn't it -- the  
6 severe accident management guidelines are not in the  
7 current licensing basis, are they?

8 MR. GALLETT: That's correct.

9 MEMBER LEITCH: So it seems to me it  
10 still begs the question as to whether we're -- what  
11 is our expectation with regard to severe accident  
12 management guidelines.

13 MR. GALLETT: I think what we've tried  
14 to do is provide the staff with an opportunity  
15 certainly to look at that information to try to  
16 glean some insights as to what would be risk  
17 significant or important SSCs for the purposes of  
18 this plant -- you know, any particular plant.

19 I think what we've determined is that  
20 the efficacy of the SAM guidelines is really going  
21 to be considered on a site-specific, case-by-case  
22 basis. Again, that's why we had incorporated into  
23 that level of this SRP.

24 MEMBER LEITCH: And, again, the only  
25 change that was made as a result of that was just

**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 the added listing in this table. There's nothing in  
2 the text that refers to that?

3 MR. GALLETI: I believe that's true.

4 MEMBER LEITCH: Okay. Thank you.

5 MR. MITRA: The last bullet we have --  
6 item which we are having continued dialogue with  
7 NEI. And it's IPE/IPEEE has a source document to  
8 consider for scoping. Since license renewal rule is  
9 deterministic, not probabilistic, the industry  
10 commented that PRA techniques have very limited use  
11 for license renewal scoping.

12 There is one element -- the review of  
13 individual plant examination, which is IPE, and  
14 individual plant examination of external event,  
15 which is IPEEE, in the SRP. The staff agrees that  
16 license renewal rule is deterministic, but also  
17 feels that the use of IPE and IPEEE does provide  
18 useful insight for current licensing basis.

19 The dialogue with the industry is still  
20 going on, and hopefully we will have some kind of a  
21 resolution on this.

22 MR. GRIMES: This is Chris Grimes. I'd  
23 like to expand on that thought in further response  
24 to Dr. Leitch's question. The standard review plan  
25 generally explains to the viewers your source

**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 material as part of this challenge to the results of  
2 scoping and screening, and particularly in the area  
3 of the use of severe accident management guidelines  
4 and IPEs.

5 The staff has very powerful tools to go  
6 -- to prod into the current licensing basis and to  
7 determine the extent to which there may be systems,  
8 structures, and components that are important to  
9 safety that may not be part of the current licensing  
10 basis.

11 And I believe that it's reasonable to  
12 characterize the industry's concern as further  
13 guidance in the standard review plan in terms of how  
14 to use those devices without causing damage, and  
15 that is to unnecessarily challenge the current  
16 licensing basis to be more risk-informed without an  
17 explanation of the process by which risk-informed  
18 changes to the licensing basis should be made.

19 I believe that the guidance is  
20 reasonable, in terms of the importance of the focus  
21 on maintaining a current licensing basis and simply  
22 selecting from that those systems, structures, and  
23 components that need to be considered for aging  
24 management reviews.

25 But I do also see an opportunity for us

**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 to draw experience from risk-informed licensing to  
2 further expound the explanation about how to use  
3 risk insights in a constructive way. And that's why  
4 we'll continue a dialogue in this particular area  
5 that may result in additional guidance to the  
6 reviewers in the future and how to challenge the  
7 current licensing basis in a constructive way.

8 MR. MITRA: That's all we have on  
9 scoping.

10 MR. BARTON: Is there going to be any  
11 more discussion on the standard review plan in  
12 today's presentation, or is this it?

13 MR. MITRA: Well, as I said before, that  
14 any changes in GALL have an effect on SRPLR, and we  
15 will discuss along -- the changes with GALL in the  
16 later part of the presentation.

17 CHAIRMAN BONACA: Any other questions  
18 for --

19 MR. BARTON: Yes. Mario, I've got a  
20 question, and I don't know if it's timely or  
21 whatever. Section 1 of the SRP, paragraph 1.1.3.2,  
22 it talks about timeliness of the application and  
23 says the licensee must submit an application at  
24 least five years before the license expires. I  
25 don't know whether this paragraph is a "gotcha" from

**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 a licensee and decides late in life that I'm going  
2 to now extend my license, want to extend my license.

3 And I'm in my fifth year before  
4 expiration, and I submit an application which the  
5 reviewers decide is not "a sufficient application,"  
6 and I have to modify it. It says I have to submit  
7 the modified application with at least five years.

8 I just wonder whether if you're late in  
9 submitting it and you have to modify it, whether you  
10 can still meet the requirements of the standard  
11 review plan, because the next section says if I  
12 don't do this, the reviewer checks off, "No, I have  
13 not satisfied this requirement," and I get a letter  
14 from the NRC that says my license will expire in  
15 five years. End of story.

16 And I just wonder whether that's what  
17 this thing really gets you -- is it a real "gotcha"  
18 or is there a way out of this thing? That's the way  
19 I read this.

20 MR. GRIMES: I'll respond to that  
21 question. The provisions for timeliness are  
22 established by the rule, the guidelines, for the --  
23 to the staff are simply the guidelines on how to  
24 treat the timeliness requirements in the rule.  
25 We've had several requests -- at least a couple of

**NEAL R. GROSS**

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

1 requests to take exception to the other end of the  
2 time scale, and that is not sooner than 20 years  
3 prior to expiration.

4 And it really gets to the Administrative  
5 Procedures Act in terms of the timeliness for the  
6 proceedings to occur, which were originally  
7 predicated on an expectation that it would take five  
8 years to complete a review.

9 I would expect that if an applicant were  
10 to determine late in life that they still want to  
11 apply for license renewal, and they come in with  
12 less than five years to go, that they would be able  
13 to make a case for taking exception to that  
14 requirement, and then the staff would be given  
15 specific guidance on how to treat those specific  
16 cases.

17 But this statute wasn't intended for the  
18 staff to be backed into a corner on making the  
19 timeliness decision. It's an administrative  
20 requirement for the process.

21 MR. BARTON: Thank you, Chris.

22 MEMBER LEITCH: I guess I had a couple  
23 of technical questions in the standard review plan.  
24 I'm a little unclear how we're going to proceed  
25 today. Is this the appropriate time to ask those

**NEAL R. GROSS**

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

1 questions? Or could they be discussed when we talk  
2 about GALL? You're just talking about a few changes  
3 that have been made to the standard review plan?

4 MR. GALLETT: Well, to the specific  
5 section of the SRP. If your question relates to  
6 that particular section, I guess we can discuss it  
7 right now.

8 MEMBER LEITCH: No, it does not. Okay.

9 MR. LEE: Are your questions relating to  
10 Chapter III of the SRP? This is Sam Lee from NRR.

11 MEMBER LEITCH: No. They're mainly  
12 Chapter IV, actually.

13 MR. LEE: Chapter IV? And those -- yes,  
14 what are the questions? Maybe he can help the, you  
15 know, panel, you know, answer that for you when they  
16 come up.

17 MR. BARTON: If you want to talk about  
18 Chapter III, the comment I've got on Chapter III is  
19 there seems to be a lot of repetition in subsections  
20 of Chapter III. And I don't know what your plan is  
21 with this document to go back and do some more  
22 editing, or if this is the final shot, or whatever,  
23 but I think you could significantly improve this  
24 document just by looking at Section 3.2 and some of  
25 the subsections -- 3.2.2.2 and 3.2.3.2 as an

**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 example.

2 There is so much repetition I think that  
3 you could kind of take out 90 percent of the  
4 repetition here and still get your point across.

5 And the same problem occurs in the power  
6 steam and power conversion in Section 3.4. If  
7 you'll look at those sections, I think you can  
8 significantly improve this document by a good  
9 editing job.

10 MR. GRIMES: Our editors are going to be  
11 sorely disappointed.

12 CHAIRMAN BONACA: I had just a couple of  
13 questions, too, about Section 3. There are a number  
14 of -- for example, under auxiliary systems, there  
15 are some sections where the section is still there  
16 but at the beginning of it there is a parenthesis  
17 that says, "Program no longer used." And I don't  
18 understand, what does it mean? I mean --

19 MR. BARTON: 3.3.2.2.6 and 3.3.2.2.8 are  
20 examples of --

21 CHAIRMAN BONACA: Are examples of --

22 MR. BARTON: -- our program you say  
23 "Program is not used."

24 CHAIRMAN BONACA: Yes.

25 MR. BARTON: Kind of confusing.

**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 MR. LEE: I guess when we come to the  
2 auxiliary system, the panel can explain to us.

3 CHAIRMAN BONACA: Also, before that, in  
4 a number of other sections, like 3.2.2.2.2 on the  
5 crack initiation and growth due to stress corrosion  
6 cracking, that was in the old document. It's not  
7 there anymore. There are many examples of certain  
8 issues under certain sections that have been totally  
9 eliminated. I'm sure there is a logic behind that.

10 I would like to understand how you  
11 restructure that eliminated those sections from the  
12 previous draft. In some cases, I mean, I thought  
13 the issue was still there. But I guess the  
14 discussion is gone, so either it has been absorbed  
15 somewhere else and I don't understand where, or it  
16 doesn't belong there and I don't understand why.

17 So if you will talk to me about that.

18 MR. LEE: Yes, we'll talk about that  
19 later.

20 MR. MITRA: Any other questions on  
21 Chapter II SRP? If not, we'll leave the floor for  
22 Mr. Peter Kang for Chapter II and Chapter III  
23 structure.

24 CHAIRMAN BONACA: As we get ready for  
25 this presentation, there was one more question

**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 regarding the SRP. It would be probably good to  
2 provide it now in case you want to look for an  
3 answer from NRR.

4 MEMBER LEITCH: It was regarding  
5 Chapter IV, actually. I wasn't sure if we were  
6 coming back to that or not. 4.2.3 related to the  
7 elimination of circumferential weld inspections for  
8 boiling water reactors, and I was just wondering why  
9 we were doing that. Is it very difficult or  
10 impossible to inspect circumferential welds?

11 It seems like what we're doing here is  
12 saying, well, we've made an analysis and they're  
13 good for 64 effective full power years. And we're  
14 going to improve operator training so that we don't  
15 have any of these low temperature overpressurization  
16 events.

17 But my question still remains, why not  
18 just look at the welds?

19 MR. LEE: We'll discuss that later.

20 MEMBER LEITCH: Okay.

21 MR. LEE: In Chapter IV of the GALL  
22 Report.

23 MEMBER LEITCH: That will come up later?  
24 Okay.

25 MR. LEE: We will do that.

1 MEMBER LEITCH: Thanks. Okay.

2 MR. KANG: We are ready to talk to GALL  
3 Chapters II and III.

4 My name is Peter Kang, K-A-N-G, with the  
5 License Renewal, and --

6 MR. DAVIS: Jim Davis from Materials and  
7 Chemical Engineering.

8 MR. COSTELLO: Jim Costello from Office  
9 of Research.

10 MR. BRAVERMAN: Joe Braverman,  
11 Brookhaven National Lab.

12 MR. ASHAR: Hans Ashar, Mechanical and  
13 Civil Engineering Branch.

14 MR. MORANTE: Rich Morante, from  
15 Brookhaven National Lab.

16 MR. KANG: Okay. For Chapter II, which  
17 is containment structures, and Chapter III,  
18 structure and the component supports, So those two  
19 areas -- chapters we had in -- although there was a  
20 lot of changes, comments on that, but this is the  
21 most -- four most important issues.

22 The first has been dealt with before.  
23 The first bullet is dealing with managing aging  
24 effects of concrete and steel for inaccessible  
25 areas. In the August version of GALL we required

**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 evaluate the plant-specific programs whenever for  
2 any inaccessible areas. When the conditions in  
3 accessible area may not indicate, then it presents  
4 degradation to some inaccessible area.

5 Since the industry commented that such a  
6 requirement is over and above 10 CFR 50.55A, which  
7 states, "Licensees shall evaluate the acceptability  
8 of an inaccessible area when conditions exist in an  
9 accessible area that could clearly indicate the  
10 presence of degradation to such inaccessible areas."

11 So our position was a very stringent,  
12 which is -- obviously, was that you've got to have a  
13 plant-specific whenever you have an inaccessible  
14 area. So staff decided to clarify this aging  
15 management of an inaccessible area.

16 The latest GALL has revised it to  
17 include specific criteria for, let's say, aging  
18 effects of concrete due to aggressive impact or  
19 corrosion of embedded steel. The applicants should  
20 establish periodic monitoring of below-grade water  
21 chemistry and evaluate whether the below-grade  
22 environment is found to be aggressive.

23 But then we have a definition of -- or  
24 criteria for aggressiveness -- is based on NUREG-  
25 1611, which is for pH levels and chloride levels and

**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 sulfate. And then --

2 MEMBER LEITCH: Could you point us to a  
3 specific page on GALL? Do you have that  
4 information?

5 MR. KANG: Yes. The latest or the  
6 August versions?

7 MEMBER LEITCH: This is the March 2001  
8 version.

9 MR. KANG: Oh, the 2001. 2000 is the  
10 August version.

11 MEMBER LEITCH: No, the latest one.

12 MR. KANG: Oh, okay. The latest one.  
13 Okay.

14 This is first -- okay. PWR is in the  
15 front sections, and BWR is in the back. And the PWR  
16 Section 2, Chapter 2A, 1-3, has -- let's see here,  
17 this is -- okay. Aggressive chemical is actually 1-  
18 4.

19 MEMBER LEITCH: Okay.

20 MR. KANG: Aggressive chemicals and --  
21 okay. That's for one. And then, four, aging  
22 effects on concrete due to leaching of calcium  
23 hydroxide, this is on A-1-3, the first items on the  
24 bottom, identified as A.1.1-B. That one the  
25 applicant has to establish the leaching is not

**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 significant by evaluating whether the concrete is  
2 exposed to the flowing water.

3 Even then, you also have the conflict as  
4 to whether -- evaluate whether a conflict is  
5 constructed based on ACR 201.2.R. This is to ensure  
6 the conflict is dense and well-cured and has low  
7 permeabilities.

8 And then the last one is steel. For  
9 aging effects of steel area of containment due to  
10 corrosion, the concern was this is water on the  
11 containment floor, seeping through cracks in the  
12 concrete floor, or past degraded joint sealants.

13 So to determine whether loss of material  
14 due to corrosion is significant the applicant  
15 establishes -- there was a list of four items,  
16 whether they -- their concrete meets the requirement  
17 of ACI, and the monitoring of concrete for  
18 penetrating cracks, and also moisture barrier. Is  
19 it constructed or built in accordance with IWE  
20 requirements? And then, also develop a program to  
21 minimize water spillage.

22 Then, so what we said was if any of  
23 those criteria cannot satisfy, then a plant-specific  
24 management program has to be developed to address  
25 each of those items.

**NEAL R. GROSS**

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

(202) 234-4433

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

1 MEMBER LEITCH: So conversely, then, if  
2 all those criteria are satisfied, then no further  
3 action is -- no further evaluation is required.

4 MR. KANG: Yes, that's correct. Yes.

5 MEMBER LEITCH: thank you.

6 MR. KANG: Second bullet. This is on  
7 managing loss of material due to corrosion of  
8 containment of steel elements. In our August  
9 version of GALL, the report described -- what we  
10 said was IWE, with Appendix J and the coating  
11 program -- in other words, you've got to have all  
12 three components together. But industry commented  
13 that Appendix J and the coating should be deleted,  
14 because IWE alone should be -- is acceptable as a  
15 stand-alone program.

16 MR. BARTON: Excuse me. "IWE" meaning  
17 -- what's IWE?

18 CHAIRMAN BONACA: What does it stand  
19 for?

20 MR. KANG: IWE relates to the in-service  
21 inspection of metallic liners and --

22 AUDIENCE MEMBER: The code.

23 MR. BARTON: Oh, the code? Okay. All  
24 right. Gotcha. Okay.

25 MR. KANG: So then staff did that -- we

**NEAL R. GROSS**

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

1 had a lot of discussions back and forth, especially  
2 pertinent to Appendix J. And the staff could not --  
3 we did not agree to deleting Appendix J and coating  
4 program. However, in the past, the staff has  
5 granted the relief request for a few certain plants  
6 on IWE inspection, on the maintenance of the  
7 protective coating to control corrosion.

8 So on that basis, the final version has  
9 slightly revised on the coating program. We just  
10 added a statement which says the coating program is  
11 -- if the coating program is credit for the  
12 managing loss of material due to corrosion during  
13 current licensing terms, then you should continue  
14 on.

15 So that's a slight difference on this  
16 managing loss of material due to corrosion on the  
17 containment steel elements.

18 MR. BARTON: Does this take care of  
19 corrosion of containment on the exterior of the  
20 steel as well?

21 MR. DAVIS: No. No, it doesn't. It  
22 only applies to inside.

23 MR. BARTON: How do you handle exterior  
24 corrosion?

25 MR. DAVIS: I'm not aware of it being a

**NEAL R. GROSS**

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

1 problem, but it --

2 MR. BARTON: How about Oyster Creek's  
3 drywall?

4 MR. DAVIS: Except Oyster Creek. And  
5 it's not covered by the code.

6 MR. MORANTE: This is Rich Morante from  
7 Brookhaven. The basic in-service inspection  
8 requirements of IWE would include inspections of the  
9 exterior surface of a steel containment.

10 MR. KANG: Accessible.

11 MR. MORANTE: Of the accessible areas of  
12 a steel containment.

13 MR. BARTON: Accessible areas.

14 MR. KANG: Accessible areas.

15 MR. MORANTE: Except that IWE, through  
16 10 CFR 50.55A, which invokes IWE, does require an  
17 evaluation of inaccessible areas if there is  
18 suspicion that there may be degradation there based  
19 on what is seen in an accessible area.

20 The sand pocket region would fall into  
21 one of those areas that would have to be  
22 specifically reviewed by an applicant, and it is  
23 identified in the GALL tables as an area for review  
24 during license renewal.

25 MR. BARTON: Thank you.

**NEAL R. GROSS**

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

1 MR. KANG: Okay. Third bullet. The  
2 third bullet is for managing stress corrosion  
3 cracking and the crevice corrosion for the stainless  
4 steel.

5 MEMBER SHACK: Can we just back up for  
6 just a second?

7 MR. KANG: Yes, okay.

8 MEMBER SHACK: Go through that coatings  
9 program once more. So if they have the coatings  
10 program -- only if they're taking credit for it -- I  
11 mean, that's the thing. A lot of the time -- I see  
12 that in other sections, that they may have the  
13 program but it's only sort of required if they are  
14 asking credit for it. They may try to continue the  
15 program, but if they can live without the credit  
16 then they don't want to sort of commit themselves to  
17 the program, is sort of what I see happening here.  
18 Is that the basic idea?

19 MR. DAVIS: A number of utilities have  
20 come in and asked for relief from the code  
21 requirements of IWE to use our coatings program  
22 because it's a more intense program. And so they're  
23 doing it in relief of the code requirements.

24 MEMBER SHACK: Requirements. Oh, okay.  
25 So you don't want to have both.

**NEAL R. GROSS**

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

1 MR. MORANTE: Well, let's say we're not  
2 required to --

3 MEMBER SHACK: Required to have both.

4 MR. DAVIS: A lot of them do both,  
5 actually.

6 MEMBER SHACK: Right. Yes. But  
7 required to only --

8 MR. ASHAR: But the earlier applications  
9 like Calvert Cliffs, Oconee, and Hatch that I'm  
10 reviewing now, they all have credited coating  
11 program for corrosion. So far we have seen that.

12 MR. DAVIS: That's only in containment,  
13 though, not in the coatings program outside of  
14 containment.

15 MR. ASHAR: Yes.

16 MR. KANG: All right. The third bullet  
17 -- this is for managing stress corrosion cracking  
18 and the crevice corrosion for stainless steel spent  
19 fuel pool liner issues. Industry commented that  
20 deleting monitoring of a leakage detection system  
21 that was discussed in August version, we had a leak  
22 chase monitoring of leak chase system drain lines  
23 and leak detection sump.

24 They commented that it should be  
25 replaced with just a water chemistry program as

**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 applicable, aging management program. Their  
2 justification was the water chemistry program  
3 precludes aging effects by maintaining spent fuel  
4 parameters so that the degradation would not occur.

5 Staff has agreed or concurred that the  
6 water chemistry program could be identified as  
7 applicable aging management program. And then also,  
8 in addition to water chemistry program, staff took  
9 the position reliance solely on controlled water  
10 chemistry does not manage potential degradation from  
11 concrete side of a spent fuel pool liner -- the  
12 other side of a concrete.

13 So because -- and this is because we --  
14 such degradation we have seen at the one plant. So  
15 -- so and the latest GALL uses -- revised this one  
16 and said uses both a combination of the water  
17 chemistry program and the monitoring of pool water  
18 level to manage the corrosion of a stainless steel  
19 fuel pool liner.

20 MEMBER LEITCH: So you're talking about  
21 monitoring the pool water level --

22 MR. KANG: Yes.

23 MEMBER LEITCH: -- rather than tell-  
24 tales?

25 MR. KANG: Well --

1 MEMBER LEITCH: I mean, it would have to  
2 be a pretty gross leakage --

3 MR. KANG: Right. We --

4 MEMBER LEITCH: -- pool water level.

5 MR. KANG: We had a lot of discussions  
6 with industry at the time. When was it? December,  
7 right? And not all industry uses that generic term  
8 such as leak chase, leak chase systems, or -- so we  
9 -- probably more appropriate just to more general --  
10 make it very general, say water level. Go ahead.

11 MR. DAVIS: Nobody really looks at the  
12 leak chase system to see leakage. They watch water  
13 level. And if the water level starts dropping, then  
14 they go look at the leak chase system and see if  
15 they have a leak. That's what the industry is  
16 telling us their experience is. So we agreed to  
17 that.

18 CHAIRMAN BONACA: Please.

19 MEMBER FORD: You must forgive me if  
20 some of my questions are simple, because this is my  
21 first time on this committee. You mentioned just  
22 now inspection of accessible regions. What happened  
23 to the inaccessible regions?

24 MR. ASHAR: They were the first bullet.  
25 If you see the first bullet that we have, it was

**NEAL R. GROSS**

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

1 referring to the inaccessible areas. And that is  
2 where we concentrated, because accessible areas are  
3 being covered by the code -- code requirement, IWE.

4 MEMBER FORD: Okay.

5 MR. ASHAR: Okay. Inaccessible we were  
6 a little bit concerned about. We said did not --  
7 was not covered in the code, and we had to do  
8 something about it. So the first thing what we have  
9 done was to put some provisions in the regulation,  
10 which is 10 CFR 50.55A, the requirement that if the  
11 weaknesses are found in accessible areas that  
12 indicates degradation of the inaccessible areas,  
13 then they will go and check out what is going on in  
14 an accessible area. That is the way the rule is  
15 written.

16 Then, in NUREG-1611, we said, "If there  
17 is no evidence in the accessible area, and still  
18 there is corrosion going on, how do we get to the  
19 bottom of that?" And this way in a generic way you  
20 say, "There is no evidence. If the environment and  
21 conditions are such that could give rise to certain  
22 corrosion or degradation in inaccessible areas, that  
23 has to be investigated as a part of the license  
24 renewal."

25 MEMBER FORD: Okay.

**NEAL R. GROSS**

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

1 MR. ASHAR: And in order to resolve this  
2 particular item, we had quite a discussion with the  
3 industry on this area. And what we did was it  
4 looked like an open-ended thing for the industry.  
5 So they said, "Identify the areas that you think are  
6 the most susceptible." So we identified two areas.  
7 One was the -- under the -- just over the basement,  
8 and on the top of it, in PWRs particularly, there is  
9 a concrete -- two feet of concrete.

10 Okay. And we said, "Water always goes  
11 to the top of the -- up to the top, and then if  
12 there is cracking in the concrete, then it can seep  
13 in, and then it can degrade the liner below." That  
14 was one concern.

15 The second concern that we expressed was  
16 if the chemical constituents of the soil is  
17 aggressive enough, it can degrade the concrete  
18 foundation part. So there are the two areas that we  
19 identified, and then together with industry worked  
20 on the criteria and everything. And we came out  
21 with the criteria that we have in the GALL Report.

22 MEMBER FORD: Thank you.

23 MEMBER SHACK: Just on this water  
24 chemistry program for the spent fuel pool liner,  
25 they're arguing basically the temperature is low

**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 enough that if they control the water chemistry they  
2 can manage the cracking of the stainless steel.

3 MR. DAVIS: That's right.

4 MEMBER SHACK: And what temperature are  
5 we talking about here, and how stringent are the  
6 controls on the water chemistry?

7 MR. DAVIS: It's always below about 200  
8 degrees F.

9 MEMBER SHACK: 200F.

10 MR. DAVIS: And that's controlled.

11 MEMBER SHACK: And what controls do they  
12 put on the water chemistry, typically? I mean, it's  
13 not as pure as a BWR, obviously.

14 MR. DAVIS: It's the regular reactor  
15 vessel, RCS chemistry that --

16 MEMBER SHACK: Chemistry.

17 MR. DAVIS: -- guidelines, the EPRI  
18 guidelines. You have the same chemistry in the  
19 spent fuel pool that you have in the RCS.

20 MEMBER SHACK: RCS. I see. There's no  
21 boron additions, or something? No?

22 MR. DAVIS: Not in a BWR.

23 MEMBER SHACK: Not in a BWR.

24 MR. DAVIS: But since you're  
25 transferring fuel back and forth, you have to have

**NEAL R. GROSS**

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

1 the same chemistry.

2 MEMBER UHRIG: If you dump the water and  
3 boron in the fuel pool at all, is it soluble?

4 MR. DAVIS: In a PWR, you do. In a BWR,  
5 you do not.

6 MEMBER UHRIG: In the fuel pool.

7 MR. DAVIS: In the fuel pool.

8 CHAIRMAN BONACA: This is pretty much  
9 what they do right now, right?

10 MR. DAVIS: Yes.

11 CHAIRMAN BONACA: That's all.

12 MR. KANG: Okay. The last bullet deals  
13 with that -- the August version of GALL included --  
14 we had included cracking of metal component support  
15 members due to vibratory loads and the cyclic  
16 loading. The industry commented that there was --  
17 that this is not a license renewal item and should  
18 be deleted.

19 Their justification was that, number  
20 one, proper design eliminates or compensates for the  
21 vibrations and the cyclic loadings. And then, also,  
22 what they said was vibration characteristically  
23 leads to cracking in the short period of time on  
24 order of hours or maybe days of operations. Such a  
25 failure is probably early -- also occurs early in

**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 life..

2 Because of this time period that --  
3 because this time period is short when compared to  
4 the overall plant operating life, cracking will be  
5 identified and corrected to prevent occurrence long  
6 before the period of extended operations. And they  
7 also said that this degradation is very limited in  
8 small -- a small set of components, and there is  
9 corrective as -- as discovered.

10 The staff has agreed that cracks in the  
11 steel elements component supports caused by  
12 vibratory stress would be developed in a matter of  
13 hours or days.

14 This timeframe is not consistent -- so  
15 this timeframe is not consistent with the  
16 requirements of the license renewal rule, which  
17 addresses a slow aging process affected by extended  
18 operations. So staff agreed to delete cracking of  
19 metal components from the latest GALL Report.

20 MEMBER LEITCH: Now, that comment,  
21 again, still applies just to steel structures.

22 MR. KANG: Yes, supports. Yes.  
23 Component support sections of Chapter III.

24 CHAIRMAN BONACA: Only support section.  
25 So it doesn't affect your definition, for example,

**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 of complex assemblies that we have seen; for  
2 example, the casing of a structure like fans that --

3 MR. KANG: This is a Class I and a Class  
4 II and III and small support areas.

5 MR. MORANTE: Well, I'm not familiar  
6 with the complex structures issue on --

7 CHAIRMAN BONACA: Well, I'm talking  
8 about, for example, an HVAC fan hanging from some  
9 ceiling out there, and there are structural members  
10 that hold it. Typically, the fan will have some  
11 vibrations in it maybe.

12 MR. MORANTE: Right. I would expect  
13 that in that case we -- we must keep in mind that  
14 there are certain cases where supports, especially  
15 piping supports, may have been designed considering  
16 cyclic loading. Those are still included in GALL as  
17 -- they need to be addressed as a TLAA.

18 The areas we're considering here is  
19 where the supports for piping or other structures  
20 were not necessarily designed to withstand any type  
21 of cyclic loading. So the vibratory loading that  
22 might occur would be an unusual event, not a design  
23 basis event.

24 For the case of the fan support, one  
25 would expect that the design of that supporting

**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 system for a fan that would tend to have a certain  
2 vibratory load would be inherent in the design, and  
3 it should be considered that way. So this would not  
4 really cover that particular case.

5 CHAIRMAN BONACA: I'm trying to  
6 understand it because I know in the Hatch  
7 application that we will review tomorrow there are a  
8 number of issues to do with passive components of  
9 active systems that should be still within license  
10 renewal, and a list that was disseminated made by  
11 the SCR. And some of those passive components  
12 include casings of HVAC systems as well as frames,  
13 or whatever, supports of active components.

14 So I just am wondering, you know, when  
15 we begin to cut it so close in the different issues,  
16 and then it becomes hazy, or whether it applies,  
17 whether it doesn't apply.

18 MR. MORANTE: In the current GALL, in  
19 Chapter IIIB, we do specifically address supports  
20 for components such as fans, probably a vibration  
21 isolator. That's a specific line item in the GALL  
22 tables that are subject to review.

23 CHAIRMAN BONACA: Okay. So there is --

24 MR. MORANTE: Whether it exactly covers  
25 the case you're concerned about on Hatch, I couldn't

**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 answer that question.

2 CHAIRMAN BONACA: We'll talk about it  
3 tomorrow.

4 MEMBER SHACK: Now, again, are these  
5 anticipatory -- anticipated vibratory loads or  
6 unanticipated vibratory loads we're talking about  
7 here?

8 MR. ASHAR: I would say unanticipated.  
9 If they are anticipated, they will go into the  
10 analysis or TLAA.

11 MEMBER SHACK: Well, I mean, I can sort  
12 of envision an anticipated fatigue load I'd handle  
13 in two ways. One, I'd do a cyclic analysis, and the  
14 other one I would say, well, my vibratory loads are  
15 below my threshold, or, therefore, I can run  
16 forever.

17 MR. ASHAR: Exactly.

18 MEMBER SHACK: If I have an  
19 unanticipated load, it doesn't seem to me to follow  
20 into either one of those.

21 MR. ASHAR: And then it wouldn't be any  
22 measurement. It will be just like in the current  
23 license what is happening. Same thing will happen  
24 in an extended period of life, and it should be  
25 taken care of.

**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 MEMBER SHACK: When I find that I have  
2 vibratory loads that I didn't anticipate, I mean, I  
3 do something about it, right? I either go out and I  
4 do an analysis, or I --

5 MR. ASHAR: Yes.

6 MR. MORANTE: I'd like to address that.  
7 You're correct when you say if the -- if the  
8 vibratory loads are below the endurance limit, then  
9 you can have an infinite number of these cycles.  
10 You're not going to see a problem. So, obviously,  
11 the concern is vibratory loads that would exceed  
12 that level. If you exceed that level, and it's a  
13 true vibratory loading, you're going to generate  
14 millions of cycles in a very short period of time  
15 and are likely to generate a failure locally.

16 Now, what the industry has said is we  
17 have to deal with that in the hear and now. It's  
18 really not a license renewal issue. It's an  
19 operation -- it's an operating issue. And whether  
20 we're operating in the first 40 years of life, or  
21 years 40 to 60, is irrelevant. We have to address  
22 it when we find this kind of problem, and we  
23 basically looked at it again and said, "Yes, we  
24 agree with you that it doesn't -- it's not really a  
25 slow aging process. It's an operational problem

**NEAL R. GROSS**

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

1 that you need to address immediately."

2 So that's the reason for us removing it  
3 here.

4 MEMBER SHACK: Okay. I mean, I guess  
5 you're right.

6 MR. DAVIS: It goes into your Appendix  
7 B, Corrective Action Program.

8 MEMBER SHACK: But, I mean, it is a  
9 cumulative damage process. But in high cycle, the  
10 difference between 60 and 40 is nothing.

11 MR. MORANTE: Right. If it's going to  
12 happen in a matter of days or a week or so, does it  
13 matter at what point during that 40-year or 60-year  
14 life that it occurs? And that's the basis for  
15 removing the consideration.

16 MR. KUO: This is P.T. Kuo, License  
17 Renewal and Standardization Branch. If I may  
18 clarify a little bit. This item here only deals  
19 with those supports for the steel structures or  
20 frames or cabinets or -- it is not -- those supports  
21 are not designed for any vibratory motion.

22 If they are, then it will be designed  
23 according to the fatigue rule that -- that is  
24 described in ASME Code Section 3 or used under the  
25 code requirement. But these are those things that

**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 are not designed according to those rules, not  
2 required to design -- to be designed according to  
3 those rules.

4 And that the vibration were due to some  
5 unanticipated sources like pump vibrations. We  
6 never expect it, but because of some other reasons  
7 it vibrates, you know, high vibration amplitude.  
8 There are two ways to mitigate those problems. One  
9 is to immediately correct the problems, the problem  
10 source. The other one is that if it vibrates really  
11 with high intensity, you see the result right away.  
12 It doesn't accumulate from 40 to 60.

13 CHAIRMAN BONACA: Okay. Any other  
14 questions? If not, then I think we need a break.  
15 It's 20 of 10:00. So we will meet again at five of  
16 10:00.

17 (Whereupon, the proceedings in the  
18 foregoing matter went off the record at  
19 9:40 a.m. and went back on the record at  
20 9:56 a.m.)

21 CHAIRMAN BONACA: Okay. Let's resume  
22 the meeting now, and we have a presentation on  
23 Chapter IV of the GALL Report.

24 MR. DOZIER: Yes, sir. Good morning.  
25 My name is Jerry Dozier from the License Renewal and

**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 Standardization Branch. I have Barry Elliot from  
2 Engineering, Omesh Chopra from Argonne National Lab,  
3 and Mike McNeil from Research.

4 Chapter IV deals with the reactor vessel  
5 internals, the vessel itself, and also the reactor  
6 coolant system. These five bullets represent  
7 examples where public comments were resolved for  
8 repackaging, providing minimal acceptable programs,  
9 providing a real focus of concern, ensuring  
10 relevance and completeness in the GALL Report.

11 For the first item, that's an example of  
12 repackaging. In the ACRS meeting, we had  
13 considerable discussion about neutron fluence  
14 levels, and what is the threshold for ISCC, or when  
15 does void swelling come into effect. We also had  
16 industry discussions and debates about that  
17 particular issue.

18 On the one hand, it was an argument of  
19 accounting of materials versus thresholds, or we  
20 could focus on what we really wanted the aging  
21 management program to be. What we really wanted in  
22 this aging management program was to monitor the  
23 most susceptible locations and provide a method for  
24 inspection to detect that mechanism.

25 And that's what we really wanted, and we

**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 wrote an additional program, and it was consistent  
2 with Calvert Cliffs, that would accept that program.  
3 And if the licensee was willing to do that, then it  
4 would require no further evaluation.

5 The second one deals with minimal  
6 acceptable programs. Earlier, in the August  
7 edition, we had boric acid corrosion, and we also  
8 credited in-service inspection. NEI goes into --

9 MEMBER LEITCH: Before you move on to  
10 the second bullet there, where is the -- could you  
11 point me to the section in GALL where the change was  
12 made?

13 MR. DOZIER: Yes, sir. In Chapter XI,  
14 Program M16 titled "PWR Vessel Internals" is the new  
15 program that was written.

16 MEMBER LEITCH: Okay. Thank you.

17 MR. DOZIER: Was there any question?

18 MEMBER LEITCH: No. I just --

19 MR. DOZIER: Okay.

20 MEMBER LEITCH: -- want to know for  
21 reference. That's all.

22 MR. DOZIER: Yes, sir.

23 For boric acid corrosion, as we see it  
24 earlier, ISI could be a mechanism also -- could be a  
25 program that could be credited. NEI asked for the

**NEAL R. GROSS**

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

1 minimal acceptable program. Boric acid corrosion  
2 has been effective in the current term, and we feel  
3 like that it would be effective in the extended term  
4 for controlling boric acid corrosion.

5 So now in GALL we only have the boric  
6 acid corrosion program monitoring being credited for  
7 the boric acid corrosion.

8 CHAIRMAN BONACA: The boric acid  
9 corrosion problem, this is a visual program?

10 MR. DOZIER: Yes, sir. It is a visual  
11 program, whereas in ISI we were also looking at  
12 crediting possibly -- when the -- during the  
13 pressure test, you make it to detect some boric acid  
14 corrosion. If it was in an inaccessible area, or if  
15 it was covered by insulation, we thought that it  
16 might be effective, you know, also for that. For --

17 CHAIRMAN BONACA: And this is all  
18 components, anything which is effective -- this is  
19 effective boric acid corrosion. I mean, so in  
20 general it doesn't talk about --

21 MR. ELLIOT: This is not a coupon  
22 program. This is an inspection program of the  
23 actual components.

24 CHAIRMAN BONACA: Okay. I understand.  
25 All right.

**NEAL R. GROSS**

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

1 MR. DOZIER: Okay. The next one is an  
2 example of how we got -- we made GALL more focused.  
3 Earlier this was -- this PWSCC was primarily plant-  
4 specific, but now we focused it on for -- for the  
5 Inconel 600 penetrations they are primarily being  
6 adequately managed by the chemistry and ISI program.

7 However, for the Inconel 182 welds, we  
8 do need a plant-specific evaluation. Now, of  
9 course, in that example, again, we're trying to  
10 focus the licensee really where they need to be in  
11 the -- or what we really want to see in the review  
12 process.

13 There was also some comments that for --  
14 for some components there were a lot of aging  
15 effects. And sometimes maybe one or two of those  
16 aging effects may not have been really applicable,  
17 and we removed those from the GALL Report. For  
18 example, wear/loss of material for the core support  
19 pads and the guide tubes. Those were really not  
20 significant and we removed them.

21 Have we removed the component? No.  
22 They are still in there. Just that particular aging  
23 effect was removed.

24 CHAIRMAN BONACA: Just because we  
25 haven't seen wear or loss of material for core

**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 support pads and guide tube cards? Or why else?

2 MR. ELLIOT: That's the reason. They've  
3 been looking at it over the years, the industry, and  
4 they -- and they mention it as something they look  
5 for, but they haven't seen anything significant. So  
6 since it was not significant all these years, that  
7 we've decided to remove it and concentrate on the  
8 other aging effects that could affect these  
9 components.

10 CHAIRMAN BONACA: But you are telling me  
11 they are looking at them. That's why they know that  
12 there isn't. So --

13 MR. ELLIOT: Right.

14 CHAIRMAN BONACA: -- I mean, it's a  
15 closed circle. Are they going to stop looking at  
16 them, because --

17 MR. ELLIOT: No. There's an ISI  
18 program, you know --

19 CHAIRMAN BONACA: No. I mean -- all  
20 right. So it's not specific -- specifically tied to  
21 license renewal, but it's still -- okay. So there  
22 is not a commitment under license renewal. That's  
23 what you're saying.

24 MR. ELLIOT: Right.

25 MR. DOZIER: The last bullet is more of

**NEAL R. GROSS**

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

1 a completeness issue. One of the -- we had several  
2 comments where NEI would ask for additional  
3 components be added, so that they could be credited.  
4 And we tried to accommodate those requests, so that  
5 it would be easier for the licensee to reference the  
6 GALL Report.

7 In this case, we are talking about the  
8 CRD head penetration. That was an NEI comment.  
9 Actually, this incore neutron flux monitoring tubes  
10 was a request from Union of Concerned Scientists.  
11 So we tried to accommodate and make GALL as complete  
12 as we could based on those comments.

13 CHAIRMAN BONACA: Before you move on, if  
14 you could go back to that PWSCC of pressurizer  
15 Inconel 600 penetrations. Now, here the concern you  
16 -- the intent was to focus the program where it's  
17 needed, you said. Okay?

18 MR. DOZIER: Yes.

19 CHAIRMAN BONACA: Is there a concern  
20 that when you begin to focus too much you may not --  
21 now you may inadvertently neglect some areas where,  
22 you know, you don't know exactly but it would be --  
23 you know what I'm trying to say?

24 MR. DOZIER: Okay. Well, the GALL  
25 Report actually is a self-check mechanism in it, and

**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 it -- even though -- say we don't mention an aging  
2 effect. If we don't mean the aging effect, that  
3 does not relieve the licensee to identify that  
4 effect and also report it to us in that application.  
5 He can only take credit for the things that are  
6 enveloped in the GALL Report.

7 So any -- any other -- that's the good  
8 thing about GALL is that any new aging effects, or  
9 whatever, that may come down the pike, if we have  
10 not addressed them, they will come in as a plant-  
11 specific evaluation.

12 Barry, I think you --

13 MR. ELLIOT: Yes. On PWSCC of the  
14 pressurizer, 600 components, what our experience is  
15 today is that the 600 component is-- the limiting  
16 materials are in the upper head. And that's where  
17 we're concentrating our inspections and our efforts.

18 If we see in the current license that we  
19 need to expand the locations for inspection, then we  
20 would -- we might include the pressurizer. But at  
21 the moment, our experience is that the Inconel 600  
22 type cracking is in the upper head. And so that's  
23 where we're concentrating our effort.

24 The Inconel 182, of course, is a recent  
25 issue, and it has more -- you know, it is in a lot

**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 more locations, safe-ends, and all over, and that  
2 gets -- and that's why it's plant-specific.

3 CHAIRMAN BONACA: Okay. I think you  
4 have answered my question. My concern was when you  
5 focus on something, it implies that you know exactly  
6 where to look. Now, you know, these are -- there  
7 are so many applications of this -- different  
8 materials there, and that was the question I was  
9 asking you. And you answered that.

10 MR. DOZIER: Okay. From Chapter IV, we  
11 had a couple of issues that we were continuing the  
12 NEI dialogue on. One of those dealt with the  
13 operating experience with cracking of small-bore  
14 piping, and the other was management of loss of  
15 preload of reactor vessel internals bolting using  
16 the loose parts monitoring system. And those we are  
17 continuing the dialogue with NEI to come to  
18 resolution on.

19 MEMBER SHACK: Okay. Can you describe  
20 the issues of contention here?

21 MR. DOZIER: The first deals with small-  
22 bore piping, and basically they are asking about the  
23 operating experience. They are saying, have we  
24 really got enough operating experience for us to  
25 justify the one-time inspection that we are -- that

**NEAL R. GROSS**

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

1 we now have in the GALL Report? If you look at some  
2 of the operating experience, they may be because of,  
3 say, a weld defect, or there may be some event-  
4 driven issue.

5 But our bigger issue is that we feel  
6 like this -- that small-bore piping will be a  
7 concern in the extended period. So, really,  
8 regardless of our operating experience, we probably  
9 still want to pursue the small-bore piping.

10 And also, there is a -- a materials  
11 research project being performed by EPRI, and we  
12 want to follow that and -- you know, for the  
13 complete resolution of small-bore piping. So I  
14 think that -- in that particular case, it's really  
15 an issue that's -- that's continuing forward, and so  
16 it's one good to keep a dialogue on.

17 The next deals with loss of preload of  
18 reactor vessel internals bolting. Their contention  
19 is that ISI is good enough. We credited also the  
20 loose parts monitoring system, you know, for this  
21 aging effect. And the real issue is, is ISI good  
22 enough? And we're still exploring that.

23 Also, with loose parts monitoring, some  
24 of them took -- took loose parts monitoring out of  
25 their tech specs and had -- have not -- have not now

**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 got it even plugged up, or I guess not operating  
2 further. What we don't want GALL to be is a  
3 document that says, "This is the minimum program."  
4 If they don't have a loose parts monitoring system,  
5 of course, they can come up with any plant-specific  
6 ways to monitor that aging effect.

7 MEMBER SHACK: Well, I thought that's  
8 what GALL was was a minimum program, that this is  
9 what you have to have. If you have anything more,  
10 that's fine and dandy.

11 MR. ELLIOT: I think industry is arguing  
12 that loose parts monitoring is an additional program  
13 that they don't need for monitoring this aging  
14 effect, and that their concern -- it's our concern,  
15 too -- is that you don't want to put in a program  
16 that monitors a particular aging effect, and that  
17 puts the plant in a less safe condition. Like what  
18 happens if they -- one of the problems, they have  
19 loose parts monitoring. They've shut plants down  
20 looking for things that were not there.

21 So that we don't want to start that --  
22 down that road again. We've already done it in the  
23 current license, take out the loose parts  
24 monitoring. We don't want to put it back in. You  
25 know, we're discussing that, whether it's necessary

**NEAL R. GROSS**

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

1 to manage this aging effect using that.

2 MR. DOZIER: The way it initially got in  
3 there was actually through a Westinghouse topical  
4 report that referenced that was the way they would  
5 do it. So we kind of got the idea from them, and  
6 then as this has grown we've learned more. And,  
7 again, I think the dialogue in this particular case  
8 is a good one to keep going.

9 MEMBER LEITCH: Can you help me work my  
10 way through here? I'm trying to find out about BWR  
11 circumferential welds. All right? So when I go to  
12 the -- I go to the GALL Report, and A.1.2 is for BWR  
13 vessel shelves, and I guess an intermediate belt  
14 line shell.

15 MR. ELLIOT: Do you want to take a look  
16 at this?

17 MEMBER LEITCH: Please, yes.

18 MR. ELLIOT: Okay. Page 5 -- 4.A.1.5.

19 MEMBER LEITCH: 4.A.1.5. Okay. And  
20 that's -- is that --

21 MR. ELLIOT: And it is the vessel shell  
22 -- intermediate belt line shell, belt line welds,  
23 and the aging effect is loss of fraction toughness,  
24 neutron irradiation embrittlement. Do you have  
25 that?

**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 MEMBER LEITCH: Yes. Right.

2 MR. ELLIOT: In managing neutron  
3 irradiation in BWRs we look at the impact of the  
4 radiation embrittlement on the pressure temperature  
5 limits, on the upper shelf energy, and we look at  
6 the impact of the radiation embrittlement on whether  
7 or not we need to -- a circumferential weld  
8 inspection.

9 MEMBER LEITCH: Right.

10 MR. ELLIOT: And under the current  
11 licensing term, we did a review and we determined  
12 that the failure probability for circumferential  
13 welds were so low that we didn't need to include a  
14 circumferential weld inspection, that we could get  
15 along with just the axial weld inspection as like  
16 they would be more susceptible to cracking than --  
17 the radiation embrittlement than the circumferential  
18 weld. And that analysis was done for four years.

19 MEMBER LEITCH: Right.

20 MR. ELLIOT: And it assumes certain  
21 radiation embrittlement criteria. Now, as long as  
22 you met that criteria for the 60 years, you would  
23 still satisfy the failure probability evaluation  
24 which was used for the first 40 years. And that's  
25 what this is intended to do is it -- is for the

**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 licensees to show how they meet that neutron  
2 irradiation embrittlement criteria.

3 MEMBER LEITCH: And there's a discussion  
4 about 64 effective full power years?

5 MR. ELLIOT: Well, 64 -- okay. What we  
6 did, we did the original evaluation of the BWRVIP  
7 05, which is circumferential weld. They did the  
8 original evaluation for 32 years, effective full  
9 power years. And the ACRS raised the question: is  
10 this a cliff, that if you go past 32 effective full  
11 power years all of a sudden does radiation  
12 embrittlement cause a high increase in failure  
13 probability?

14 So we asked the VIP to evaluate 64  
15 effective full power years, twice the amount of  
16 time. And they did. And it didn't fall off a  
17 cliff. It was a gradual change in radiation  
18 embrittlement.

19 For license renewal, we wouldn't be  
20 using the 64 effective full power year criteria. We  
21 would want them to meet -- and our evaluation was  
22 for the 32 effective full power criteria. We would  
23 want them to show that at 48 effective full power  
24 years they could meet the 32 effective full power  
25 criteria.

**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 MEMBER LEITCH: Okay. So 48 effective  
2 full power years for --

3 MR. ELLIOT: Forty-eight effective full  
4 power is 60 years.

5 MEMBER LEITCH: -- 60 years.

6 MR. ELLIOT: Eighty percent, 60 years.

7 MEMBER LEITCH: Yes. So the reason  
8 we're not requiring inspection of the  
9 circumferential welds is basically even at 60 years,  
10 or 48 effective full power years, they have an  
11 extremely low probability of failure.

12 MR. ELLIOT: Yes.

13 MEMBER LEITCH: And plus the fact  
14 there's a requirement to do some additional operator  
15 training to --

16 MR. ELLIOT: Yes, that's part of -- we  
17 found out that there are certain events that are key  
18 to this that could cause -- that are significant.  
19 As long as they have operator training to preclude  
20 those events, that's like a defense in depth.

21 MEMBER LEITCH: Are these welds  
22 particularly difficult to inspect?

23 MR. ELLIOT: Yes. They're --

24 MEMBER LEITCH: More difficult than the  
25 axial welds or --

**NEAL R. GROSS**

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

1 MR. ELLIOT: It's a matter of location.  
2 I mean, the axial welds are hard, too. It's -- you  
3 need special equipment for the axial welds also.

4 MEMBER LEITCH: Okay. Thank you.

5 MEMBER UHRIG: One question. You  
6 alluded to the 32 years or 48 years.

7 MR. ELLIOT: Effective full power.

8 MEMBER UHRIG: Effective full power  
9 years. And given the increased performance in the  
10 last few years of the plants, it's likely that one  
11 of these limits is going to be exceeded before the  
12 license expires. Are you -- how do you -- it's the  
13 license that controls, not the 48 --

14 MR. ELLIOT: What really controls here  
15 is not the 48 effective full power years or the 32,  
16 whatever. It is neutron fluence. That's what we're  
17 really using here. So as long as the neutron  
18 fluence estimate they use for the evaluation,  
19 whether it's 32 or 48 or whatever, is not exceeded  
20 by the end of the license, then they're adequate.

21 MEMBER UHRIG: Okay.

22 MR. ELLIOT: And as long as they monitor  
23 the neutron fluence, which is what they do, and they  
24 stay within their limit, whatever they said is in  
25 their application, they're going to meet the

**NEAL R. GROSS**

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

1 criteria.

2 MR. DOZIER: Any further questions for  
3 Chapter IV or -- Dr. Bonaca, I think you had  
4 mentioned some -- maybe some SRP questions for  
5 Section 3.1.

6 CHAIRMAN BONACA: We had some questions,  
7 yes. If I remember -- well, there were some areas  
8 which were eliminated from the previous draft, like  
9 I can give some examples of one I notice. One was  
10 under -- in management division. That's probably  
11 for the next presentation, right?

12 MR. DOZIER: Yes.

13 CHAIRMAN BONACA: Okay. So I'll wait  
14 for that. We talked about the complexity of  
15 performing inspections on welds. And any lessons  
16 learned from the disassemble experience on those  
17 nozzles?

18 MR. ELLIOT: Well, it says that we used  
19 to be very concerned about Inconel 600. Now we're  
20 really concerned about the welds.

21 (Laughter.)

22 In fact, much more concerned about the  
23 welds. And that's reflected here.

24 CHAIRMAN BONACA: Well, I'm more  
25 concerned about the inspections, actually. I mean

**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 --

2 MR. ELLIOT: Right.

3 CHAIRMAN BONACA: -- it says that, you  
4 know, here you have full inspections and --

5 MR. ELLIOT: Right.

6 CHAIRMAN BONACA: -- you see nothing,  
7 and then you have a crack, and then you inspect  
8 again and you find --

9 MR. ELLIOT: Right.

10 CHAIRMAN BONACA: Which it seems to me  
11 the whole aging and, in general, license renewal is  
12 predicated on inspecting, seeing, and fixing. And  
13 so that's why I asked the question I guess.

14 MR. ELLIOT: Yes. I mean, whatever we  
15 work out in the current term for the Inconel 182, I  
16 mean, will carry forward into the license renewal  
17 term for inspection.

18 CHAIRMAN BONACA: Okay. Thank you.

19 MR. ELLIOT: Okay. Thank you very much.

20 MEMBER LEITCH: Excuse me. I had  
21 another question. I guess -- excuse me for jumping  
22 around here, but this concerns the generic safety  
23 issue, and I guess the issue is basically there's a  
24 concern that the effects of the reactor coolant  
25 environment on the fatigue life of components were

**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 not adequately addressed in the code of record. I'm  
2 referring here to the -- to page 4.3-2 of the SER.

3 And I guess my comment is that it seems  
4 like 40 years is at the margin, and I'm wondering  
5 how we can justify 60 years. Is that --

6 MR. ELLIOT: Okay. First, I'm not the  
7 fatigue expert. The fatigue expert is John Fair,  
8 and he can answer this question a lot better. But  
9 what I will say is that -- that as far as GALL is  
10 concerned, fatigue is a TLAA and it has to be  
11 evaluated by each plant. And that's how we handle  
12 it for GALL, because we are concerned that they  
13 could exceed the limit between -- during the  
14 operating term.

15 MR. CHOPRA: I just wanted to add one --  
16 that GALL requires them to address for all Class I  
17 components to address the effect of environment on  
18 fatigue.

19 MR. KUO: This is P.T. Kuo, License  
20 Renewal and Standardization Branch again. The  
21 fatigue issue will be addressed in Chapter IV of the  
22 GALL Report. That is the TLAA, and you will see  
23 some generic programs in Chapter X of GALL.

24 MEMBER LEITCH: In Chapter which?

25 MR. KUO: Chapter X.

**NEAL R. GROSS**

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

1 MEMBER LEITCH: Chapter X.

2 MR. KUO: Yes.

3 MEMBER LEITCH: And we're going to  
4 discuss that a little later today?

5 MR. KUO: Right.

6 MEMBER LEITCH: Okay. Thank you.

7 MR. KUO: You're welcome.

8 MR. DOZIER: Thank you.

9 MR. KLEE: Good morning. My name is  
10 Edmund Klee, and I'm representing the License  
11 Renewal Branch. On my right is Mr. James Davis, and  
12 on my left is Mr. Crockett Petney, and we also have  
13 Chris Parchuski, all from the NRR, Division of  
14 Engineering.

15 I would like to present the first four  
16 changes or items on this slide, which indicate the  
17 flavor of the changes between the August and current  
18 versions of GALL for Chapter V.

19 The first item is that water chemistry  
20 adequately manages transgranular stress corrosion  
21 cracking in the containment spray and safety  
22 injection systems of a PWR. Stress corrosion  
23 cracking for stainless steel components exposed to  
24 borated water can occur at temperatures below 200  
25 degrees Fahrenheit only if containments like

**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 sulphites, sulphates, and chlorides are present in  
2 the water.

3 Stress corrosion cracking does not occur  
4 if water chemistry controls the level of those  
5 containments below stated levels.

6 You have previously addressed the change  
7 in the SRP Section 3.2.2.2. There was a renumbering  
8 of that section of the SRP, and the particular  
9 section that you're talking about was deleted  
10 because there was no further evaluation of stress  
11 corrosion cracking in regard to the safety injection  
12 tanks and the refueling water tanks, because the  
13 one-time inspection was no longer required.

14 CHAIRMAN BONACA: Okay. I understand.  
15 Okay. So it's the elimination of those chapters.  
16 That's what I imagined, but I wasn't clear there.  
17 So the elimination was due to the fact that the  
18 concern is gone; you don't have to address it  
19 specifically anymore.

20 MR. KUO: Right.

21 CHAIRMAN BONACA: That's why you don't  
22 have that.

23 MR. KUO: Right.

24 MR. LEE: This is Sam Lee. That's what  
25 we meant when we changed the GALL Report. We just

**NEAL R. GROSS**

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

1 made the conforming changes in the SRP. So when you  
2 see the SRP, some of the things have disappeared,  
3 because they have disappeared from GALL.

4 CHAIRMAN BONACA: Yes. What about the  
5 other issue of those headings where there is a full  
6 description of the program, but then in parentheses  
7 there is written program no longer --

8 MR. LEE: You'll hear that. We're going  
9 to discuss that later.

10 MEMBER LEITCH: Does the water chemistry  
11 program, in addition to prescribing steady state  
12 limits, also discuss actions for excursions, say,  
13 unexpected chloride intrusion or --

14 MR. KLEEH: What I would think would  
15 happen here is that the water chemistry is a program  
16 -- is an existing program. So the plant -- the  
17 licensee would address that under Appendix -- or 10  
18 CFR 50, Appendix B, for any corrective actions that  
19 had to be taken. It's an existing program, so it  
20 will be addressed in that manner.

21 MEMBER LEITCH: Okay.

22 MR. KLEEH: The next item is that  
23 general corrosion causes loss of material for carbon  
24 steel components in air but not for stainless steel  
25 components exposed to water systems. Pitting and

**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 crevice corrosion of carbon steel require an aqueous  
2 environment, with their aggressiveness dependent on  
3 local chemistry conditions like oxygen levels and  
4 component configuration.

5 And also, general corrosion is a  
6 thinning of a metal surface due to chemical attack  
7 on aggressive environment, but stainless steel  
8 components are not susceptible to it unless  
9 containments are present. This was just a  
10 conforming change that we made to GALL Chapter V.

11 The third item is that filters are  
12 considered short-lived components. They are  
13 typically replaced based on performance conditioning  
14 monitoring, which indicates the end of each of their  
15 qualified lives. They may excluded on a plant-  
16 specific basis from aging management review under 10  
17 CFR Part 5421.

18 And not to further elaborate on it, but  
19 this was also -- there was also a deletion here in  
20 SRP.

21 And the last item is management of  
22 external surfaces of carbon steel components is  
23 plant-specific. Only service Level I coatings are  
24 in scope of the aging management program for  
25 monitoring and maintenance of coatings. The

**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 intended function of a component is not affected by  
2 the degradation of its service Level II and III  
3 coatings.

4 Are there any questions on the items  
5 that I've covered?

6 MEMBER FORD: I have a question. You  
7 made some very definitive statements on the first  
8 two bullets as to when you are going to or not get  
9 localized corrosion, stress corrosion, pitting,  
10 etcetera. Unfortunately, we know from history that  
11 you are always bitten in the future by such an  
12 occurrence. You've changed something in material or  
13 the environment which you did not anticipate.

14 How are those unanticipated changes  
15 covered in this whole process? And, again, I'm  
16 talking from lack of knowledge.

17 MR. KLEE: I'll let James Davis answer  
18 that question.

19 MR. DAVIS: That, again, goes into your  
20 Appendix B, Corrective Action Program.

21 MEMBER FORD: Okay.

22 MR. DAVIS: So you deal with it as an --

23 MEMBER FORD: So the whole process is  
24 compliant enough that you can take into account  
25 these unanticipated things in the future.

**NEAL R. GROSS**

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

1 MR. DAVIS: Yes, that's the purpose of  
2 the Appendix B program is when you have an unusual  
3 occurrence, then you take corrective action.

4 MEMBER FORD: Okay.

5 MR. DAVIS: You analyze the situation,  
6 determine why it occurred, and then you correct it  
7 with your corrective action program.

8 MR. GRIMES: This is Chris Grimes. I'd  
9 like to add to that that the requirements for the  
10 renewed license also provide that the -- this  
11 revised licensing basis, for which there is  
12 significant industry sensitivity to the extent of  
13 the commitments for these aging management programs,  
14 it provides the boundaries upon which Appendix B  
15 operates because if the design has changed, or if  
16 the environment has changed, or if the assumptions  
17 associated with the effectiveness of the aging  
18 management programs somehow are changed in the  
19 future, then the renewed license demands that those  
20 changes be addressed in terms of their impact on the  
21 licensing basis.

22 So if we're bitten somehow in the  
23 future, it would be our expectation that the  
24 licensing basis would be maintained by these  
25 departures being addressed with respect to the

**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 effectiveness of aging management.

2 MR. DAVIS: Event-driven occurrences are  
3 included from this license renewal and from GALL.  
4 So if it's some event that occurs, you don't  
5 consider it in GALL, like a spill or something like  
6 that.

7 MEMBER FORD: Well, I wasn't talking  
8 about things like spills or other things like that.  
9 I was talking about major systemic problems, like we  
10 didn't know that core cracking would occur until it  
11 occurred.

12 MR. DAVIS: That's right.

13 MEMBER FORD: And now that -- in the  
14 hind events, we know why it occurred, but we didn't  
15 know at time zero.

16 MR. KLEE: That concludes the  
17 presentation on these first four items. The next  
18 items on this slide and the one on the following  
19 slide will be presented by Kimberley Rico.

20 MS. RICO: Hi. My name is Kimberley  
21 Rico. I'm with the License Renewal Branch. The  
22 fifth bullet on the screen is an issue raised by NEI  
23 concerning biofouling and the buildup of deposits.  
24 And it -- the issue of whether flow was an active  
25 function, and we determined that biofouling affects

**NEAL R. GROSS**

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

1 both flow performance and pressure boundary  
2 integrity. But flow performance is considered an  
3 active function covered under the current licensing  
4 basis and should not be included within the scope of  
5 license renewal.

6 However, biofouling causes loss of  
7 material, which affects the pressure boundary, and  
8 this passive function requires aging management. So  
9 however -- in order not to contradict the license  
10 renewal issue Number 98-105, which states that the  
11 heat transfer function for heat exchangers is within  
12 the scope of license renewal. So biofouling was  
13 kept in for the heat exchanger tubes for buildup of  
14 deposits.

15 The last bullet on the screen is we  
16 added an alternative AMP to the Chapter XI for the  
17 buried piping. NEI was concerned with the current  
18 program that we had, followed the NACE standards,  
19 and we didn't want the NACE standards which aren't  
20 currently required to become the standard, that we  
21 wanted to give them an alternative program.

22 And that was one of the purposes of GALL  
23 was that eventually it would be multiple AMPs for  
24 certain aging effects. And so we created a new AMP  
25 -- M34 and buried piping tanks and inspection.

**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           MEMBER LEITCH: On that biofouling  
2           issue, just -- I'm still thinking about that a  
3           little bit. You said that you did include  
4           biofouling as an aging management program?

5           MS. RICO: Yes. We kept biofouling as  
6           an aging mechanism, but we -- the effect is loss of  
7           material.

8           MEMBER LEITCH: Not heat transfer.

9           MS. RICO: Well, in the heat exchanger  
10          tubes we kept buildup of deposit, the restriction of  
11          flow, as the aging effect mechanism for the -- only  
12          the heat exchanger tubes.

13          MEMBER LEITCH: Okay. But does that --  
14          did you think about plants that are now experiencing  
15          asiatic clams in their cooling water systems?  
16          There's growing concern about asiatic clams.

17          MR. DAVIS: The zebra mussels probably.

18          MEMBER LEITCH: The zebra mussels, yes.

19          MR. DAVIS: Generic Letter 89-13  
20          addresses service water fouling, and in that one of  
21          the ways they suggest that you control or monitor  
22          fouling is by measuring the efficiency of your heat  
23          exchangers. And you can tell very quickly if you're  
24          having a problem either from fouling or from zebra  
25          mussels.

**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 MR. BARTON: That's covered by existing  
2 programs, right?

3 MR. DAVIS: That's an existing program.

4 MEMBER LEITCH: Okay. So that's  
5 excluded from the aging management, then.

6 MR. GRIMES: This is Chris Grimes. And  
7 I hope you won't think I'm overly trite, but we did  
8 have some difficulty trying to draw this fine  
9 distinction between what are active functions and  
10 what are passive functions. And quite candidly, the  
11 performance monitoring -- those things that get to  
12 flow and heat exchanger efficiency, they are much  
13 more palatable if you think of them in terms of the  
14 active system demands and performance and system  
15 reliability.

16 And so for our purpose we focused on  
17 aging effects. Heat transfer is not an aging  
18 effect. Heat transfer is more related to system  
19 performance that is challenged on a fairly frequent  
20 basis. But we couldn't extend that logic to the --  
21 so far as to say that crud buildup doesn't have some  
22 impact on loss of material, which is an aging  
23 effect. So that was -- that's the focus of GALL.  
24 And it is a rather subtle and fine distinction, and  
25 it's not really easy to articulate.

**NEAL R. GROSS**

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

1 MEMBER LEITCH: Yes. Another concern  
2 that I had in that area, the plant, as you think out  
3 in terms of the forebay and dredging considerations,  
4 and all that type of thing which, you know, that --  
5 that is -- like silt building up in the intake is a  
6 function that develops over a long period of time.  
7 And I don't know whether that would be an active or  
8 a passive type of thing. I guess that's one of  
9 those things that's kind of on the cusp as well.

10 MR. GRIMES: That's correct. And we  
11 would -- you know, if the reviewers look at the --  
12 at this distinction, and they test it with operating  
13 experience. And to the extent that we have delved  
14 into the area of the impacts of zebra mussels and  
15 other impacts on system performance, we still have  
16 to step back and say, yes, but to what extent are  
17 these things -- aging effects -- age related? And I  
18 think that we've been fairly sensitive to making  
19 that fine distinction.

20 And we still have to -- we still have  
21 the system performance tests and the active features  
22 that provide protection in the future in the event  
23 that we find some long-term impact going on that  
24 needs to be addressed.

25 MEMBER LEITCH: Yes. Thanks.

**NEAL R. GROSS**

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

1 MEMBER SHACK: Just coming back to this  
2 last bullet again, in the earlier version of GALL  
3 you had the NACE program as an acceptable aging  
4 management program.

5 MR. DAVIS: That's right.

6 MEMBER SHACK: What you did then was  
7 create another new -- I mean, a plant could have  
8 always come in with a plant-specific alternative.  
9 You just created a new generic management program,  
10 presumably based on some fairly typical plans, is  
11 that --

12 MR. DAVIS: What we did was we basically  
13 did what Calvert Cliffs and Hatch and ANO and Turkey  
14 Point proposed, and that is when they go in to do  
15 maintenance they're going to dig up the pipe and  
16 they'll examine the coatings at this point.  
17 Whereas, when I originally wrote it, I put the NACE  
18 standards of cathodic protection and coating.  
19 Nobody really does that, and they don't want to take  
20 credit for the rectifiers, because they're not --  
21 they weren't purchase safety-related. So that  
22 causes a problem for them.

23 So we -- rather than fight about it, we  
24 agreed with NEI that we would offer either  
25 alternative. In the case of Oconee, they have 11-

**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 foot diameter pipes, and they actually are going to  
2 inspect from the inside of the pipe. And that's  
3 about 80 percent of their buried pipe is 11-foot  
4 diameter pipe. So that wasn't put into GALL because  
5 we thought that was an unusual occurrence. But they  
6 can also propose any other program that they want  
7 when they come in.

8 CHAIRMAN BONACA: This is AM34. That's  
9 the one he quoted. Okay.

10 MS. RICO: And the last change to GALL  
11 was the addition of a selective leaching program.  
12 Some materials were added that NEI had asked for  
13 that are used in plants, and selective leaching was  
14 identified as the aging mechanism. And we created  
15 selective leaching, which was modeled off of Oconee.

16 And those were all the significant  
17 changes that were made to V, VII, and VIII.

18 Now, for the NEI continued dialogue  
19 items, the first one is concerned with bolting, and  
20 NEI feels that the aging effect and mechanism of  
21 crack initiation and growth due to cyclic loading  
22 and stress corrosion cracking for carbon steel  
23 closure bolting and high pressure or high  
24 temperature systems is not necessary. And I'll let  
25 Jim Davis further --

**NEAL R. GROSS**

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

1 MR. DAVIS: It's the issue of the 150  
2 yield strength. If it's up over 150 yield strength,  
3 those bolts will crack in air. And we've raised  
4 this with every utility so far, and they want us to  
5 take that out of GALL. But we're not going to.

6 (Laughter.)

7 MR. BARTON: End of dialogue.

8 (Laughter.)

9 The decision has been made.

10 MR. GRIMES: This is Chris Grimes. I  
11 want to emphasize that dialogue will continue.

12 (Laughter.)

13 MS. RICO: And the second item is  
14 concerned with additional requirements above the  
15 NFPA commitments. And I'll let Tanya Eaton from the  
16 Plant Systems Branch just briefly go over what these  
17 two additional requirements are.

18 MS. EATON: Hi. I'm Tanya Eaton.  
19 Basically, the concern that we had was that there  
20 was a requirement in GALL for fire protection  
21 systems that inspections should be performed to  
22 monitor through internal inspections. NFPA does not  
23 have requirements that currently require licensees  
24 or anybody that has a fire suppression system to go  
25 in and look at the pipe and to trend changes over

**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 time to the diameter which could affect the wall  
2 thickness and eventually affect the pressure  
3 differences in the system.

4 And so in order to meet the requirements  
5 of GALL you have to go beyond what's currently in  
6 the NFPA codes.

7 MR. BARTON: So where are you on this  
8 one?

9 MS. EATON: We're still -- I don't know  
10 if NEI -- what NEI's position is. We haven't spoken  
11 to them in a while. So it's my understanding that  
12 we are just going to continue dialogue.

13 MR. BARTON: Okay.

14 CHAIRMAN BONACA: That's in one of the  
15 open issues of Hatch, still open somewhat. Well,  
16 that's more because of the particular area of the  
17 fire protection, not the specific issue.

18 MR. GRIMES: That's correct.

19 CHAIRMAN BONACA: Okay.

20 MR. GRIMES: Arkansas and Hatch were  
21 both challenged by fire protection scoping issues.

22 CHAIRMAN BONACA: Yes.

23 MR. GRIMES: But the issue that Tanya  
24 described is basically our expectations about  
25 monitoring programs that would be relied on for

**NEAL R. GROSS**

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

1 aging management with respect to the pressure  
2 boundary which is -- as Tanya explained, our  
3 expectation goes beyond what NFPA currently  
4 requires, or NFPA code currently requires.

5 CHAIRMAN BONACA: Okay.

6 MS. RICO: Are there any further  
7 questions?

8 MR. BARTON: Yes. Chapter VII -- are  
9 you covering VII?

10 MS. RICO: Yes.

11 MR. BARTON: D.2 in VII, compressed air  
12 systems. If you look at the scope in that section  
13 it does not cover the pressurized air receivers,  
14 which are usually carbon steel tanks and corrode and  
15 get full of moisture and operators forget to bow  
16 them down, and la-di-da, la-di-da. Where are they  
17 covered with respect to age managing and corrosion?

18 MS. RICO: I'm not sure on that one.

19 MR. DAVIS: I think if there's moist air  
20 in there it's covered.

21 MR. BARTON: It's not covered in D.2.  
22 So where is it covered?

23 MR. DAVIS: Okay. I'll have to look.  
24 I'm not sure.

25 MR. GRIMES: We'll find that, because

**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 I'm sure that the -- I remember the question coming  
2 up about the treatment of receivers, but I can't  
3 recall specifically where they're --

4 MR. BARTON: Okay. I didn't see it in  
5 the current documents in D.

6 MR. LEE: Yes. We will check that. One  
7 of the things that we have is GALL is not a scoping  
8 document. So if it is not in GALL, then the  
9 applicant had to address it on a plant-specific  
10 basis. It was in fact within the scope, last we  
11 knew, for that plant.

12 MR. GRIMES: This is Chris Grimes.

13 MR. BARTON: I'm not comfortable with  
14 that answer.

15 MR. GRIMES: This is Chris Grimes.  
16 Sam's explanation is that GALL tries to treat all  
17 systems, structures, and components in a very broad  
18 way.

19 MR. BARTON: Right.

20 MR. GRIMES: And so my expectation is  
21 that somewhere that's an explanation on the  
22 treatment of receivers in an air-handling system.

23 MR. BARTON: Okay.

24 MR. GRIMES: Correct? And a compressed  
25 air system. And so even though it might be

**NEAL R. GROSS**

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

1 difficult to find, we would expect that somewhere  
2 there's an explanation and we'll research that.

3 MR. BARTON: Thank you, Chris.

4 Chapter VIII, steam and power conversion  
5 systems. In 8.E, you talk about a condensate system  
6 and you refer to condensate storage tanks, and  
7 material mentioned in that section only deals with  
8 carbon steel condensate storage tanks. My question  
9 is: what about plants that have aluminum condensate  
10 storage tanks? Where are they covered?

11 I know you've got to care about aluminum  
12 storage tanks because I have personal experience  
13 that the bottoms rot out. And I don't see that  
14 covered any place.

15 MR. DAVIS: I don't think we covered  
16 that, but I could check into that, too.

17 MR. BARTON: Well, I think you need to  
18 look at that.

19 CHAIRMAN BONACA: That's an important  
20 point.

21 MR. GRIMES: I know we can find  
22 receivers, but we may have to confess that aluminum  
23 storage tanks would be treated on a plant-specific  
24 basis until we've got some further experience with  
25 them.

**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 MR. BARTON: I know one place where  
2 you've got some real experience with them.

3 MS. RICO: And then, as for the SRP,  
4 your comment earlier about Section 3.3 on the -- in  
5 parentheses at the beginning of I think it's 3.3.2.6  
6 and 8, the program no longer is in use. That was --  
7 I had tried to keep the numbering system the same.

8 So like when you encountered earlier  
9 when something -- a program went missing from one  
10 version to the next, that was kind of my way of  
11 making it so that you knew what happened to this  
12 program, that it just didn't disappear off the face  
13 of the earth. But we will end up just taking those  
14 out and just renumbering them. But that explains  
15 why that is in there.

16 CHAIRMAN BONACA: Okay. Just pursuing  
17 again the issue that John Barton brought up. You  
18 may have, in fact, some components out there which  
19 are not covered by the current guidance. Aluminum  
20 storage tanks appear to be some of those.

21 In those cases, you will have an  
22 expectation that there will be a plant-specific  
23 program addressing the material, the environment,  
24 and the aging effects.

25 MR. GRIMES: That's correct.

**NEAL R. GROSS**

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

1 CHAIRMAN BONACA: Okay.

2 MR. GRIMES: We tried to treat -- GALL  
3 attempted to catalog everything we've been able to  
4 find so far. And I'm -- I'm sure you'll be able to  
5 think of other examples of unique component  
6 environment configurations that perhaps we haven't  
7 treated, and they simply didn't come up in the  
8 process of our cataloguing. That does not relieve  
9 the applicant from the responsibility of capturing  
10 them in scope and then treating the applicable aging  
11 effects.

12 CHAIRMAN BONACA: I imagine that at a  
13 later time will be included in GALL as lessons  
14 learned?

15 MR. GRIMES: That's correct. As a  
16 matter of fact, it's the -- industry has stressed  
17 the importance of their expectation that as future  
18 lessons are learned that there will be an  
19 opportunity to further improve the guidance.

20 CHAIRMAN BONACA: Yes. I have a general  
21 question about GALL. I can ask it anytime, so I'll  
22 ask it now. Which is, you know, GALL provides a  
23 real baseline and really gives a lot of comfort when  
24 you look at it, because although things may have  
25 been missed, but there is a significant meeting of

**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 the industry and the NRC and the whole experiences  
2 brought there.

3 And I'm still surprised at some of the  
4 applications, including the one we are going to see  
5 tomorrow, and the SCRs contain very little reference  
6 to GALL. I'm sure GALL has been extensively used to  
7 make judgments, and, you know, I was surprised that,  
8 for example, in the SCR we are going to review  
9 tomorrow there is very little reference to GALL.

10 And I just -- with respect to time,  
11 there will be more of that because, again, a  
12 reference to GALL is something that says -- like it  
13 is there and is acceptable and will be helpful.

14 MR. GRIMES: The simplest explanation is  
15 that we have a pact, and that pact is that so long  
16 as GALL is still evolving, and it does not represent  
17 an approved tool, then it will be used carefully by  
18 both the industry and the NRC. And so the lack of  
19 approval on the document means that we use very  
20 carefully, and we do not reference it -- either the  
21 applicants or the NRC -- until it has reached a  
22 stage of maturity and approval that we can say it is  
23 now an official agency document that can be  
24 referenced.

25 The fundamental objective of this

**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 demonstration project that the industry has  
2 undertaken is to find ways to maximize the utility  
3 of GALL as a reference in order to simplify the  
4 process. The staff is similarly motivated to be  
5 able to reference GALL as a device that represents  
6 an official position relative to these matters.

7 And we're here today to seek your  
8 endorsement, in your capacity as an advisory  
9 committee to the Commission, to get the Commission  
10 to put a blessing on it that makes it an official  
11 document that can be referenced.

12 CHAIRMAN BONACA: And I understand and  
13 that's great, because it lessens my concern. I  
14 think with the time I will expect and hope that  
15 there will be much more reference, you know, when it  
16 is a finalized document. But, still, right now --  
17 for example, I notice many requests for additional  
18 information where you went back and forth, and then  
19 finally the answer was, "Well, we did this because  
20 that's in GALL." And the staff responded by saying,  
21 "Ah, great. So we accept it."

22 I mean, so still now, already now, GALL  
23 represents a significant baselining for discussion  
24 and agreement. And so, okay, I understand it is not  
25 final yet. Is this going to be -- is this supposed

**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 to be the last draft we get before it is approved in  
2 the final form?

3 MR. GRIMES: We're going to talk about  
4 that at the conclusion of meeting.

5 CHAIRMAN BONACA: Okay. Because I'm  
6 beginning to wonder now. We don't --

7 MR. GRIMES: We would like this to be  
8 the last draft before we go to the Commission for  
9 approval to proceed and use it as an official  
10 position. But as you've pointed out, there's still  
11 some room for further improvements, and I hope that  
12 at the conclusion of the meeting we can convince you  
13 that, as we've tried to convince the industry, that  
14 the dialogue will continue and opportunities for  
15 future improvements will be there for subsequent  
16 revisions and additions.

17 We would like this to be the final  
18 draft, so that we can take this guidance to the  
19 Commission for approval.

20 CHAIRMAN BONACA: How does the industry  
21 feel about that? Because I see a lot of issues here  
22 which are continued dialogue items.

23 MR. GRIMES: I think that the -- well,  
24 I'll let the industry speak for itself when they  
25 come up to talk about their contribution with

**NEAL R. GROSS**

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

1 Revision 3 to NEI 95-10. But I think that the  
2 industry is as anxious as we are to take advantage  
3 of what's been accomplished so far, which we think  
4 is fairly substantial.

5 If you'll, you know, keep in perspective  
6 that we're here explaining a resolution of what we  
7 consider to be some of the key controversies that  
8 came up in the comments. But we've incorporated the  
9 results of about 1,000 comments for which we've very  
10 carefully gone through and documented in the  
11 companion NUREG report how we've treated each of the  
12 comments.

13 CHAIRMAN BONACA: Thank you.

14 MS. RICO: Now S.K. Mitra will come up  
15 and discuss Chapter VI.

16 MR. LEE: I guess before S.K. comes up,  
17 Dr. Leitch before had a question on the fatigue,  
18 environmental effects on fatigue. I have John Fair  
19 from the NRR staff. He can answer your question if  
20 you still have a question on that. This is, I  
21 guess, SRP 4.3.

22 MEMBER LEITCH: Yes, that's where my  
23 question was. I guess my question specifically  
24 related to the verbiage on -- I'm referring to the  
25 SRP now, page 4.3-2 and 4.3-3, speaking about the

**NEAL R. GROSS**

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

1 resolution of the generic safety issue and the  
2 statement that the effects of reactor coolant  
3 environment on the fatigue life of components were  
4 not adequately addressed in the code of record;  
5 particularly, the concluding paragraph indicates the  
6 potential for an increase in the frequency of pipe  
7 leaks as plant continues to operate.

8 That is speaking now about the  
9 conclusion of paragraph 4.3.1.2. Thus, the staff  
10 concluded that licensees are to address the effects  
11 of coolant environment on component fatigue life as  
12 aging management programs are formulated in support  
13 of license renewal.

14 MR. GRIMES: This is Chris Grimes. I'd  
15 like to introduce John's explanation by making --  
16 closing the circle in terms of the -- the associated  
17 generic safety issue is GSI 190. It was the issue  
18 that was intended to extend from GSI 168 on fatigue  
19 environmental effects for 40 years.

20 And what you read was the conclusion of  
21 GSI 190, and actually I think it's also important to  
22 recognize that even though the industry did not  
23 specifically identify this as a potential appeal  
24 issue warranting further dialogue, I think it is  
25 their expectation that this is an issue that has an

**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 ongoing dialogue that will continue in the future  
2 and may result in future changes to this guidance.

3 But with that, I'll let John explain the  
4 details.

5 MR. FAIR: Yes. I'm sorry. I'm John  
6 Fair with NRR. I missed the crux of the question  
7 you had on this.

8 MEMBER LEITCH: Well, it just left me  
9 with an unsettled feeling. I guess someplace in  
10 here, I'm not sure I can find the sentence right  
11 now, but it seems like -- I had the impression that  
12 40 years was kind of at the margin. And on that  
13 basis, I was wondering how we could proceed with 60  
14 years.

15 MR. FAIR: Okay. Originally, this issue  
16 was looked at for both 40 and 60 years, and we had  
17 an evaluation of a sample of components at a number  
18 of powerplants. And what we found, that in most  
19 plants we could do an evaluation, remove  
20 conservatism with the new environmental curves and  
21 show they were okay for most of the locations.

22 But in addition to the evaluation of  
23 these locations, we also had an auxiliary risk  
24 assessment, and it showed that the risk was not  
25 significant. And, therefore, we couldn't justify

**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 the backfit to the current operating plants.

2 So the basis -- the real basis of why we  
3 didn't have a problem with current operating plants  
4 was, one, we did an evaluation of high fatigue usage  
5 factors at most of these -- at a sample of plants,  
6 showed most of the locations were acceptable even  
7 considering environment for the 40 years.

8 There are some cases we couldn't show it  
9 was good for 40 years, but we suspect that with more  
10 detailed information, which the licensee has  
11 available to them, they could probably show these  
12 other locations were okay for 40 years.

13 And, in addition, we had the risk  
14 assessment showing it was not risk-significant  
15 enough to warrant a backfit. When we made the  
16 conclusion for 60 years, we said there's a  
17 likelihood that we'd have more problems at 60 years,  
18 obviously, with 20 years additional time. It would  
19 be more difficult to show that these locations were  
20 acceptable.

21 And we did a follow-on risk assessment  
22 in this GSI 190, and that follow-on risk assessment  
23 showed that there was an increase in leakage  
24 potential for these locations, even though the risk  
25 was not high. And on that basis, we concluded we

**NEAL R. GROSS**

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

1 should do something for license renewal because of  
2 the potential for increased leakages.

3 So it was basically we couldn't justify  
4 a backfit to the current operating plants based on  
5 the risk assessment and the evaluation we had  
6 performed. So --

7 MR. GRIMES: I would like -- if I could,  
8 I need to correct a misstatement I made before, that  
9 the precedent to GSI 190 was GSI 166, not 168. And  
10 I'd like to add that although we cannot backfit the  
11 design of all the fatigue analysis, we're  
12 approaching this from the standpoint of the  
13 environment is an aging -- is applicable to the  
14 aging effects associated with the fatigue analysis.

15 Therefore, we believe that it's within  
16 the scope of the renewed license to address how that  
17 affect is going to be treated. And John prepared  
18 the guidance for the Generic Aging Lessons Learned  
19 Report that explains our expectation on how that  
20 will be treated.

21 MEMBER LEITCH: Okay. I guess -- is  
22 that found -- that most of the locations would have  
23 a CUF of less than the ASME code limit of one for 40  
24 years. I guess that's the troubling statement, I  
25 guess, that I -- I'm trying to find the right

**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 sentence here. Just bear with me a second here.

2 I guess at one point here it says,  
3 "However, because the staff was less certain that  
4 sufficient excessive conservatisms in the original  
5 fatigue calculations could be removed to account for  
6 an additional 20 years of operation for renewal, the  
7 staff recommended in SECY" -- number such -- "that  
8 samples should be evaluated considering  
9 environmental effects for license renewal."

10 So I guess maybe I'm just not sure what  
11 you have done as far as this issue is concerned. Is  
12 additional inspection required or --

13 MR. FAIR: No. In license renewal for  
14 the plants that have gone through license renewal  
15 thus far, they have taken the locations that we  
16 originally studied --

17 MEMBER LEITCH: Okay.

18 MR. FAIR: -- the six locations, and  
19 they've done their own assessment considering  
20 environmental effects. And in most cases -- again,  
21 in most cases, not all cases, they are able to show  
22 there's not a problem. For the cases where there's  
23 a concern, which right now it looks like mostly a  
24 concern on the surge line, they're going to do some  
25 monitoring in the extended period of operation.

**NEAL R. GROSS**

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

(202) 234-4433

www.nealrgross.com

1 MEMBER LEITCH: Okay. Okay. I think  
2 that answers my question. Thank you.

3 MR. KUO: If I may add, the fatigue  
4 program that I was talking about earlier in Chapter  
5 X is in Chapter X, M1. The program is M1.

6 MEMBER LEITCH: M1?

7 MR. KUO: Yes.

8 MEMBER LEITCH: Thank you.

9 MR. KUO: You're welcome.

10 MR. MITRA: I'm S.K. Mitra again,  
11 Project Manager, License Renewal. With me today, on  
12 my right, is Bob Lofaro from Brookhaven National  
13 Lab; and on my left, Mr. Jit Vora from Office of  
14 Research; and Paul Shemanski from NRR.

15 Today's topic is Chapter VI, Electrical,  
16 and we are going to talk about the changes from the  
17 August version due to the public comments.

18 The first bullet is consolidated boric  
19 acid corrosion programs. The borated water leakage  
20 surveillance for a non-acute electrical connectors  
21 program, E.4. Used to be 11.E.4. Deleted from  
22 Chapter XI to eliminate the redundancy with the  
23 boric acid corrosion program in Chapter XI, Intent,  
24 which is now reference for electrical improvement  
25 also.

**NEAL R. GROSS**

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

1 This is based on industry suggestions.  
2 So we took that 11.E.4 out from programs and  
3 reference to 11.M.10, which is --

4 MR. BARTON: Reference to 11 what?

5 MR. MITRA: 11.M.10.

6 MR. BARTON: M.10?

7 MR. MITRA: Yes. That's boric acid  
8 corrosion program.

9 MR. BARTON: Yes.

10 MR. MITRA: Next bullet is we  
11 incorporated examples of specific insulation tests  
12 for medium voltage cables. Aging management program  
13 in 11.E.3, for medium voltage cable exposed to  
14 significant moisture and significant warpage, was  
15 modified to include example of acceptable monitoring  
16 tests to provide an indication of the condition of  
17 conductor insulation.

18 Based on comment, ACRS has three  
19 changes, and there will be a new paragraph in  
20 11.E.3, which will give the specific test. It says  
21 the specific type of test performed will be  
22 determined prior to the initial test, and this will  
23 be a proven test for detecting the duration of  
24 insulation system due to weighting, such as power  
25 factor, discharge, or polarization index, as

**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 described in EPRI TR203834-B1-2. Or other testing  
2 that is state of the art at the time of the test is  
3 performed.

4 MEMBER UHRIG: This, then, is very  
5 different than the -- this is not the same kind of  
6 test -- accelerated testing that was done for the  
7 low voltage cables.

8 MR. MITRA: No.

9 MEMBER UHRIG: This is just for normal  
10 usage.

11 MR. MITRA: Used for medium voltage.

12 MEMBER UHRIG: Yes. Medium voltage is  
13 for normal usage --

14 MR. MITRA: Yes.

15 MEMBER UHRIG: -- throughout the 60  
16 years.

17 MR. MITRA: Right. But --

18 MR. LOFARO: That's correct.

19 MR. MITRA: The last bullet is we added  
20 a sentence for first inspection/test of cables to be  
21 completed prior to the period of extended operation.  
22 And this requirement was added to the aging  
23 management program 11.E.1, E.2, and E.3, to the  
24 detection of aging effects, to make sure a 10-year  
25 inspection or test frequency will provide at least

**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 two data points during 20 years period, which can be  
2 used to characterize that degradation rate. This  
3 was also added to be consistent with the requirement  
4 in the SRP.

5 CHAIRMAN BONACA: This is typically --  
6 these are known EQ cables, right?

7 MR. MITRA: Yes.

8 MEMBER UHRIG: There are the medium  
9 voltage cables?

10 MR. MITRA: Any cable.

11 MEMBER UHRIG: Any cable.

12 MR. MITRA: Yes.

13 MEMBER UHRIG: Any cable, low, medium,  
14 or high.

15 MR. MITRA: Yes. And previously in GALL  
16 we didn't have this requirement saying that it had  
17 to be done at the completion of the period of  
18 extended operation. So it could have been done in  
19 50 years and only one inspection, and that would  
20 have been all data points, more than one. So this  
21 was added at 40. Any time before 40 is here, and  
22 then there will be one more.

23 MEMBER UHRIG: You have not specified  
24 any specific test. That's just the measure test for  
25 --

**NEAL R. GROSS**

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

1 MR. MITRA: Any specific tests?

2 MR. SHEMANSKI: Would you repeat that,  
3 please?

4 MEMBER UHRIG: Well, it says just --  
5 first inspection/test. You have not indicated the  
6 type of test. Is this negotiated with the utility  
7 at the time, or is this something that is -- they  
8 propose and you approve? Or is this something that  
9 is currently in use? What type of test are you  
10 talking about here? is really my -- I guess the  
11 question.

12 MR. SHEMANSKI: Basically, what we're  
13 looking for is a state-of-the-art test. We don't  
14 want to define the test right now, or at least the  
15 utilities, so that -- they would prefer to wait  
16 until the actual test is going to be performed and  
17 see what is the best test available at that point in  
18 time.

19 They were concerned about locking into a  
20 particular test right now, committing to a  
21 particular test, and if they chose not to do that  
22 test then they would have to come in for a license  
23 amendment type change. So what we agreed to was  
24 that just prior to the conduct of the test the  
25 utility would come in and discuss it with us, and

**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 NRC would then have the opportunity to agree or  
2 disagree with the type of test to be conducted.

3 MEMBER UHRIG: Also, assume that there  
4 would be a discussion of the criteria for acceptance  
5 or --

6 MR. SHEMANSKI: Yes. At that point,  
7 that would give us an opportunity to discuss the  
8 acceptance criteria that would be involved for that  
9 particular test.

10 MEMBER LEITCH: Just back to the first  
11 bullet, boric acid corrosion programs -- I'm looking  
12 at M.10, boric acid corrosion, and it doesn't leap  
13 off the page, to me at least, that it's referring to  
14 electrical equipment. It says the program covers  
15 any carbon steel, alloy steel structures and  
16 components which have borated -- one which borated  
17 reactor water may leak.

18 So where is -- I mean, it says  
19 "components," and I guess you could infer from that  
20 electrical.

21 MR. MITRA: Yes.

22 MEMBER LEITCH: And these seem to --

23 MR. MITRA: Specifically, it was  
24 mentioned and, regretfully, it has not showed up in  
25 your version. But I was told that it was

**NEAL R. GROSS**

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

1 incorporated in a later version.

2 MR. LOFARO: Yes. This is Bob Lofaro  
3 from Brookhaven. Subsequent to this March version  
4 that you have reviewed, we did add some words to  
5 program M.10 to specifically call out the inspection  
6 of electrical components.

7 MEMBER LEITCH: Okay. That's good.  
8 It's probably inferred here, but it's not real clear  
9 right here. Thank you.

10 MR. MITRA: Are there any other  
11 questions? Thank you.

12 Next presenter is David Solorio.

13 MR. SOLORIO: Hi. My name is Dave  
14 Solorio, and to my right here is Omesh Chopra from  
15 the Argonne National Lab. I'm going to talk to you  
16 about three things today. First -- the first couple  
17 will go real quickly. I'm going to talk about Reg.  
18 Guide 1.188, and then I'm going to talk about NEI  
19 95-10, and then I'm going to put up a slide here  
20 that talks about one-time inspections that you all  
21 asked for.

22 Reg. Guide 1.188 proposes to endorse NEI  
23 95-10, Rev. 3, dated March 1st, without exception,  
24 because 95-10 provides acceptable methods for  
25 complying with the requirements of the license

**NEAL R. GROSS**

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

1 renewal rule.

2 Two changes were made to the reg. guide  
3 in response to public comments. First, guidance for  
4 submitting electronic submittals was added, and a  
5 note was added to clarify that if color drawings are  
6 used no essential information should be lost from  
7 printing them out in black and white, so -- for the  
8 benefit of the public who may not have access to  
9 color equipment.

10 MEMBER SHACK: Let me just ask a  
11 question. I was sort of -- you know, I was reading  
12 the BWRVIP POP Guide Reports, which I assume will be  
13 sometime referenced in the license renewal document.  
14 And there's a proprietary version and a non-  
15 proprietary version, and by the time you get to the  
16 non-proprietary version, which is what the public is  
17 going to see, there's nothing there.

18 I mean, even the list of inspections  
19 that are proposed is proprietary and disappears. Is  
20 there some judgment here as to, you know, what's a  
21 reasonable amount of information to be provided to  
22 the public when this is done?

23 MR. SOLORIO: Well, the NRC -- not in  
24 the reg. guide -- but the NRC does have a process  
25 for providing -- what's the right word? Proprietary

**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 information.

2 I guess it would have to be handled on a  
3 case-by-case basis, and it would be up to the  
4 project managers and the NRC managers to determine,  
5 you know, what appropriate information needed to be  
6 seen by the public, so that they had a fair shot of  
7 looking at what we're looking at. We have a  
8 process, and we would follow that process.

9 I really don't have any more --

10 MR. GRIMES: This is Chris Grimes. I  
11 was involved extensively in the dialogue with the --  
12 with EPRI and the BWR Owners Group to try and get  
13 them to provide us with more than a cover page and a  
14 table of contents in the non-proprietary version.  
15 There are standards, and there is a test on the  
16 proprietary -- proprietary nature, but it's not  
17 always clear.

18 MEMBER SHACK: Well, the one that  
19 disturbed me the most was the table which actually  
20 outlined the inspections that would be done, which  
21 would seem to me the thing that, you know, the  
22 public might well want to know.

23 MR. GRIMES: And we listened long and  
24 hard to the explanation about how the BWR Owners  
25 Group and EPRI considered that to be marketable

**NEAL R. GROSS**

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

1 material. And it is. And notwithstanding our  
2 desire to be able to disclose those details in  
3 public, the standard that we apply is whether or not  
4 there is a -- you know, a financial gain to be made  
5 in terms of its marketability. And --

6 MEMBER SHACK: That is the crucial test,  
7 then, is is it marketable material?

8 MR. GRIMES: That's correct. And I can  
9 recall when I -- when similar questions came up on  
10 Westinghouse topical reports many, many years ago,  
11 we were able to convince Westinghouse that "F equals  
12 MA" was not a marketable quantity for them. And  
13 sometimes it gets that ludicrous, but it -- but the  
14 test is that -- it gives the owner of the report an  
15 opportunity to protect their commercial materials.  
16 That's its intent.

17 That's why we have provisions for  
18 proprietary material and protection of confidential  
19 business information. And it does make our job much  
20 more difficult in terms of the transparency to the  
21 public.

22 CHAIRMAN BONACA: Doesn't it also  
23 involve, in fact, a decision on the part of the  
24 staff on whether or not the right of the public  
25 weights the marketable value of the application?

**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 MR. GRIMES: That's correct. But you  
2 will find, particularly I think in the BWRVIP,  
3 safety evaluation that we -- we've worked very hard  
4 to present safety evaluation findings that describe  
5 enough of the contents of the material in terms of  
6 what we relied on to come to a reasonable assurance  
7 finding, without disclosing the details that the --  
8 that the owners groups and EPRI want to market.

9 And I would also add that I'm -- I  
10 believe that there is presently a rule change  
11 underway for 2.790. That's 10 CFR 2.790, which  
12 embodies the requirement for proprietary  
13 withholding, that attempts to improve it, but it  
14 still will demand that the Commission offer an  
15 opportunity for that commercial business information  
16 to be protected.

17 That's not unique to the NRC either.  
18 All federal agencies are confronted with providing  
19 for the protection of confidential business  
20 information.

21 MEMBER SHACK: I mean, it just seems to  
22 me there is some conflict with, you know -- I mean,  
23 I don't see how the public could look at that  
24 proprietary version of that document and learn  
25 anything.

**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 MR. GRIMES: Well, the non-proprietary  
2 version.

3 MEMBER SHACK: The non-proprietary  
4 version.

5 MR. GRIMES: But there is -- there are  
6 processes by which interested members of the public  
7 can view proprietary material by -- through legal  
8 means, and that is to make, you know, some kind of  
9 contractual arrangement, so that they will not  
10 disclose that marketable material.

11 So if there is an interested public  
12 organization -- and as a matter of fact, I believe  
13 that Commissioner McGaffigan referred to it when the  
14 issue came up during the regulatory information  
15 conference when Ed Limon, you know, referred to his  
16 concerns about the availability of research  
17 information related to aging effects.

18 And there are ways that public interest  
19 groups can view the details, so long as they agree  
20 to the -- maintaining the confidence of the material  
21 that's being marketed. Okay?

22 MR. SOLORIO: My next transparency talks  
23 about NEI 95-10. As you're aware, Revision 2 was  
24 published back in August. You probably -- most of  
25 you probably saw it then. The staff reviewed

**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 Revision 2 and identified a number of items that  
2 needed to be changed to ensure consistency with the  
3 standard review plan and GALL.

4 The staff met with NEI in February to  
5 discuss these items, and NEI revised 95-10 and  
6 submitted Rev. 3 in March of this year. On this  
7 slide I've categorized -- or on this transparency  
8 I've categorized the nature of the changes into  
9 three areas.

10 First, there are what I would call  
11 consistency changes. For example, the staff  
12 requests that the table of contents in 95-10 agree  
13 with the statement of contents in the SRP to ensure  
14 a consistent format for future license renewal  
15 applications. Another example was that the staff  
16 requested NEI 95-10 include a discussion on top 10  
17 program elements for an aging management program,  
18 similar as provided in the standard review plan.

19 There was some additional guidance for  
20 the timing with which an applicant should address  
21 USIs and GSIs, in accordance with NUREG-0933. And,  
22 finally, a conforming change to address changes to  
23 the regulation involving the accident source term,  
24 50.67.

25 I also want to mention that in March --

**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 in their March 1st letter transmitting Rev. 3, NEI  
2 indicated to support the schedule to provide this  
3 document, along with the other documents the staff  
4 has provided to the ACRS by March 1st. They  
5 provided 95-10 without the benefit of industry  
6 review. Therefore, there was a possibility there  
7 could be changes.

8 In addition, there were a few items such  
9 as the severe accident mitigation guidelines that  
10 didn't get added to Revision 3 due to timing, but  
11 NEI intends to add that. NEI has informed me that  
12 they will be resubmitting Revision 3 very shortly,  
13 and when NEI does that the staff will review it to  
14 ensure our endorsement remains unchanged.

15 My next transparency here is in response  
16 to what I understand was a request by the  
17 subcommittee to see the one-time inspections for  
18 Calvert, Oconee, and GALL.

19 CHAIRMAN BONACA: Let me just explain to  
20 -- for the -- I made the request because we have  
21 seen the one-time inspections, and we saw a large  
22 number for Oconee, for example -- for Calvert  
23 Cliffs, actually. And they've gone down in number  
24 substantially to the point where Arkansas had very  
25 few.

**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 Now, that doesn't mean the issues have  
2 been all gone away, but there is other ways in which  
3 they have been accommodated. So, second, if I look  
4 at the Arkansas application and Hatch, the one-time  
5 inspection really represents the bulk of the new  
6 programs being presented -- I mean, in large part.  
7 And it's --

8 MR. SOLORIO: I'm not real familiar with  
9 Arkansas and Hatch, but --

10 CHAIRMAN BONACA: Well, that's at least  
11 what I see from them. And so they are important  
12 because earlier they represent that. So it would be  
13 good for us to understand, you know, where these  
14 one-time inspections are, why they have been  
15 decreasing with time, if you have any insight on  
16 that that would be very useful.

17 MR. SOLORIO: Well, just to tackle that  
18 right away, GALL frequently now requires a plant-  
19 specific aging management program be required. So  
20 that could mean a licensee might have a one-time  
21 inspection or a licensee might have an existing  
22 program. As long as there is something, that's what  
23 GALL is asking -- asking for.

24 So that could explain a big difference  
25 perhaps why you see a lot less for these other more

**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 recent applicants. Again, I'm not real sure about  
2 their particulars, but --

3 CHAIRMAN BONACA: Yes. One of the  
4 reasons may be that Oconee was presented -- one of  
5 the earlier applications, I don't remember which one  
6 -- no, actually, Calvert Cliffs -- was much more  
7 focused on component by component, system by system,  
8 so there were a lot of programs there, many more  
9 numerically, while for Oconee they were grouped  
10 into, you know, generic programs. So there are less  
11 in those.

12 But I think it would be good for us as  
13 we go forth in our review to understand the  
14 situation with the one-time inspections.

15 MR. SOLORIO: Okay. In this first  
16 column here, what I've tried to do is represent how  
17 these systems would be grouped in GALL. So that's  
18 why you see the groupings. That's what they are  
19 there. And then, to the right, I go across trying  
20 to label the individual systems.

21 I also want to caution anyone near  
22 license renewal that we're not saying that all of  
23 these systems are only inspected one time for aging.  
24 In fact, the majority of the cases there's an  
25 existing aging management program also looking at

**NEAL R. GROSS**

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

1 these systems. It's just a particular aspect that  
2 they chose to do a one-time inspection for.

3 I also want to add that GALL has  
4 consistently applied the lessons learned of Calvert  
5 and Oconee regarding one-time inspections. In fact,  
6 for these two plants, one-time inspections were  
7 incorporated into GALL, when appropriate, as a  
8 starting point back in '99.

9 In developing GALL we also had the  
10 experience of the national laboratories in helping  
11 us capture these one-time inspections and gained  
12 from their experience. And staff associated with  
13 the first license renewal reviews were involved in  
14 reviewing these one-time inspections that were  
15 incorporated into GALL.

16 GALL also had the benefit of two public  
17 -- two rounds of public comments, and the frequent  
18 outcome of public's participation in the GALL now  
19 specifies a plant-specific aging management program  
20 be proposed where Calvert or Oconee might have done  
21 a one-time inspection, to provide flexibility in  
22 case a licensee is already doing something as an  
23 existing program. That's really all we need.

24 A plant-specific aging management  
25 program could be a one-time inspection or an ongoing

**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 program. At a glance, there appear to be  
2 differences in the number of one-time inspections  
3 here on this viewgraph between GALL, Calvert, and  
4 Oconee. But there are a number of reasons to  
5 explain these differences.

6 First, there are plant-specific reasons,  
7 like Oconee has several features which were a little  
8 too unique to be included in GALL, and obviously  
9 were not applicable to Calvert, like the dam  
10 emergency power source and the safe shutdown  
11 facility structure, kind of some of the stuff I put  
12 down here.

13 MR. GRIMES: If I could, I'd like to  
14 clarify that dam emergency power supports as a  
15 hydroelectric dam.

16 (Laughter.)

17 It's spelled a little differently.

18 (Laughter.)

19 MR. SOLORIO: I apologize. Maybe the  
20 Oconee project manager would want to make that  
21 point.

22 Second, in many cases Calvert proposed  
23 one-time inspections without being asked by the  
24 staff. I mean, it was just part of their  
25 application when it walked in the door.

**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 Third, different names are used for some  
2 of the systems performing the same functions, like I  
3 know you'll never guess this, but LPSW and HPSW at  
4 Oconee mean fire protection.

5 Now I'd like to go over a few examples  
6 on this viewgraph to explain a little more detail  
7 what I have here. Starting at the top with the  
8 reactor coolant system-SBP -- that's small-bore  
9 piping -- all three require a one-time inspection.  
10 Moving on to reactor vessel internals -- can you all  
11 hear me okay? I'm not sure if I'm -- this mike is  
12 doing funny things.

13 For reactor vessel internals, because of  
14 component design, the staff required a one-time  
15 inspection for certain components at Calvert but did  
16 not for Oconee because of differences in component  
17 design. GALL requires a plant-specific evaluation  
18 of certain reactor vessel internals.

19 For steam generators, Calvert proposed a  
20 comprehensive program that included inspections of  
21 steam generator tube supports. Oconee, having a  
22 different steam generator design, having an existing  
23 steam generator program also, but proposed one-time  
24 inspections for some of its supports due to gamma  
25 radiation concerns. GALL requires a plant-specific

**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 evaluation.

2 Moving on to the pressurizer, Calvert is  
3 conducting a one-time inspection of susceptible  
4 cladding locations, and so is Oconee. GALL requires  
5 a plant-specific evaluation.

6 Those are all of the examples I have to  
7 go over, but, of course, you can ask more questions.  
8 But I want to conclude by saying GALL has  
9 consistently applied the lessons learned at Calvert  
10 and Oconee to adequately cover the subject of one-  
11 time inspections. While there appear to be some  
12 differences between Calvert, Oconee, and GALL, the  
13 differences were due to a plant-specific nature.

14 MR. GRIMES: I would like to add to that  
15 the most recent experience that we had with Arkansas  
16 I think emphasized the plant uniquenesses and the  
17 variability, because even on the first item where we  
18 were consistent between Calvert, Oconee, and GALL,  
19 on small-bore piping, for Arkansas it was inherent  
20 in their risk-informed in-service inspection  
21 program. And so it does not appear as a one-time  
22 inspection or even a separate issue. It was  
23 embodied in our conclusions relative to aging  
24 effects for the affected piping.

25 So as we went back and reflected on

**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 this, I derived considerable comfort from the  
2 relative consistency we see across this, because it  
3 seems to be easily explained in terms of the plant-  
4 specific differences and also the different  
5 approaches that the individual utilities took to  
6 address specific aspects of applicable aging  
7 effects.

8 MR. SOLORIO: And just for anyone who  
9 might not have noticed, on the next page I have a  
10 legend there so you can make sense of all of that,  
11 because there's a lot.

12 CHAIRMAN BONACA: Yes. I wasn't able to  
13 read it all, but that's okay. One of the reasons  
14 why I asked that question was because we discussed,  
15 you know, for other applications and for Arkansas.  
16 I have some questions regarding the project, and the  
17 projects that -- you know, I am not familiar about  
18 the other plants. I think that will be valuable  
19 information to convey to reviewers, because the --  
20 you learn a lot about other applications.

21 And then, for example, your logic for  
22 excluding this mobile piping from Arkansas as a one-  
23 time inspection escaped me. For the first time now  
24 I understood that. So that is important information  
25 that I think is good to keep in mind as we go forth

**NEAL R. GROSS**

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

1 in reviews.

2 MR. SOLORIO: But the explanation that  
3 Chris gave you for Arkansas I'm sure would be  
4 included in their SER. It's just probably hidden.  
5 One of the things I found in going through Oconee's  
6 was it was very hard to find an Oconee system like  
7 the Calvert system, or an Oconee system like a GALL  
8 system, because Oconee had -- you know, they don't  
9 call their CVCS CVCS. They call it something else.  
10 So that does make it difficult.

11 MR. GRIMES: We're challenged to try and  
12 come up with generic ways to explain license renewal  
13 in a plant-specific environment. There again,  
14 that's something that's not unique to license  
15 renewal. I think every safety evaluation is  
16 challenged to try and describe a safety evaluation  
17 basis for an individual plant in plain language.  
18 We're still learning how to do that.

19 CHAIRMAN BONACA: I just have a question  
20 regarding this table, the last one that you took  
21 out. You put it away so quickly. There's nothing  
22 wrong with it, right?

23 MR. SOLORIO: Oh, no, no.

24 CHAIRMAN BONACA: I just wanted to ask  
25 you a question.

**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 MR. BARTON: What's a depressing air  
2 system? Is that one that needs psychiatric help or  
3 what?

4 (Laughter.)

5 MR. SOLORIO: It has to do with their --  
6 I'm not sure what the right term -- their emergency  
7 power source, which is the dam. And I don't know  
8 any more particulars, but it's for that system, for  
9 the --

10 MR. BARTON: It's called a depressing  
11 air system?

12 MR. SOLORIO: Depressing air.

13 MR. BARTON: Okay.

14 CHAIRMAN BONACA: It's depressing for  
15 the people who read it. But anyway --

16 (Laughter.)

17 What about the -- why some of them are  
18 in bold letters and some are --

19 MR. SOLORIO: So you've got differences  
20 between A, B -- you know, when a new -- when I start  
21 a new letter, I do bold so I can quickly look  
22 through it and figure out where A or B was or --

23 CHAIRMAN BONACA: Okay. Thank you. Any  
24 other questions for Mr. Solorio?

25 MR. SOLORIO: Thanks.

**NEAL R. GROSS**

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

1 CHAIRMAN BONACA: Thank you.

2 MR. GRIMES: And I am compelled to point  
3 out that license renewal is right on time again. We  
4 are right on schedule.

5 CHAIRMAN BONACA: This is remarkable.

6 MR. GRIMES: That completes the staff's  
7 presentation. But before I conclude, the next  
8 agenda item is for NEI to describe the work that  
9 they've done to revise NEI 95-10.

10 MR. WALTERS: Good morning. My name is  
11 Doug Walters with Nuclear Energy Institute. I do  
12 have copies of my presentation. I'm not sure I have  
13 enough for people in the audience, but I wanted to  
14 chat with you today about the changes we're making  
15 to NEI 95-10, Rev. 3. Of course, it is the guidance  
16 for implementing the license renewal rule.

17 A couple of key elements to the  
18 guidance. First is I put up here including a  
19 reference to the GALL Report. Let me just spend a  
20 minute on that. We haven't completed all that work.  
21 As has been mentioned in previous presentations, we  
22 have a demonstration program that's underway. We  
23 have the Class -- we call it the Class of 2002, the  
24 applicants we expect to submit in 2002, working on a  
25 project that encompasses how they think they would

**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 use GALL in preparing their application.

2 Our schedule for that is to get some  
3 information to the staff by the end of April, and  
4 then have some dialogue with them, ultimately moving  
5 towards some agreements I think by -- in the June  
6 timeframe. And then at some point thereafter we  
7 would go back and update our guidance as we think we  
8 need to to reflect what comes out of that  
9 demonstration program.

10 So there are a number of changes  
11 actually that were identified that we need to make  
12 to NEI 95-10 that we deferred to this demonstration  
13 program.

14 The other key element of our guidance,  
15 though, is the standard application format and  
16 content, and that's in Chapter VI. It follows the  
17 format and content, or certainly the format in terms  
18 of table of contents of the standard review plan,  
19 and that's kind of where we see all this heading is  
20 that an application would probably reflect what you  
21 see in those tables in the standard review plan.  
22 And so we've got the standard application and format  
23 in our guidance.

24 A third key element, I believe, is what  
25 we call Appendix -- it's Appendix B to our document,

**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 but it's a table of components and commodity groups  
2 that are subject to an aging management review, and  
3 that's a good tool certainly for doing the screening  
4 once you've done scoping.

5 MR. BARTON: Can I ask you a question on  
6 Appendix B?

7 MR. WALTERS: Yes.

8 MR. BARTON: Going down the list of  
9 categories --

10 MR. WALTERS: Yes.

11 MR. BARTON: -- under "Structures," you  
12 have an intake canal. How do I inspect the Delaware  
13 River?

14 MR. WALTERS: How do I what?

15 MR. BARTON: What do I do with the  
16 Delaware River?

17 MR. WALTERS: I don't know.

18 MR. BARTON: That's my intake canal.  
19 What's included in the scope of this? You know,  
20 Cooper is on the Missouri River. What's the  
21 component that I do something with here?

22 MR. WALTERS: It's a structure, and it's  
23 -- I mean, in my way of thinking, it's the intake  
24 structure that sits at the river or whatever it is,  
25 where you --

**NEAL R. GROSS**

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

1 MR. BARTON: So you're talking about the  
2 intake structure.

3 MR. WALTERS: Yes.

4 MR. BARTON: How about the -- what's  
5 included in the intake structure?

6 MR. GRIMES: Let me attempt to explain.  
7 Our expectation is each plant knows what it relies  
8 on in the way of the structural elements, in order  
9 to achieve the intended function, and so the  
10 guidance that we've given to the staff is to focus  
11 on intended function.

12 If they've got a pipe that extends out  
13 into the middle of the river that's important to be  
14 able to draw water from a particular place at the  
15 point of the intake, then that would be revealed in  
16 the definition of the structure that's relied on to  
17 achieve the function.

18 I appreciate the question because --

19 MR. BARTON: I mean, it's so generic,  
20 Chris, that you -- you know, intake canal, you know,  
21 does it include a tunnel? Does it include the  
22 discharge portion of the structure?

23 MR. GRIMES: It may. The answer is it  
24 may.

25 MR. BARTON: It may.

**NEAL R. GROSS**

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

1 MR. GRIMES: And what we -- and what we  
2 struggle with is if we're too specific and too  
3 precise in trying to define the boundaries, then  
4 what we do is we abrogate the responsibility for the  
5 individual plant to go through and identify where --  
6 what the boundaries are.

7 At South Texas, they've got a very  
8 elaborate canal system. I would expect them to go  
9 out and, you know, go all the way to the end of the  
10 structure that's associated with being able to draw  
11 on the heat sink. But there we felt that we did not  
12 -- we didn't want to be so specific as to relieve  
13 the individual applicants from exercising their  
14 responsibility to find the extent of the structure.

15 And that's the -- the constant struggle  
16 that we had was give them enough guidance to know  
17 what the right thing to do is, but don't give them  
18 so much that you -- you know, you've gotten too  
19 focused and missed the point.

20 MR. BARTON: Okay. I understand what --

21 MR. WALTERS: Good explanation. And I  
22 would add to that that I think you need to look at  
23 the guidance in total. We do have language in  
24 Section 4 that talks about establishing the  
25 boundaries, and the expectation is that even though

**NEAL R. GROSS**

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

1 you identify it as intake structure you've got to go  
2 back and do that evaluation boundary review and  
3 identify what you mean by the intake structure.

4 MR. BARTON: Okay.

5 MR. WALTERS: Revision 3, I'll be brief  
6 on this. This is Revision 3 as we submitted it in  
7 -- I guess we submitted it in February. Again, we  
8 included this reference to GALL. We did add the PRA  
9 summary report and the EOPs to the table of  
10 potential information sources, but I will tell you  
11 we don't agree with that. We think those are beyond  
12 design basis, shouldn't be on the table, but the  
13 fact that the staff was going to include them in  
14 their guidance, it just made sense I guess for us to  
15 go ahead and include it.

16 We modified the table that Mr. Barton  
17 was just referring to. We've added -- I think in  
18 the electrical area, we've made some minor  
19 adjustments, and we have incorporated selected  
20 references. What that means is that you may be  
21 aware that over the last probably two or three years  
22 we've been working with the staff on a number of  
23 issues; fuses comes to mind.

24 And what we did is we actually created  
25 an Appendix C to the document, and we've included

**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 the letters from the staff back to the industry, so  
2 that the user of the document doesn't, you know, get  
3 confused if you will about, well, what was the staff  
4 position on that particular issue? And we've only  
5 included a couple of those, the ones that we thought  
6 were most significant, like fuses and consumables.

7 CHAIRMAN BONACA: Let me just make a  
8 comment about bullet number two. In part, we  
9 contributed to that, and we didn't intend to create  
10 any change to the rule.

11 MR. WALTERS: I understand.

12 CHAIRMAN BONACA: If that was the case,  
13 we recommended that. But I thought it was more in  
14 terms of -- well, I'll give you an example. We  
15 questioned for Arkansas the fact that the reactor  
16 vessel level measurement system is not in the scope.

17 Now, they presented some reasons which  
18 had to do with the fact that it is not used in any  
19 accident analysis, and so, therefore, it wasn't part  
20 of that. And also, this is under the Appendix B  
21 program. We accepted that answer.

22 But you may have an EOP that depends  
23 very importantly for some reason on that piece of  
24 instrumentation. And I think that it's only prudent  
25 for the applicant to look at it and see if it sees

**NEAL R. GROSS**

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

1 that, you know, clearly that -- the reactor vessel  
2 level measurement system cannot have any other  
3 function than a safety function. It is not defined  
4 as such maybe in 50.54.

5 But the applicant may consider it  
6 important enough because it relies so uniquely on  
7 that for some reason, okay, that the UP points out  
8 as an element that they would like to keep in. It  
9 doesn't change the rule, but I think --

10 MR. WALTERS: I understand.

11 CHAIRMAN BONACA: -- it's only prudent.  
12 That was the only intent. And, in fact, I think the  
13 -- even the table right now in the SRP is non-  
14 prescriptive. It says simply document that should  
15 be reviewed for --

16 MR. WALTERS: Correct.

17 CHAIRMAN BONACA: So --

18 MR. WALTERS: I agree. Mr. Solorio  
19 alluded to the fact that we may have additional  
20 changes, and I've identified at least the ones we --  
21 we would intend to submit as -- as enhancements, if  
22 you will, to Revision 3.

23 He talked about the drawings. This is  
24 an issue of licensees typically send in colored --  
25 marked up drawings in color. They need to be -- the

**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 color scheme needs to be such that if a member of  
2 the public wants to print it in black and white you  
3 don't lose the meaning on the drawings. So we've  
4 got guidance to address that issue.

5 We're looking at guidance to reflect  
6 when an aging effect really requires management, but  
7 I think, frankly, with what we're doing in the area  
8 of GALL this may go away. This was something that  
9 the industry felt they wanted to do, we needed to  
10 do, to be clear on when an aging effect requires  
11 management.

12 You've heard the words either it's  
13 plausible, significant, whatever. We wanted to try  
14 to put together some guidance to further define what  
15 those terms mean.

16 We included the SAMGs as potential  
17 information sources, and I would add that for the  
18 SAMGs or for that table in general, the 3.1-1 table  
19 that's got the potential information sources, we did  
20 put some text up front in Section 3 that reflects  
21 how we think that table ought to be used. And it  
22 kind of gets to your point, Chairman.

23 And, again, we've added some additional  
24 selected references. In this particular case, it's  
25 only one and it was the letter that we got from the

**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 staff on the use of FERC maintenance and inspection  
2 programs on dams, as an aging management program for  
3 dams.

4 In conclusion, on 95-10, we think  
5 certainly there would be changes needed in the  
6 future to reflect the lessons learned from this --  
7 the GALL demonstration, and certainly our goal is to  
8 continue to have the NRC endorse it without  
9 exception.

10 And that's all I really had on 95-10. I  
11 don't know if there's -- if you have any questions.

12 MR. BARTON: Yes. On your table 6.2-1,  
13 other plant-specific TLAAs --

14 MR. WALTERS: Yes.

15 MR. BARTON: -- you've got Appendix B  
16 and Appendix C as optional. Why optional? Is there  
17 a reason for why that's not --

18 MR. WALTERS: Appendix B I think is the  
19 programs appendix.

20 MR. BARTON: Right.

21 MR. WALTERS: And we're probably going  
22 to change that to not be optional. We're probably  
23 -- based on the -- that's one that is in the  
24 category of deferred until GALL demonstration is  
25 completed, because we need a repository for where we

**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 describe programs.

2 MR. BARTON: Right.

3 MR. WALTERS: But if it's credited in  
4 GALL, where does that show up? Should it be in the  
5 appendix, or is it up front where you talk about the  
6 component and the aging and you just say, "I have a  
7 program, boric acid corrosion, for example, and it  
8 meets the description of the program in GALL." So  
9 that's one that's deferred.

10 MR. BARTON: Okay. The other one is  
11 commodity groups.

12 MR. WALTERS: That's Appendix C.

13 MR. BARTON: Appendix C, yes.

14 MR. WALTERS: Right. Same issue. We  
15 need to see how we use commodities in the -- when we  
16 do the GALL work.

17 MR. BARTON: So it may or may not be  
18 optional.

19 MR. WALTERS: It may or may not be  
20 optional. It may come out all together.

21 MR. BARTON: Okay.

22 MR. GRIMES: Doug, if I could -- this is  
23 Chris Grimes. If I could ask, I think it might be  
24 helpful for the subcommittee if you were to describe  
25 what you consider to be the success expectation of

**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 the demonstration project.

2 MR. WALTERS: Okay. Well, what we  
3 expect is a couple of things, and let me say that  
4 there's one thing we don't expect. I think the work  
5 that a licensee is required to do per the rule to  
6 prepare and submit an application is not going to  
7 change significantly. It's still appropriate for  
8 the licensee to go back and look at components,  
9 materials, environments, do the aging management  
10 reviews.

11 The benefit, though, of GALL is when we  
12 get into the programs, and we look at existing  
13 programs that manage aging. And what we envision  
14 GALL to provide is the one-time evaluation by the  
15 staff of that program, and then we can say, you  
16 know, does it need to be looked at again?

17 And so it's a packaging issue, I think,  
18 in part for us. Once we do all this work on site,  
19 how can we now package it so that we're not  
20 describing the boric acid corrosion program every  
21 time we use it.

22 And I think for us success will be that  
23 we see an application that's kind of formatted like  
24 the SRP tables, and that if it's a program that's  
25 evaluated in GALL and no further evaluation is

**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 necessary, that's all we need to say. We don't go  
2 into any detail on the program.

3 Success will be understanding what level  
4 of detail we need to go into if it's a new program.  
5 Success will be understanding the level of detail we  
6 need to go into if it's a program that's evaluated  
7 in GALL. But maybe the way I implement it at my  
8 plant doesn't quite match the evaluation in GALL,  
9 and how do I write that up.

10 I think the biggest test or the success  
11 for us will be how quickly whatever we come up with  
12 gets through the review process by the staff and how  
13 many RAIs do we get. And so -- and as you may be  
14 aware, we're working with the staff in the RAI area.  
15 We've done some cataloging of the RAIs that were  
16 issued for ANO and Hatch, and we are going to  
17 continue to do that with subsequent reviews to see,  
18 you know, how are we doing, what are they  
19 accomplishing. Well, we have different categories,  
20 etcetera, etcetera, but I won't get into that.

21 But I think the -- you know, what we're  
22 looking for is preparing an application that gets  
23 through a review in a reasonable time with minimal  
24 RAIs. And I want to emphasize when I say that that  
25 that doesn't mean we're looking to reduce what we

**NEAL R. GROSS**

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

1 need to do as an industry, or as an individual  
2 licensee, to prepare the application. It's just  
3 that we now have these lessons learned, and we ought  
4 to be able to package the application in a way that  
5 gets through the process in a fairly timely manner.

6 CHAIRMAN BONACA: On the other hand, I  
7 agree with everything you said, but my -- I feel  
8 almost an urge to have the finalization of this  
9 document so we can begin to see some more standard  
10 formats coming in. And, essentially, that minimizes  
11 demonstration phase because if you commit to a GALL  
12 program, I mean, then you have no further need of  
13 explaining it.

14 But, for example, the issue of only  
15 listing in an application the results of the  
16 scoping/screening, rather than scoping as we saw for  
17 the first applications and then the screening and  
18 the outcome, that, to me, is one that generates RAIs  
19 rather than eliminate RAIs, because there is no way  
20 that the license -- the reviewer can effectively do  
21 his job without understanding where you started  
22 from.

23 So isn't it counterproductive not to  
24 have the initial list of the scoping as the first  
25 applicants did, and then the screening process by

**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 which you -- you don't even have to have an outcome.  
2 I mean, that goes into the FSAR addendum anyway.

3 MR. WALTERS: Well, our position on that  
4 is -- and I think it was stated -- the rule requires  
5 the licensee to provide the methodology. The  
6 discussion we've had -- the ongoing discussion with  
7 the staff is review the methodology, be comfortable  
8 with the methodology, and then the resulting list  
9 should not be too much of an issue.

10 There's no question that the applicant  
11 will have the list, but what we -- you know, we'd  
12 like to do is have the staff focus on the  
13 methodology. And once they're comfortable with that  
14 -- in fact, that's what they did on Calvert Cliffs.  
15 I mean, they looked at the methodology. They even  
16 wrote an SER. And so the resulting list you would I  
17 think conclude is probably the right list.

18 But we'll continue to work with the  
19 staff on that. I recognize that scoping is a bit of  
20 an issue, and I think -- I probably should know  
21 this. I believe what we've got in our guidance now  
22 is a suggestion that you, in fact, provide the list.

23 CHAIRMAN BONACA: I think -- you know, I  
24 think if the licensees can get over it, I mean, I  
25 think in the long run -- because, I mean, there are

**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 so many ways to skin the cat at the beginning when  
2 you do the scopings. The methodology is generally  
3 going to be acceptable.

4 If you look at the application we're  
5 going to see tomorrow, it's acceptable, but it  
6 doesn't provide the level of detail we saw for  
7 Arkansas, for example, where before Arkansas they  
8 had a quality program that was already founded on  
9 the questions of 50.54.

10 So in there you had an easy match, and  
11 you could progress through. For Hatch you couldn't  
12 do that. So it leaves, still, the reviewer in a  
13 quandary, and it forces the licensee to answer a lot  
14 of questions. And most of all it leaves a third  
15 party, like the ACRS, with a question that says,  
16 since there are so many questions, so many  
17 exceptions when the answer comes, you know, are we  
18 really confident about adequate assurance that the  
19 scoping is correct?

20 I mean, I'm sure that the work is okay,  
21 but you are left with a --

22 MR. WALTERS: I understand.

23 CHAIRMAN BONACA: -- sample it by  
24 yourself as a -- and I view myself as a member of  
25 the public in that sense.

**NEAL R. GROSS**

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

1 MR. WALTERS: I understand. And, like I  
2 said, I think we'll -- you know, we'll continue to  
3 work with the staff, but the fact is that the rule  
4 doesn't require it, and we ought to be focusing -- I  
5 mean, it seems to me that -- and I'm not convinced  
6 that the number of RAIs would be reduced. If you  
7 get the whole list, it's still the negative review  
8 or proving the negative that is the test.

9 So you provide the whole list. Now, why  
10 did you include these five systems that -- so I'm  
11 not convinced that -- and, frankly, I don't -- I'm  
12 not sure that we ought to be saying a good test here  
13 is the number of RAIs. But the rule doesn't require  
14 it. We're trying to get the staff to focus on the  
15 methodology, and we think that the list that flows  
16 from the methodology should provide reasonable  
17 assurance that everything was caught.

18 MEMBER LEITCH: Doug, could you say  
19 another word or two about the demonstration project  
20 that is scheduled? Who are the participants? What  
21 are you trying to do there?

22 MR. WALTERS: Yes. The schedule is --  
23 well, let me start with the participants are --  
24 really, it's the Class of '02. And I don't have  
25 that list in front of me. I'm sorry.

**NEAL R. GROSS**

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

1 MEMBER LEITCH: But it's those that are  
2 in the --

3 MR. WALTERS: They are participating now  
4 -- some are participating in more -- in more of the  
5 activities than others. But our goal is to make  
6 sure that that -- that the Class of '02 is satisfied  
7 with where we're headed, because the -- I think the  
8 agreement we have with the staff is that's really  
9 the -- where GALL will be applied is on those  
10 applications.

11 What we've done is we've taken a -- we  
12 made up a list of systems, structures, and  
13 components, and then programs, and we're going to  
14 work the combination of those in a number of  
15 different ways. One, we'll look at programs that  
16 are already evaluated in GALL where -- and let me  
17 caveat this by saying all this work is -- is real in  
18 the sense that, you know, the participants are using  
19 their programs. This is what they intend to put in  
20 their application. I mean, this is application work  
21 in progress.

22 So we'll look at a program that's  
23 evaluated in GALL where the applicant thinks, yes, I  
24 match the evaluation that's in GALL, and we'll write  
25 an application section. There will be other

**NEAL R. GROSS**

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

1 programs where the applicant feels that the program  
2 evaluation -- their program is the same program  
3 that's evaluated in GALL, but maybe there's kind of  
4 a mismatch in terms of how they implemented their  
5 program and the evaluation in GALL.

6 For example, GALL might say you have a  
7 monitoring and trending provision in that program,  
8 and this particular applicant does not have that.  
9 We're going to show how we would write that up. We  
10 feel like we would need to address that particular  
11 attribute for that particular plant.

12 Then, the third thing would be a new  
13 program or an inspection, not in GALL. We think we  
14 need to do it. We'd show how we would write that  
15 up. So, in essence, what we plan to give to the  
16 staff by the end of April are application sections  
17 that show these three -- these three scenarios, if  
18 you will.

19 What we need to work out with the staff  
20 is there are a lot of other things we're going to  
21 have available. For example, how do you treat an  
22 aging effect that's identified in Gall that you  
23 don't think you have or doesn't apply to your plant?  
24 How do you treat an aging effect that's not in GALL  
25 that you think is in your plant?

**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                   And we talked about that. I mean, we  
2                   have an obligation to -- you know, to put those in  
3                   the application. So we're going to try to test all  
4                   of those different possible scenarios, give that to  
5                   the staff, and then I'm not sure that we've -- we've  
6                   come to agreement on whether they would actually sit  
7                   down and write RAIs, which would be helpful, or  
8                   whether we'll have some dialogue up front and then  
9                   repackage the demo work, send it back in and then  
10                  get RAIs.

11                  But at the end of the day what we expect  
12                  to walk away with is an understanding of what an  
13                  application looks like using GALL and the -- and I  
14                  would say actually using the SRP, because the SRP is  
15                  the document that the staff will use. And we've had  
16                  this discussion with the staff, that GALL is not a  
17                  scoping document, etcetera, etcetera.

18                  So we will use GALL, but it's really,  
19                  you know, the SRP and GALL that we're looking at.  
20                  And at the end of the day, what we hope to end up  
21                  with is an understanding of how an application looks  
22                  using, you know, GALL and the SRP. And then, you  
23                  know, the applicants go off and finish their work  
24                  and submit the applications that, you know, reflect  
25                  whatever we come up with in talking to the staff.

**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 So --

2 MR. GRIMES: This is Chris Grimes. If I  
3 could add to that and clarify, first of all, with  
4 respect to -- Doug commented that the Class of '02  
5 is the first group for which GALL is going to apply.  
6 We intend to use GALL for the Class of '01, but the  
7 Class of '01 -- the plants that are coming in in  
8 June and July, their applications are essentially  
9 complete. They're going through peer reviews.  
10 They're prepping -- they're packaging the shipments  
11 to send them in.

12 That does not mean that there is less  
13 urgency in terms of keeping to the aggressive  
14 schedule to complete GALL, SRP, and reg. guide for  
15 the Class of '01. The Class of '02 is in the  
16 process right now of figuring out how to package the  
17 application. So they are the first customers of the  
18 maximum benefits of this guidance.

19 My expectation is that at the conclusion  
20 of whatever we agree is an appropriate demonstration  
21 effort, that we will not only be able to identify  
22 ways to improve the guidance on the contents of the  
23 application, but we would also be able to provide  
24 guidance in the standard review plan and in the  
25 inspection guidance that explains how to treat these

**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 commitments in an application relative to  
2 conformance with the GALL Report.

3 So I would expect to be able to expand  
4 on the guidance to the staff in terms of what is --  
5 what does it mean when they say, "We meet the GALL  
6 Report"? How far does that go? How is that  
7 supposed to be tested in a safety evaluation?

8 And then, also, we need to provide  
9 collateral explanations to the inspectors in terms  
10 of how to inspect the validity of the contents of  
11 the application in terms of how GALL is referenced.  
12 So I would expect it to complete -- a complete  
13 success for the demonstration project will be  
14 revisions that we would bring to the committee and  
15 say, "This is what we're going to do to enhance the  
16 guidance to make sure that we will all get the  
17 maximum benefit out of this catalogue."

18 MEMBER LEITCH: But isn't what you're  
19 developing essentially a more finely divided pseudo  
20 GALL Report? In other words, what I'm saying is  
21 suppose that half the plants in the Class of '02  
22 have some deviation from the GALL Report. Then, I  
23 guess wouldn't you really like to see a GALL section  
24 that applies to that half of the plants, and say,  
25 "This is an acceptable approach"?

**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 MR. WALTERS: Sure. We would. I don't  
2 know -- I think we would, and I think that's  
3 certainly something that may come out of the demo.  
4 But certainly we would be looking for, I guess as  
5 the Class of '01 and '02 go through the process --

6 MEMBER LEITCH: I mean, if there's just  
7 one plant that's an outlier, that --

8 MR. WALTERS: That's different. Right.

9 MEMBER LEITCH: -- do it on a plant-  
10 specific basis. But perhaps you identify --

11 MR. WALTERS: That's right.

12 MEMBER LEITCH: -- the plants --

13 MR. WALTERS: And I think we've  
14 understood that from day one on this, that I think  
15 the staff acknowledged that. And as we go through  
16 the process, we might find that we missed something,  
17 or, hey, everybody is taking credit for this  
18 program. We don't have that in GALL. Maybe we need  
19 to put that in GALL.

20 So we will be looking for those. Yes,  
21 that's a very good point.

22 MR. LEE: This is Sam Lee. I guess one  
23 of the presentations you heard earlier today was on  
24 the buried piping program. That's a good example  
25 where we have one program in GALL, but it turns out

**NEAL R. GROSS**

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

1 the -- I guess the first couple applicants, they  
2 actually developed something quite different. Okay?  
3 But it's quite generic, so we say, "Okay. That  
4 looks like a generic program. That's acceptable to  
5 staff." We actually added that in GALL.

6 And so I -- I foresee this process will  
7 continue. As we learn more, we will put more  
8 programs together.

9 MEMBER LEITCH: That's good. Thank you.

10 CHAIRMAN BONACA: I'd like maybe a  
11 judgment. Are we ready to finalize GALL and the  
12 SRP? I understand there is still some negotiation  
13 going on, but that will go on forever it seems to  
14 me.

15 (Laughter.)

16 MR. WALTERS: Yes. I believe we are  
17 ready. We're focusing a lot on open issues, which,  
18 you know, we identified five and there may be some  
19 others. But the flip side of that is there's an  
20 awful lot that's been agreed upon. We're anxious to  
21 get -- you know, get moving on using GALL. We're  
22 going to have issues that come up -- the small-bore  
23 pipe issue, for example. We need to continue to  
24 work on that.

25 But, yes, we're ready to go. We think

**NEAL R. GROSS**

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

1 it's the right thing to do at this point. And let  
2 me just say that I think while we do have  
3 differences -- and we both -- you know, the industry  
4 feels pretty strongly about some of these open  
5 issues, very strongly, probably more from a process  
6 standpoint or a regulatory standpoint than a  
7 technical standpoint.

8           However, I think that the process we  
9 used -- you know, the staff developing GALL, the  
10 opportunity for the industry to get together, the  
11 frequent meetings we've had, has been a big success  
12 in our view. It's worked very well. You know,  
13 we've had good meetings with the staff. We've  
14 gotten a lot of good insights from them, from the  
15 labs that they used.

16           And so I think, you know, based on all  
17 of that, we're ready to move. I think we're very  
18 comfortable with where we are.

19           CHAIRMAN BONACA: Is it your -- you said  
20 that you will comment on that, too.

21           MR. GRIMES: That's correct. If this is  
22 the appropriate time, I would say that I agree  
23 entirely with what Mr. Walters has characterized as  
24 where we are in the process. We afforded -- we know  
25 that the industry feels very strongly about the

**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 specific issues that are identified for future  
2 dialogue.

3 We feel very strongly, too, and we  
4 afforded the industry an opportunity to say let's  
5 stop the process right here and take these issues  
6 through appeal. And the industry agreed that this  
7 was something for which -- this isn't make it or  
8 break it; we'll keep talking.

9 And so we -- and I also want to echo  
10 what Doug explained as there has been a substantial  
11 amount of agreement in terms of the resolution of  
12 comments, clarification of treatment of aging  
13 effects for which we expect to see substantial  
14 benefits in the future reviews, and we all want to  
15 start seeing those benefits as soon as we possibly  
16 can.

17 The sooner that the Commission approves  
18 the improved renewal guidance -- and at this point I  
19 also want to mention -- but we recognize that there  
20 are other places where we could probably improve the  
21 guidance even further. I do not want you to leave  
22 the impression that we're bringing to you a product  
23 that's good enough not to be noticed as bad.

24 This is a product that we believe might  
25 not be world class yet, but it certainly represents

**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 an excellent level of effort for which we can remove  
2 some more repetition, we can clarify where some of  
3 the unplugged pieces might have gone.

4 We covered a lot of ground with this  
5 material, and we think it's ripe for the ACRS to  
6 endorse this product for Commission approval with  
7 the same recognition that the industry has that  
8 there is still some future fine-tuning that will  
9 improve its utility and its readability and its  
10 transparency to the public.

11 And we'll continue to work on those  
12 lofty expectations, with an expectation that we'll  
13 be able to get there in a few years, as additional  
14 lessons are learned, and as additional feedback is  
15 provided to add to some of the detail. But we  
16 believe that the product that we have right now is  
17 good to go, and we request your endorsement.

18 CHAIRMAN BONACA: And I would expect  
19 that, you know, the implementation of these  
20 documents in a final form, when they're used in the  
21 field it will also help resolve some of the open  
22 issues, because, I mean, we will be testing. And  
23 without it, it's going to be open forever, because  
24 the issues are not going to be completely closed.

25 MR. WALTERS: One of the lessons we

**NEAL R. GROSS**

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

1 learned, you know, early on when we changed the  
2 rule, we had a lot of good discussions with the  
3 staff, and they were philosophical in nature,  
4 "Here's how the rule should work." But the reality  
5 is it's not until you get a Calvert Cliffs to  
6 actually put pen to paper, and you submit it and  
7 people can exercise the process that you really, you  
8 know, identify where you need to perhaps make  
9 changes. And that's where I think we are with these  
10 guidance documents.

11 We've done a lot of talking. We've had  
12 a lot of good interactions. We now need to get on  
13 with the business of actually implementing it and  
14 applying them. Let's see how it goes, and then, you  
15 know, make changes as we think we need to.

16 CHAIRMAN BONACA: Good.

17 MR. GRIMES: Dr. Bonaca, I also want to  
18 point out that we've received a lot of good feedback  
19 during the meeting today as well. And there are  
20 some questions for which we owe you answers, and  
21 there are some commitments that I'm prepared to make  
22 in terms of things that we're going to put on the  
23 list for continued dialogue with the industry about  
24 future improvements to this guidance.

25 But we've got a fairly substantial

**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 package here that I'm ready to take to the  
2 publisher, and we have had an extensive consistency  
3 review with both of the labs participating, in order  
4 to make sure that we've gotten as much of the  
5 editorial improvement included without doing any  
6 damage. That is, we didn't allow the latitude for  
7 folks to go in and try and do any fine-tuning during  
8 that consistency review.

9 But we will continue to respond to  
10 particular questions and to gather material for the  
11 next round when we go for the first revision in this  
12 guidance -- in these guidance documents.

13 MR. BARTON: Okay. Chris, what's your  
14 date to go to Commission with this?

15 MR. GRIMES: It's scheduled to be  
16 delivered to the EDO on April 23rd for delivery to  
17 the Commission by April 30th.

18 MR. BARTON: Okay.

19 MR. GRIMES: The Commission meeting is  
20 scheduled for June 16th, I believe. 14th. The 16th  
21 is a Saturday. I keep trying to get them to move it  
22 to the 16th.

23 CHAIRMAN BONACA: Okay. Any more  
24 questions for Mr. Walters?

25 MR. WALTERS: Thank you. Thank you very

**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 much.

2 CHAIRMAN BONACA: Before we take a  
3 recess for lunch, in the afternoon we have the  
4 review of the BWRVIPs. But I would like to go  
5 around the table now and get -- see if there are any  
6 comments from members right now about the letter we  
7 will write. I think we should write a report on  
8 this issue.

9 My judgment is that we should encourage  
10 finalization of these documents at this time. I  
11 think that, you know, we already voiced in a  
12 previous letter recognition of the fact that there  
13 has been a significant effort here. This was a  
14 remarkable compendium of information in GALL, has  
15 been restructured and has been refocused, but hasn't  
16 certainly been degraded as improved probably.

17 The other thing that I think is  
18 remarkable, as we noted, was the level of  
19 collaboration between the industry and the staff  
20 that has made these documents quite effective. And  
21 it shows the importance that we begin to see  
22 application that makes reference to this baseline  
23 documentation which has been so substantial. And  
24 right now it's moot in the application.

25 So, you know, I will propose that we

**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 will have their recommendation in a letter, and I  
2 will appreciate from members other insights on  
3 whatever else you need to see in the letter.

4 John, maybe you have some thoughts?

5 MR. BARTON: Well, Mario, from my  
6 review, I think you are going to continue to have  
7 dialogue I think until you see more applications  
8 come in. You may have to change the -- I can see  
9 where you will have to change --

10 CHAIRMAN BONACA: At some point.

11 MR. BARTON: -- the document. But I  
12 think, you know, from the work that's been done to  
13 date, I don't have any problem supporting where they  
14 -- to go forward with where they are.

15 MEMBER FORD: I'm coming from a lack of  
16 experience, Mario, but my main concern was the  
17 document would not be so cast in concrete that it  
18 couldn't take into account unforeseen degradation.  
19 Now I understand that that is taken into account.

20 CHAIRMAN BONACA: Yes, it is.

21 MEMBER FORD: So from my lack of  
22 experience, yes, I would endorse it.

23 MEMBER KRESS: I would endorse it, too,  
24 Mario. I think it's going to be a continuous  
25 process of slight iterations, but I think it's at

**NEAL R. GROSS**

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

1 the point where we can let those take care of  
2 themselves.

3 CHAIRMAN BONACA: Yes, I think so.

4 Graham?

5 MEMBER LEITCH: I guess we are speaking  
6 now specifically about GALL, are we, as contrasted  
7 with the SRP and the --

8 CHAIRMAN BONACA: Well, the whole thing.

9 MEMBER LEITCH: The whole thing. Well,  
10 let me, first of all, say I have no problem  
11 endorsing GALL. It is, you know, one of those  
12 documents that's 99 percent -- maybe even a higher  
13 percentage than that -- satisfactory. And there is  
14 a few little things that are going on that still  
15 need further dialogue, and that will always be the  
16 case I think.

17 I mean, that will be going on for some  
18 considerable period of time. So I think it's -- the  
19 time is to endorse this and get on with it.

20 I do also think there are some -- if  
21 there are issues of disagreement, there are some  
22 caveats at the beginning of GALL, what GALL is and  
23 what GALL is not, that helps clarify that issue. I  
24 mean, GALL doesn't purport to be all-encompassing.  
25 There could --

**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 CHAIRMAN BONACA: Or the only solution.

2 MEMBER LEITCH: -- be systems not  
3 included in GALL. Conversely, there could be  
4 systems in GALL that are not required. And it also  
5 speaks about the plant has to ensure that programs  
6 that they actually have complies with the -- is in  
7 line with the program in GALL.

8 So with all those upfront discussions of  
9 what GALL really is, I have no problem with  
10 endorsing it.

11 Similarly, I'm not sure if we're talking  
12 about the standard review plan. I guess it's,  
13 similarly, in draft form, is it not? And I think --  
14 I guess -- yes, it is still a draft, and I think we  
15 probably need to get on with approving that draft.

16 And then, the last document that I  
17 believe is still in draft form is the Reg. Guide  
18 1.188, which endorses the NEI. But I think from  
19 what I heard there is still some -- some changes  
20 proposed in the NEI document. I think the reg.  
21 guide -- I think this has to get to a point where we  
22 say, "This is" -- that is, the NEI document has to  
23 say, "This is Revision X," and then this document,  
24 the reg. guide, has to say, "We endorse Revision X."

25 Because I think there are still some

**NEAL R. GROSS**

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

1 minor discrepancies between these two things. So I  
2 think the staff has to be clear with this reg. guide  
3 exactly what revision is being endorsed. But I  
4 think that should be pursued promptly. I don't see  
5 any reason why that can't happen right away.

6 MR. GRIMES: And I'd like to clarify, it  
7 is our intent to take this -- the draft regulatory  
8 guide, in its present form with its changes, along  
9 with NEI 95-10, Revision 3, in its final form. And  
10 Doug explained that they're looking at some final  
11 changes before they give us the package that we  
12 would refer to.

13 And Dave Solorio pointed out, we'll look  
14 at that final version to verify that they didn't  
15 make any changes that would undue our ability to  
16 endorse it without comment. But then, that whole  
17 package, along with the draft standard review plan  
18 and the draft SRP, is the package that we would  
19 intend to present to the Commission the end of  
20 April.

21 MEMBER LEITCH: Right. Okay.

22 MR. GRIMES: And we will inform you if  
23 there are any substantive changes beyond just trying  
24 to identify any typographical errors or missed  
25 connections, or things. But we don't intend on

**NEAL R. GROSS**

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

1 changing the substance any more than what we've  
2 described to you today.

3 MR. BARTON: You said the SRP and the  
4 standard review plan. Do you also mean the GALL?

5 MR. GRIMES: That's correct. The  
6 package consists of the regulatory guide and its  
7 connection to NEI 95-10, Revision 3, the standard  
8 review plan. And the standard review plan  
9 incorporates, by reference, GALL.

10 MR. BARTON: Right. Okay.

11 MR. GRIMES: And then, to complete the  
12 package as it's presented to the Commission, there  
13 is the NUREG report that explains the resolution of  
14 all the public comment, so that is folded in, but it  
15 is not guidance. It's part of the package.

16 CHAIRMAN BONACA: Bob?

17 MEMBER UHRIG: I support this.

18 CHAIRMAN BONACA: Bill?

19 MEMBER SHACK: No. I'm sure, you know,  
20 we'll continue to approve it, even on the small-bore  
21 piping. I like the ANO solution better than the  
22 staff's solution, and I hope everybody will take it  
23 as a precedent.

24 CHAIRMAN BONACA: But the process allows  
25 that right now, so --

**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 MEMBER SHACK: But as Chris said, I  
2 mean, you really can't use this until it becomes an  
3 official document and --

4 CHAIRMAN BONACA: Yes. And I think we  
5 should stress the fact that what we review today, it  
6 would be -- certainly make the reviewer's job much  
7 easier if there was a more substantial referencing  
8 to establish documents of guidance, and they are  
9 missing right now.

10 The other thing that we -- in the  
11 interim letter we wrote, we also wrote that it would  
12 be important to update these documents frequently.  
13 They sure don't reflect experience. So there is  
14 already opportunity for incorporating changes.

15 Before we recess, I would like to ask  
16 one more question. First of all, are there any  
17 other issues that you would like to see reflected in  
18 the letter?

19 MR. GRIMES: I have a question, Dr.  
20 Bonaca. And is there anything in particular you  
21 want us to prepare to present to the full committee?

22 CHAIRMAN BONACA: Yes, I -- yes. We  
23 foreclose that, however, because that may be an  
24 issue. I raised the issue of scoping because it's  
25 one that I've been reviewing specifically, and I'm

**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 still somewhat concerned about, you know, the lack  
2 of transparency in some reviews when -- when -- I  
3 mean, the early applications were transparent  
4 because there was a scoping process. All the  
5 components were there. Then, there was a screening  
6 going in saying, "Well, what are the functions?"  
7 Well, the function is not required, and it doesn't  
8 belong in license renewal. And you see the outcome.

9 Right now, what is going to be agreed to  
10 is only the outcome, which is going to be leaving  
11 the reviewer in -- not the staff, because they have  
12 the benefit of being able to go and audit -- it's  
13 going to leave certainly a reviewer like ACRS unable  
14 to make a judgment. I mean, we have to purely make  
15 a judgment based on process and staff statements.

16 So do you feel that that's an issue we  
17 should bring up or not?

18 MEMBER SHACK: It sounds as though they  
19 made it a legal issue. You know, again, I kind of  
20 surrender when they -- when they hit me with the  
21 OGC, I give up.

22 (Laughter.)

23 CHAIRMAN BONACA: Well, I mean, still,  
24 we've got to express an opinion, you know, because I  
25 think ultimately we want to make sure that these

**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 processes by which you are licensing these plants .  
2 are transparent the public. And, you know, I --  
3 again, I view ourselves as the public in a certain  
4 way. We are coming at the end of the process. We  
5 are less informed than the staff and the applicant,  
6 and we're trying to make sense out of what is being  
7 done. So --

8 MEMBER SHACK: Well, it certainly sounds  
9 as though we ought to encourage them to include it.

10 CHAIRMAN BONACA: Well, that would be  
11 the only way would be purely that, you know, we like  
12 it better one way or the other, simply not forcing  
13 away. I mean, what is being proposed is acceptable.  
14 I realize it meets the requirements of the rule.

15 MEMBER KRESS: I viewed our role as  
16 auditing the process, to see that the process would  
17 result in an acceptable product. So, personally, I  
18 think it's all right to do it. You know, we've  
19 already looked at the process, and we know that the  
20 staff is diligent about following such a process.  
21 So I really don't see that it needs to be that  
22 apparent.

23 CHAIRMAN BONACA: Let me try -- if I put  
24 anything in, I'll just put in a paragraph, and then  
25 I'll let you guys make a judgment, and then we can

**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 decide then. It certainly will be only in terms of  
2 expressing an opinion rather than giving a  
3 recommendation at this stage.

4 MR. BARTON: That's a good suggestion.

5 CHAIRMAN BONACA: All right. Now,  
6 regarding the meeting next week, I think that we  
7 don't want to go through the specifics, but it will  
8 be interesting to have a categorization by a generic  
9 type of changes. For example, some of them were  
10 repackaging. Some of them -- and we don't need to  
11 hear about the repackaging issues.

12 I mean, some of them were increase  
13 focus. Okay? Some of them were minimal acceptable  
14 programs. It will be interesting to understand, you  
15 know, the category of changes and a judgment of  
16 whether you see there has been any erosion of  
17 programs or not. I guess the judgment would be that  
18 there isn't, so -- but just the categorization of  
19 those, it would be interesting to hear for the  
20 committee. And then we'll decide how much time  
21 there is for this portion here.

22 The other thing that -- I can maybe  
23 provide some examples, give one example for each  
24 category, so we understand what the process of the  
25 change was.

**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           The other thing that I thought  
2 personally, and then we'll go around the table and  
3 see what other thoughts there are here, it would be  
4 to -- to talk about the one-time inspections. I  
5 know that some of the other members -- for example,  
6 Dr. Powers -- was interested in those, and I think  
7 it's important that we get an understanding of that.

8           And since we are going to have a  
9 presentation on Hatch on the same morning, it would  
10 be interesting to see, you know, specifically the  
11 one-time inspection for Hatch spelled out, so we can  
12 have a correlation between what we see in the  
13 morning --

14           MEMBER SHACK: Why don't we toss in ANO  
15 and complete --

16           CHAIRMAN BONACA: Well, see, but that's  
17 -- then we have an understanding how -- we  
18 understood, for example, the issue of small-bore  
19 piping.

20           MEMBER SHACK: But ANO is a very  
21 interesting contrast. I mean --

22           CHAIRMAN BONACA: Sure. I mean, but it  
23 raises questions, and there are good reasons. But I  
24 think that it would be good for the whole committee  
25 to hear it and to see the reasons why we're going

**NEAL R. GROSS**

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

1 from so many to so little. It doesn't mean that we  
2 are not doing it. It means that something else is  
3 taking care of that, particularly the ISI for the  
4 small-bore piping, which is risk-informed.

5 Any other issues you feel that we  
6 should --

7 MEMBER SHACK: Well, I think they ought  
8 to discuss the open issues.

9 CHAIRMAN BONACA: Yes.

10 MEMBER SHACK: Clarify those and flag  
11 those out. Again, there has to be some emphasis on  
12 the perspective here. You know, you have open  
13 issues, but, you know, really, you have resolved so  
14 much.

15 CHAIRMAN BONACA: And, of course, you  
16 want to communicate your recommendation that we  
17 recommend finalization of the documents.

18 Anything else? If not, then we'll take  
19 a recess for lunch. We'll meet again at 20 after  
20 1:00.

21 (Whereupon, at 12:21 p.m., the  
22 proceedings in the foregoing matter went  
23 off the record for a lunch break.)  
24  
25

**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)

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

(1:18 p.m.)

CHAIRMAN BONACA: We are resuming now with the BWRVIP reports and their applicability to license renewal. With that, I pass it to Mr. Carpenter.

MR. CARPENTER: Yes, sir. I'm Gene Carpenter. I'm with the Materials and Chemical Engineering Branch, and I'll be talking to you today about the BWRVIP reviews for license renewal.

The agenda that I'll be following is an overview of the BWRVIP program, which will be basically given by Robin Dyle of the Southern Nuclear/BWRVIP Assessment Chairman. Then I'll be talking about the staff's review of the BWRVIP reports with some overview of the current operating period, the generic aging management plan that we have looked at, the reports supporting the BWRVIP generic aging management program, and I'll be giving some specific examples of those, and then I'll be going to the conclusions.

Staff's perspective -- BWRVIP is a voluntary industry initiative that began in 1994 to address the Generic Letter 94-03, core shroud cracking issues. As you may recall, we briefed the

**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       ACRS on this some years ago about this issue and  
2       talked to you about it at that time.

3               Since then, it has grown to address all  
4       BWR internal components, reactor vessel, and Class I  
5       piping. It also covers the current operating term  
6       and the extended operating period, and it is  
7       proactively addressing aging degradation issues that  
8       are beyond regulatory requirements.

9               The staff has been reviewing the BWRVIP  
10       submittals, and that includes some 15 inspection  
11       flaw evaluation guidelines, which I'll be going over  
12       in some detail today; 13 repair and replacement  
13       design criteria guidelines; four crack growth and  
14       mitigation guidelines; 22 other supporting reports;  
15       and 12 license renewal appendices.

16              Now, point of information -- although  
17       there are 15 inspection flaw evaluation guidelines,  
18       three of them are subsumed into two others, so that  
19       is -- that takes care of that, and then with the 12  
20       license renewal appendices it makes up the aging  
21       management program.

22              The staff expects to finish the reviews  
23       of these documents listed by the end of this year,  
24       and this is, of course, dependent upon timeliness  
25       and technical review adequacies.

**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 Now, presentation is by Mr. Dyle. He's  
2 going to go over some of this. He's, as I said, the  
3 Technical Chair of the Assessment Committee.

4 Robin?

5 MR. DYLE: Thank you. I appreciate the  
6 opportunity to be here. As Gene said, my name is  
7 Robin Dyle. I'm from Southern Nuclear, and I'm  
8 currently the Assessment Chairman -- Assessment  
9 Committee Chairman.

10 Now I have a little bit about the  
11 organization. I consulted with Dr. Shack last week  
12 to try to understand --

13 MEMBER SHACK: He happened to be in  
14 Oregon.

15 (Laughter.)

16 MR. DYLE: We were -- I apologize. We  
17 were at Argonne last week, and I --

18 MEMBER SHACK: For rest and recreation.

19 MR. DYLE: Yes. And the question I  
20 asked was, who on ACRS heard our presentation seven  
21 years ago, and he basically said three people. So  
22 as Gene and I talked about how to describe this and  
23 the information we thought you might need, there is  
24 some programmatic information. And what I'd like to  
25 do is explain how the program was put together, the

**NEAL R. GROSS**

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

1 things that went into it, so that you understand,  
2 then, the depth and the breadth of the program and  
3 how the licensees are using it.

4 What I am using here is a boiled-down  
5 version of a six-hour class that we teach for the  
6 licensees. So some of these slides I will simply go  
7 through, but they're there for completeness, so that  
8 you can have them to refer to later.

9 Please stop me as I go on with any  
10 questions you have.

11 CHAIRMAN BONACA: Yes. At some point,  
12 whenever it's convenient, it would be probably good  
13 for us to have, if you have a little schematic --  
14 and I think you do have it -- a representation --

15 MR. DYLE: Yes.

16 CHAIRMAN BONACA: -- to give us just a  
17 brief schematic of the BWR internals, the function  
18 that some of these perform, like the shroud, and --

19 MR. DYLE: Top guide.

20 CHAIRMAN BONACA: Yes. And then the  
21 location of cracks that have been experienced to  
22 date, and also -- the other thing which is important  
23 to understand is not all kinds of cracks will cause  
24 safety consequences.

25 MR. DYLE: Right.

**NEAL R. GROSS**

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

1 CHAIRMAN BONACA: A few, however, have  
2 safety implications, and you could point to us which  
3 ones really -- you know, briefly, just so that we  
4 get an overview --

5 MR. DYLE: Okay.

6 CHAIRMAN BONACA: -- and I would see it  
7 as a cap to the whole package of the BWRVIP.

8 MR. DYLE: Okay.

9 CHAIRMAN BONACA: It will help us.

10 MR. DYLE: When I get to the point of  
11 doing the detailed discussion, I'll -- if I forget,  
12 stop and remind me and see if there's anything else  
13 that I failed to address.

14 CHAIRMAN BONACA: Okay.

15 MR. DYLE: Because I'm going to try to  
16 do a broad overview, and then I've got several  
17 components that we talk about in more detail, so you  
18 can see how the program is put together.

19 I'd also like to mention that Mr. Bob  
20 Carter is here sitting at the table. He is the EPRI  
21 task manager who has handled this program from an  
22 assessment standpoint since we began this effort.  
23 And we've got some of the I&E documents. Should you  
24 ask a question that we don't have in the  
25 presentation, we'll have that available.

**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           As I mentioned, the purpose of the  
2 presentation is to give you kind of an overview of  
3 where the VIP came from, look at the scope of the  
4 program and how and why we selected the components  
5 we did, because all the internals are not in there,  
6 and there's a reason for that.

7           We need to identify the attributes that  
8 ought to be part of, you know, what a plant does to  
9 make sure they do the things that are appropriate,  
10 and this would apply to license renewal. And then  
11 we'll talk about some of the guidelines.

12           And the detailed review that I have  
13 planned based on input from Gene was the flaw  
14 evaluation guidelines for the shroud, the jet pump,  
15 the top guide, and then a discussion of what we've  
16 done recently on IGSCC related to piping in the  
17 recirc. loop. So that will be the presentation.

18           From a historical perspective, back in  
19 the 1980s, IGSCC and piping was an issue. We were  
20 concerned with it. And we recognized that it could  
21 potentially affect internals and started working on  
22 that in the owners group.

23           The shroud cracking that occurred in '93  
24 and '94 provided additional evidence that we needed  
25 to address internals cracking in IGSCC. So, in

1 1994, the utility executives recognized that it was  
2 a big enough issue that they separated this issue  
3 from the owners group and formed the VIP as a stand-  
4 alone committee that would focus on the internals.  
5 So that was the purpose of this organization.

6 And here's the executive guidance that  
7 we had. We're to lead the industry toward a  
8 proactive generic solution. And what we did with  
9 that was one of the things that Bill Russell  
10 actually said he thought was a good thing we had  
11 done was we set aside the licensing arguments. We  
12 made no licensing arguments in the VIP. We did the  
13 technical thing first, described what the problem  
14 was, what the solution would be, and then after the  
15 fact tried to figure out how that fit into the  
16 licensing arena. So we were trying to do the right  
17 thing for the right reasons.

18 The other thing was to have options.  
19 Because we were looking at new things, we wanted a  
20 cost-effective approach. There might be one thing  
21 that one utility would want to do and another that a  
22 separate utility would like to do. But both were  
23 equally adequate in addressing the safety issue, so  
24 we tried to build that into the program.

25 We also served as the focal point to

**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 interact with the staff, and that has worked well.

2 And the last item is that we share  
3 information among the members. We've got the  
4 program set up so that periodically all the  
5 inspection information is funnelled back to the  
6 members. It's also given to the staff, so that we  
7 can keep this program a living program. If  
8 something new happens that we didn't anticipate,  
9 that's the vehicle to find out about it and modify  
10 the program as we go forward.

11 From a dollar standpoint, here is the  
12 issue. If you look -- and that doesn't come out  
13 very well in the colors. I apologize. But in the  
14 early '80s, this loss of capacity due to pipe  
15 cracking was a big issue. We're talking 12, 14, 20  
16 percent loss of capacity for the BWR fleet because  
17 of pipe cracking. We didn't want that to happen,  
18 and we've tried to manage the internals, and we  
19 think we've done so.

20 Here's our biggest loss of capacity  
21 related to internals cracking. So the other thing  
22 that this program did was let us manage the problem  
23 proactively, so we could continue to operate the  
24 plant safely and minimize the cost. To date, we've  
25 spent in excess of \$30 million on this program of

**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 utility funds to go forward.

2 The next slide is a list of the domestic  
3 plants. All of the domestic plants are in the  
4 program. I won't spend a lot of time. And the next  
5 slide simply is to let you know the international  
6 members.

7 The benefit of this is they've done  
8 things differently. In the early days of the shroud  
9 cracking, we wanted to understand better what the  
10 weld residual stresses might be. The Japanese had  
11 actually built a shroud using their old welding  
12 procedures and then done the destructive analysis of  
13 it. So by having them be a member, we were able to  
14 share that information and build that into our  
15 approach.

16 So that was one of the benefits of  
17 having the international folks, and they continue to  
18 be members and provide active support.

19 Here is the project scope, and the scope  
20 for the VIP initially was we'll take care of the  
21 vessel and the nozzle. So from the safe end weld  
22 out, that belonged to the owners group or some other  
23 activity. We focused on where we needed to be  
24 early.

25 We did a safety assessment, and I'll

**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 talk a little bit more about that in just a second,  
2 that helped us identify what needed to be done and  
3 when it needed to be done. And when it all boils  
4 out, these are the components that are included in  
5 the VIP program that are considered safety-related.

6 The other thing that we prepared -- and  
7 Gene mentioned those, and I did, too -- what we call  
8 I&E guidelines or inspection and flaw evaluation  
9 guidelines. There is this one, the I&E. This  
10 describes what and when to inspect, and this is done  
11 by the Assessment Committee.

12 You know, how is this component going to  
13 fail? Where is it going to fail? How often should  
14 I inspect it? What method should I use?

15 The NDE guidelines where we have the NDE  
16 experts working, they develop the qualification  
17 criteria. You know, how would you qualify a UT  
18 instrument to go down and do a shroud weld H4? So  
19 they work on that and look at the errors involved.

20 We develop repair guidelines because we  
21 anticipated having cracking and needs that -- where  
22 we would need to fix things. So they're done. And  
23 then mitigation hopefully offers the silver bullet  
24 for the future, to find ways to turn off the  
25 cracking through use of hydrogen water chemistry and

**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 noble metal.

2 Real quick, that's the organization and  
3 it's no longer current because I'm now the Technical  
4 Chairman here. But these are how we broke -- these  
5 represent the committees and the committee  
6 structure. This is how we broke the work up. And  
7 the other thing that was important was that we have  
8 an executive responsible for each section.

9 And you notice that we'll have an  
10 Executive Chair. Currently, Integration is open  
11 because of mergers and changes like that. We  
12 periodically have open slots. But the main thing to  
13 see is the structure, the organization, and that  
14 there is an executive leading each one of these  
15 technical committees. And that has been vital to  
16 making the program successful.

17 The next slide simply is a list of the  
18 Inspection Committee products or some of them, and  
19 we'll talk about a few of these. But this also  
20 gives you an overview of how we work the program  
21 together. We have the I&E guidelines, and then we  
22 have crack growth or fracture toughness reports, and  
23 they've been submitted to the staff. We've got one  
24 for stainless, one for nickel-based alloys, one for  
25 low-alloy steels. So those have been provided, and

**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 those provide additional support to the program.

2 Again, I'll talk about the safety  
3 assessment on the next few slides. Component  
4 configuration drawings, which we provided to the  
5 staff -- as we develop this program, we pull  
6 drawings from all available resources at GE for the  
7 as-designed structures. We save those, cut and  
8 pasted them, and put them into a document so that  
9 now each owner has a list of all the documents, has  
10 sketches that he can look to see if cracking occurs  
11 at one plant.

12 He can look and see what that  
13 configuration is, how it applies to his plant, and  
14 what actions he might need to take. And it's all  
15 readily available, and it's also here for the staff  
16 to use, so they can understand those same issues.

17 We've done some bounding assessments.  
18 This goes back as a follow-on to Generic Letter 92-  
19 01 looking at the vessel.

20 The effective IHSI, one of the issues  
21 that we dealt with -- and I'll talk about it when I  
22 get to the piping -- was the effectiveness of the  
23 induction heating stress improvement and how well  
24 that works in mitigating IGSCC. And it ties to the  
25 88-01, and I'll talk about that.

**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 Integrated surveillance -- I'll just say  
2 here that we're working on a program similar to  
3 that, I'd say, like the B&W plants have done in the  
4 past where we can get a smaller group of plants that  
5 have the right materials and integrate our overall  
6 surveillance program, so that we better understand  
7 what's going on with vessels and adjust the capsule  
8 withdrawal schedules. And that's under development  
9 right now.

10 The next two slides are simply a list of  
11 the I&E guidelines for these safety-related  
12 components, and I'll -- unless you have a question,  
13 I'll just go on past those.

14 MEMBER LEITCH: Would the nozzles be  
15 under the RPV?

16 MR. DYLE: Yes, sir.

17 MEMBER LEITCH: It seems to me there was  
18 a particular problem with the CRD return line  
19 nozzle. Was that return line eliminated in all  
20 plants? I know many of them it was.

21 MR. DYLE: No, sir. It was eliminated  
22 in all but two. The two BWR-2s did not cut and cap  
23 the CRD return lines. The rest of the plants did.  
24 And that's addressed in NUREG-0619 that addressed  
25 the feedwater nozzle cracking and the control rod

**NEAL R. GROSS**

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

1 drive return line. And then that, as it applies to  
2 license renewal, is addressed in BWRVIP 74, which is  
3 our vessel license renewal document. So that's  
4 where we brought that information forward.

5 MEMBER LEITCH: What are the two BWR-2s?  
6 Do you remember off hand? Is it Oyster Creek?

7 MR. DYLE: The BWR-2s would be Nine Mile  
8 1 and Oyster Creek.

9 MEMBER LEITCH: Thanks.

10 MEMBER FORD: You were going at such a  
11 rate that I didn't want to stop you.

12 MR. DYLE: That's fine.

13 MEMBER FORD: Back on page 8 --

14 MR. DYLE: Yes, sir.

15 MEMBER FORD: -- you listed the  
16 components there, and I'm presuming they're going in  
17 terms of priority from the core shroud down to the  
18 RPV as the bottom priority. What was the criteria  
19 for that risk assessment?

20 MR. DYLE: You're a wonderful strike  
21 man. The next slide, page 14 --

22 MEMBER FORD: Okay.

23 MR. DYLE: Couldn't have timed it  
24 better. Thank you, Dr. Ford.

25 For years we understood that there were

**NEAL R. GROSS**

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

1 some components that were safety-related and not.  
2 But when we started the VIP, we said, "Let's make  
3 sure. Let's revisit that issue. Let's go back to  
4 GE and talk about how this thing was designed and go  
5 from there."

6 So we said, "We're going to identify the  
7 safety-related components and separate them from the  
8 non-safety," and here's the criteria that we used  
9 when we looked at the components -- maintain a  
10 coolable geometry, rod insertion times, reactivity  
11 control, core cooling, and instrumentation  
12 availability. So all of those were considered in  
13 determining whether something was safety-related or  
14 not.

15 Some components, as it turned out, were  
16 not. The feedwater sparger sometimes is surprising,  
17 but it has no safety function. It disperses the  
18 water equally about the annulus, and it improves jet  
19 pump performance, but it is not relied on in any way  
20 for safe performance of the vessel or any ECCS  
21 function. So that's just an example of how we did  
22 that and how we separated those.

23 MEMBER KRESS: What exactly is a safety  
24 assessment, contrasted to a PRA, for example?

25 MR. DYLE: Oh. It was a deterministic

**NEAL R. GROSS**

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

1 assessment where we looked at the failures of the  
2 components, and I have that discussed later in VIP  
3 06. But we did a deterministic assessment, said,  
4 "What is this thing supposed to do?"

5 MEMBER KRESS: If it failed --

6 MR. DYLE: If it fails, what happens?  
7 What other systems are available? And given that  
8 those systems available, what happens if it fails?  
9 And so one of the things we found -- and we  
10 determined this when we did the core shroud  
11 initially and did the detailed safety assessment  
12 that Dr. Hackett and I presented years ago.

13 But when you looked at the core spray,  
14 every scenario -- or the core shroud, every scenario  
15 said, "We need the core spray." And if the core  
16 spray failed, what else did we need?

17 So that's part of what, then, Peter, led  
18 us to, how do we prioritize these things? And the  
19 core shroud kept coming up on top. Every time we  
20 assumed a component failed, that was it. And that's  
21 the way we approached these things.

22 We just said, "What happens if it fails?  
23 Where can it fail?" and did the assessment from that  
24 perspective.

25 Any other questions?

**NEAL R. GROSS**

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

1 MEMBER FORD: But a frequency of events  
2 in the past didn't enter into this particular --

3 MR. DYLE: Not per se. We did look at  
4 inspection history to try to figure out what the  
5 nature of the cracking was. Core spray was one of  
6 those things that we had had lots of inspections and  
7 repeated instances of cracking. So we knew that it  
8 was also something that we needed to look at quick.

9 We relied on it in a lot of scenarios,  
10 and it was one that was degraded to the point early  
11 on that we found cracking. In fact, the staff wrote  
12 a bulletin on it in 1980 requiring visual  
13 inspections every outage. So we have been  
14 inspecting the core spray lines and spargers since  
15 1980 every outage. So that's an example.

16 CHAIRMAN BONACA: I think the issue of  
17 frequency is important when it comes down to  
18 mitigation. In some cases, for example -- I don't  
19 know. I was looking at top guide. There is some  
20 fragile mode where you may end up with core  
21 movement, inability of inserting rods. You know,  
22 for that particular case, there is a statement that  
23 says, "If that happens, you know, there is the SLC."  
24 Granted. But SLC is not supposed to be needed more  
25 than with a certain frequency in the original design

**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 of the plant.

2 And so it leaves you a little bit with  
3 the question of how likely is this failure mode to  
4 occur now because of the cracking beginning to take  
5 place, which is the answer that there is mitigation.  
6 I don't think, in and of itself, it is enough.

7 MR. DYLE: Well, and I understand your  
8 question, and I think the answer is is when we did  
9 the safety assessment it let us know what was  
10 safety-related and what the consequences of a  
11 failure were, which we then rolled into  
12 consideration of which components do we look at  
13 first as far as developing a program, and then it  
14 also led us to decide what needed to be inspected  
15 and how often and what method.

16 CHAIRMAN BONACA: So that really was  
17 focusing -- okay, so there was a consideration. The  
18 main focus was the prioritization of the efforts  
19 because of the significance.

20 MR. DYLE: Right. One of the questions  
21 the staff asked initially when the core shroud  
22 failures and cracking started to occur was, why are  
23 the plants safe to continue to operate? And we felt  
24 this was the degree necessary to evaluate that, so  
25 we looked at all of the components.

**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           So that's been done, and we've built  
2           that into these inspection and evaluation documents,  
3           which I guess leads into this.

4           As far as what's in an I&E guideline,  
5           this is it. Each one of them has a description of  
6           the component. We look at the susceptibility of the  
7           IGSCC, discussion of failure consequences of each  
8           location, and we tried to identify every location on  
9           an individual component where it might fail and  
10          said, "What happens if it does that?"

11          We looked at the inspection history, and  
12          then from that we develop inspection requirements  
13          and flaw evaluation methods, and it also talks about  
14          how to report the information.

15          MEMBER KRESS: Could you give me an  
16          example of a consequence, the third bullet?

17          MR. DYLE: Yes. For the shroud, one of  
18          the things we considered was if you have a 360-  
19          degree flaw at the H3 weld, and then you have a main  
20          steam line break, what's the possibility that you  
21          might actually lift the whole shroud now that it's  
22          separated?

23          And if that occurred, what would happen?  
24          Would you lose two-thirds core height? If a jet  
25          pump disassembles, if a jet pump beam fails, and

**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 then I eject the jet pump ram's head, then I could  
2 disassemble the jet pump, and I no longer have the  
3 ability to maintain two-thirds core height.

4 So we have to go put together an  
5 inspection program that would preclude those kind of  
6 things, or have a monitoring program that says we do  
7 daily surveillance to do some tests to get that kind  
8 of information.

9 CHAIRMAN BONACA: But many of these  
10 failure modes -- that's why I had the original  
11 question in the beginning -- end up with core  
12 movement, right?

13 MR. DYLE: Right. They are -- and one  
14 of the questions that was asked early on, and I'll  
15 go ahead and address it now and then I'll let the  
16 staff talk about their studies, was, what are the  
17 synergistic effects? And we struggled with that,  
18 finding a way to do that evaluation and spend enough  
19 money.

20 So we did our deterministic view. Then  
21 we did a probabilistic assessment that I'll -- that  
22 was very simplified. We set the conditional failure  
23 probability of each component to one and let that  
24 help tweak, if you will, the approach in VIP 06.

25 And then the staff, on their own, did an

**NEAL R. GROSS**

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

1 independent assessment of that. I believe one of  
2 the labs did the work, and I'd leave that to the  
3 staff to discuss the results of that.

4 As far as the description of the  
5 components -- again, we have sketches, we have  
6 locations labeled, general plant variations. So if  
7 you've looked at the -- if any of you have had a  
8 chance to look at these documents, you may see four  
9 or five configurations, so that we can adequately  
10 describe what a different plant would have to do.  
11 And it's based on the best-available design  
12 information.

13 The onus we put on the owners is that  
14 this is the way it was designed. If you have made  
15 modifications since then, you have to look at this  
16 document, look at the requirements, and then go  
17 forward from there. So we built that in.

18 Just an example of configuration  
19 sketches, not to have a detailed discussion. But  
20 the double-leaf riser brace for the jet pump, there  
21 are two different types of double leaves, so that's  
22 just an example of the detail that we put in the  
23 document so you can figure out how it applies.

24 Susceptibility discussion -- which  
25 locations are likely to fail. They're either

**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 through IGSCC or other mechanisms like fatigue. We  
2 considered that. What are the non-susceptible  
3 locations? In those where we determined that they  
4 weren't likely to fail because of material  
5 considerations and the way that the component is  
6 built, we didn't necessarily require inspections.

7 But one of the things is you don't  
8 expect cast material to suffer IGSCC. At least it  
9 would occur after you've got the wrought material  
10 that's been welded. So we use those as kind of a  
11 criteria, and then all of that goes into the  
12 inspection requirements.

13 And I recognize I'm going quick, but  
14 this is to get you a description of the program.

15 And then your question about the  
16 consequences of failure. We looked at those, what  
17 happens, what's the other system responses.  
18 Locations that could fail and have no adverse safety  
19 consequences, we said, "Well, maybe we don't need to  
20 inspect those." But we did look at those anyway to  
21 see if there's other benefits for doing the  
22 inspections.

23 There may be economic reasons to do  
24 that. You may want to do something. We do a lot of  
25 inspection on feedwater spargers because we want the

**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 plant to continue operating. If it fails, there's  
2 no safety consequences. But we still do  
3 inspections.

4 At one time, I know at Plant Hatch we  
5 had three pages in a procedure that were safety-  
6 related inspections and 51 pages that were not.  
7 That's the degree that we were doing internals  
8 inspections on non-safety components, so we do a lot  
9 of things in addition to the VIP.

10 The other thing we looked at was  
11 inspection history. What inspections have been  
12 performed? What was the adequacy of them? If  
13 somebody had done a VT-3, and then said there was no  
14 IGSCC, we discounted that, because a VT-3 is not  
15 going to find IGSCC. It's not going to see tight  
16 flaws.

17 So we tried to understand what the  
18 inspection history told us. Is it appropriate data  
19 to consider? And then we used that to help guide  
20 us.

21 The inspection requirements list where  
22 to inspect, what's required for a baseline, what's  
23 required for reinspection, what's the reinspection  
24 frequency. Sometimes the reinspection frequency  
25 depends on the method you use to do your baseline

**NEAL R. GROSS**

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

1 inspection.

2 For example, core spray. You do an  
3 inspection of it visually. You have to do something  
4 every outage. If you use ultrasonic, we'll let you  
5 go every other outage, because you've got a better  
6 idea of what's going on with that piping. So that's  
7 an example of how we would use that.

8 We also specified what kind of scope  
9 expansion needed to be done if you found cracks,  
10 where would you look, what would the response be.  
11 And then, alternatives to inspection -- is there  
12 something you could do instead of inspecting? Could  
13 you modify the component that eliminates the  
14 consequence of failure?

15 The easiest one to think of is what we  
16 call the core plate, which is kind of a misnomer,  
17 because it's a plate in the core but the fuel  
18 doesn't sit on it, but the inspection criteria for  
19 the bolts around the periphery, so that it can carry  
20 a seismic load.

21 However, we allow that if an owner goes  
22 in and installs wedges around the periphery so that  
23 even if the bolts fail the core plate can't move in  
24 a seismic event, then we say you don't need to  
25 inspect the bolts because you've put something else

**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 in there that will preclude its movement and it'll  
2 still perform its intended safety function.

3 MR. BARTON: Has anybody done that? Or  
4 is this a hypothetical?

5 MR. DYLE: Yes. Yes, they have done  
6 that. In fact, in the GE design for the shroud  
7 repair, that is integral to what they do. To my  
8 knowledge, all of the plants that have installed the  
9 shroud repair in the GE design have the wedges  
10 installed. So that's been done that way.

11 As far as inspection methods, here's the  
12 definition of them. The EVT-1 -- well, let me start  
13 at the bottom, and maybe this -- the CSVT-1 is the  
14 old core spray visual that was required in the  
15 Bulletin 80-13. We started using that and found in  
16 some cases it wasn't adequate, and we had renamed it  
17 MVT. We finally eliminated that because it was an  
18 interim between these two and wasn't warranted.

19 So what we have is an enhanced VT-1,  
20 which is a visual with a 1/2-mil wire resolution of  
21 the camera before you ever start the inspection, so  
22 you've got to be able to clearly see a 1/2-mil wire.  
23 In addition to that, there is also some criteria  
24 about what you can see about the weld. There's  
25 requirements of necessity, whether you need to clean

**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 or not. But you can do appropriate examinations.

2 The VT-1, you have to be able to resolve  
3 a 1/32-inch wire, and this is a standard code exam  
4 with VT-3 as a general visual for mechanical  
5 condition. And, again, that comes from ASME Section  
6 11.

7 And then, ultrasonic and eddy current,  
8 and we qualify those methods based on what the  
9 component needs are. And all of the details of the  
10 methods are in VIP 03, and it's in a three-inch  
11 binder that the staff has available if you need  
12 that.

13 Flaw evaluation considerations -- we  
14 tried to describe the procedures that are necessary,  
15 the analysis techniques, and in some cases we  
16 provided equations. And I'll address some of that  
17 later. But where we had equations that we could use  
18 and standardize, we've developed those. In one  
19 case, we've even developed a computer code to deal  
20 with that.

21 What kind of assumptions do you make  
22 when you can't inspect something? One of the issues  
23 on the shroud was you go inspect the circumference,  
24 but you can't get all of it inspected. What do you  
25 assume about that region you can't inspect? So we

**NEAL R. GROSS**

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

1 looked at statistical studies and the behavior of  
2 the materials and said, "What is the appropriate  
3 safe thing to assume, since we couldn't inspect it  
4 and factor that into the flaw evaluation?"

5 NDE uncertainty -- early days of the  
6 shroud the cracking was such that we were trying to  
7 do ultrasonic examinations. We hadn't qualified the  
8 techniques, and we were even using transducers on a  
9 long pole to try to get additional information. If  
10 you've got a pole that's, you know, 60-feet long,  
11 you can get a lot of flexibility. So we accounted  
12 for that in the calculations when you do a flaw  
13 evaluation.

14 Also, limitations on use. You know,  
15 once you exceed a certain fluence level you just  
16 can't use some of the approaches that we've got. In  
17 the crack growth rates that we describe, here's a  
18 reference to the documents for later use if you'd  
19 like to look at those. But that's where the crack  
20 growth studies are documented. And the staff has  
21 issued initial and final SEs on that.

22 An example of how you would use all of  
23 this -- if you don't do an inspection, and you've  
24 qualified the technique using VIP 03 and you found a  
25 flaw -- well, you know what the uncertainty of the

**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 technique is. VIP 14 has the crack growth criteria,  
2 what you'd use for stainless in certain situations,  
3 whether you want to use the K dependency or a  
4 baseline, a base disposition curve.

5 VIP 20 and VIP 80 -- VIP 20 is the  
6 distributed length ligament computer program that  
7 allows you to calculate the remaining ligament and  
8 what's acceptable. Vertical cracking criteria,  
9 because the cracks are oriented different, behave  
10 different. And here is the shroud inspection  
11 guidelines. All of it goes together to do the flaw  
12 evaluation.

13 And then, VIP 07 is the reinspection  
14 criteria. And I think I mentioned earlier, but  
15 we've rolled 01, 63, and 07 all into VIP 76. We now  
16 have one document that addresses all of it for the  
17 shroud. But that's how you'd deal with a component  
18 like that.

19 We want inspection guidelines. We want  
20 the information provided to the staff. And this is  
21 what we've put in the guidelines. EPRI compiles a  
22 summary and provides it to the NRC every six months.  
23 So once we finish what we call basically an outage  
24 cycle, we accumulate all the inspection information,  
25 we provide it to all our members, and then we

**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 provide it to the staff.

2 We've got spreadsheets that reports  
3 that. And the biggest thing for us, it lets us look  
4 at what's going on. Is the program headed in the  
5 right direction? Do we need to make changes? Are  
6 we seeing things that are different? And go from  
7 that perspective.

8 And I guess the thing is is it's a  
9 current term and a renewal term issue. Some related  
10 issues in the program that I'll discuss now is the  
11 impact of hydrogen water chemistry, noble metal  
12 chemical additions, and VIP 03 repair issues, and  
13 some interaction with the code, and then license  
14 renewal.

15 VIP 62 -- I guess the way we'd look at  
16 it is if we're going to implement hydrogen water  
17 chemistry and noble metal, to turn off cracking, to  
18 slow down cracking, to help mitigate it, can we  
19 then, in return, get some credit for it in our  
20 inspection program? Can we inspect less often? And  
21 what this document does is go through and look at  
22 how you would justify a reduction in inspections  
23 based on the mitigation aspects of this program.

24 It is currently under staff review.  
25 They've issued RAIs and an initial ASE, and there

**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 are still some open items that we're looking at.  
2 How do you fully identify what an acceptable  
3 hydrogen water chemistry program is? We need to  
4 define the parameters, so that the staff has  
5 assurance that what licensees are doing is fully  
6 mitigated.

7 So we're trying to come up with an  
8 approach that addresses factors of improvement on  
9 crack growth, what the ECP or conductivity levels  
10 ought to be in that regard, before we can take  
11 credit for those. And we've got that built into the  
12 program.

13 MEMBER LEITCH: You talked about how  
14 effective is the hydrogen water chemistry deep in  
15 the vessel. In other words, there is varying  
16 degrees of hydrogen water chemistry. Some just  
17 suppress cracking high in the vessel, and when you  
18 put a full-blown program in you are able to suppress  
19 all the way down. Does that enter into --

20 MR. DYLE: That does enter into it. And  
21 what is identified is is the function of the  
22 electro-chemical potential and the availability at a  
23 location. So let's say you're monitoring in the  
24 recirc. loop but you want to claim credit that I'm  
25 protecting halfway up the shroud. You've got to be

**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     able to show that in the injection rates you're  
2     using, that the water chemistry parameter is such  
3     that you know that you've got the ECP at the  
4     appropriate level at that point on the shroud, or  
5     you can't take credit for it.

6             MEMBER LEITCH: Okay.

7             MR. DYLE: So that's the way it's  
8     structured. And there is the water chemistry  
9     guidelines. You can monitor ECP. We've got  
10    secondary parameters that you can use to look at how  
11    effective the program is. And as you're probably  
12    well aware, if you're using noble metal you need  
13    much less hydrogen, so you can lower the hydrogen  
14    rate. It helps with dose issues, but you still get  
15    more mitigation because it's more effective up in  
16    the core region.

17            VIP 03, here's just an overview of  
18    what's in it, and I've mentioned it several times,  
19    so I don't know if we need to spend a lot of time on  
20    it. But it's a description of the inspection  
21    technique.

22            UT, using what kind of transducers, how  
23    many megahertz, what size, what angles, whether it's  
24    a 45 RL, 60 RL, 45 sheer, all of that, a description  
25    of the vendor demonstrations that are performed on

**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 mockups. And we've got a lot of mockups at the NDE  
2 Center, and I'll go ahead and make the invitation  
3 for Bob. You're welcome any time you want to go see  
4 what the VIP has got at the NDE Center in the way of  
5 mockups and how this stuff is done. We would more  
6 than welcome you to come look at them.

7 We established NDE uncertainty, and we  
8 -- in some cases we include the flaw evaluations as  
9 uncertainty. It depends on the nature of it and the  
10 component. We don't worry about the uncertainty for  
11 determining reinspection intervals currently.

12 This thing is updated annually. We've  
13 agreed to the protocol, how we'll qualify things, so  
14 once a year all of the new techniques have been  
15 qualified, are published, and everyone who has a  
16 copy of that book gets an update on the new  
17 techniques that are available to revisions that are  
18 made.

19 And I believe, Gene, you have a copy of  
20 that also.

21 And then we tried to deal with repair.  
22 What if I have to do a repair? What if I find  
23 something that says it's a problem? The flaw  
24 evaluation says I can't operate. We have general  
25 design criteria that we developed for each

**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 component, and those are documented, and we talked  
2 about those this morning. We're in the process.

3 We're got SEs on most of those, and  
4 we're trying to finalize that. And it looks at the  
5 structural requirements, the material  
6 considerations, how it was fabricated, and what  
7 you're going to do in the way of inspections.

8 If component degradation is anticipated,  
9 you can buy contingency repair. And in the case of  
10 Plant Hatch, the way we looked at it with the shroud  
11 -- and this is just an example of how one would do  
12 this -- our management said, "We're going to have  
13 the repair on the shelf. Before we do the  
14 inspection next outage, you're going to do the  
15 repair. You're going to have the repair there in  
16 case we need it." That was 85 percent of the cost.

17 So we said, "Why do all this detailed  
18 inspection? We're better off eliminating the circ.  
19 weld cracking issue with the shroud, install the  
20 repair preemptively, and have less to worry about."  
21 So that's an example where one could do that.

22 And there's also ways to get partial  
23 cycles. You know, if you really can't go a full  
24 cycle, you can justify one cycle, so you can have  
25 time to install the repair.

**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           This should go without saying, but we  
2           wanted to make sure of this. For the safety-related  
3           internals, anything you do has got to be done to an  
4           Appendix B program. We didn't want licensees to  
5           misinterpret the VIP program, that because we had  
6           these design criteria that's all you had to  
7           consider. No. That's just the criteria. You still  
8           have to use your Appendix B program.

9           If this happens to be a code component,  
10          like the shroud or attachments to the vessel, there  
11          are also code criteria that must be satisfied, and  
12          you'd document those on the appropriate code forms.  
13          And that's the way we described that.

14                 MR. BARTON: Was there any question of  
15          our licensees if this needed to be an Appendix B  
16          program?

17                 MR. DYLE: No.

18                 MR. BARTON: Okay.

19                 MR. DYLE: What our approach has been,  
20          and as I've learned through the years doing some of  
21          these owners programs, we wrote things  
22          simplistically, and sometimes an owner would say,  
23          "Well, since you didn't discuss this, does it mean I  
24          don't have to do this, or is there something  
25          different?" So we just -- we'll get rid of any

**NEAL R. GROSS**

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

1 ambiguity if it's safety-related to Appendix B.

2 And then the other thing -- early on we  
3 were asked to develop inspection criteria for  
4 repairs. We don't know how. Let's say a jet pump  
5 riser brace cracks. We don't know what that repair  
6 would look like if it's a mechanical repair, so we  
7 can't specify inspection criteria now.

8 So what we did is put the onus on the  
9 owner that when he has a repair developed that the  
10 -- the developer of that repair must specify those  
11 inspections necessary to assure that the repair, in  
12 conjunction with that component, will perform their  
13 intended safety function. So we've put that on  
14 there.

15 Interface with the code -- as I  
16 mentioned, in some cases, Section 11 has got  
17 requirements already. Now we have the VIP  
18 guidelines, and we get a safety evaluation on it.  
19 We understand that until a licensee has approval to  
20 use that document that he also has the code  
21 requirements imposed by 10 CFR 50. So there is an  
22 overlap, and before an owner can simply use the VIP  
23 criteria in lieu of the code they must come to the  
24 staff, document such, and get it approved. And  
25 that's so we don't violate what's in the law.

**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           So we're working with that, and we're  
2           trying to develop a template that we could use for  
3           owners to send that information in.

4           Now, the punchline I guess is what we're  
5           here for. The I&E guidelines were developed without  
6           real consideration to time. At the point in time  
7           the shroud cracking got as bad as it did, and we did  
8           the safety assessment, one set of documents that  
9           were available for us to use were what they called  
10          the industry reports for plant-life extension or  
11          license renewal.

12          And it was the documentation where the  
13          industry and the staff had worked through a myriad  
14          of issues related to license renewal, what were the  
15          open items, what were the agreed-upon items, how  
16          would you address aging management programs.

17          So the degree to -- that it was  
18          applicable to the VIP, we looked at that. And we  
19          said if the owners are going to go for license  
20          renewal, if this is a reality, then we ought to  
21          construct this program so that we don't have to do  
22          this twice. We didn't want to submit I&E documents,  
23          have them reviewed and approved and get SE, and then  
24          turn around and have to resubmit those when a plant  
25          approached license renewal.

**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                   So what we tried to do was when we  
2                   looked at the failure mechanisms, and the cracking  
3                   issues, we jus said, "What's going to happen? When  
4                   is it going to happen?" and deal with it. Let's not  
5                   put any time limits on it. We're not trying to  
6                   operate a shroud for another 20 years. It's what  
7                   keeps the shroud functional for the life of the  
8                   plant, however long that is.

9                   So that's the approach we wrote, and  
10                  that's what -- that's what's built into these  
11                  documents.

12                  We then approached the staff and talked  
13                  to Gene and Chris Grimes and others and said, "We've  
14                  got another rule out there that we've got to  
15                  satisfy, how we do this." And the staff worked up  
16                  their internal mechanism, and I'm not going to go  
17                  into it because I'll probably mess it up, but where  
18                  the technical staff could review the documents and  
19                  find the technical adequacy of them, and at the same  
20                  time the license renewal staff could also review  
21                  them and see how they applied to the license renewal  
22                  arena.

23                  One thing that facilitated that is we  
24                  had some folks go through and look at each one of  
25                  these I&E documents and say -- and show in an

**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 appendix how different aspects of the document  
2 satisfied the provisions in Part 54. So we  
3 submitted to the staff a technical document, and  
4 then an appendix that says, "Here's how we satisfy  
5 the rules and the requirements of Part 54. Please  
6 review it."

7 In return, the staff gives us a  
8 technical SE, and then we also get an SE for license  
9 renewal. And that's how we built the program to go  
10 forward into license renewal space.

11 The next thing is just to look at some  
12 of the program issues.

13 MEMBER FORD: Excuse me. Robin, can I  
14 ask a question? We heard this morning from a  
15 representative of NEI about an NEI document 95-10.

16 MR. DYLE: Right.

17 MEMBER FORD: Is the VIP actively  
18 collaborating on that, so in the future we'll see  
19 the same sort of application from a technical point  
20 of view? Or you're talking very specifically about  
21 technical arguments?

22 MR. DYLE: Right.

23 MEMBER FORD: Quantitative technical  
24 arguments. Will that be part of the NEI approach?

25 MR. DYLE: I guess the more correct

**NEAL R. GROSS**

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

1 answer, Peter, would be 95-10 was in front of the  
2 VIP, but where we brought this all together was in  
3 the GALL. As the GALL was being developed and we  
4 started looking at these different components, and  
5 they listed the shroud, degradation is irradiation  
6 and IGSCC, we said, "We've got a program. Here's  
7 the VIP program."

8 We described why it was adequate. The  
9 staff reviewed that, and I do believe that the GALL  
10 will come out and say, for instance, for the shroud,  
11 BWRVIP 76 is acceptable, and the standard review  
12 plan draft that I've seen also makes reference to  
13 those kind of things. So that's where we tie that.

14 95-10 doesn't yet reflect implementation  
15 of the VIP, as far as how the licensees ought to do  
16 that, and we're working on that within the VIP to  
17 try to get that specified. We're doing these  
18 training classes. We're talking to executives to  
19 try to develop additional training so that licensees  
20 do this the same way. We've done self-assessments.

21 Matter of fact, the third one starts  
22 today or tomorrow at one of the plants where we go  
23 in and look and say, "All right. You've had the VIP  
24 program. How are you doing with it? What problems  
25 have you encountered?" And one of the things that

**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 comes out of that, we found a couple of places where  
2 they implemented the requirements right but with  
3 great effort because we did a not-so-good job of  
4 writing it.

5 So we're going to revise those documents  
6 to make the requirements more clear. But as far as  
7 95-10 goes, it's not integrated yet, and we're  
8 trying to work that direction.

9 Our belief is is if we get the people  
10 implementing the VIP documents right now, they just  
11 continue. The license renewal is immaterial. They  
12 never know that they crossed the 40-year mark,  
13 because this is the right kind of program for the  
14 current term and the renewal term. That's our hope  
15 and expectation.

16 Any other questions?

17 One of the things -- and this is where  
18 we need to interact with the staff some more. When  
19 we talk about a VIP program, we consider that any  
20 control process that implements this thing properly,  
21 and make sure that all the requirements are met and  
22 the plant is safe and we've maintained the integrity  
23 of the components.

24 I personally put together three  
25 different programs, and they were done three

**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 different ways. And when you go to a plant, some  
2 people may accomplish all of these tasks in  
3 procedures. Some may do it, as some plants do, they  
4 have an ISI program, and then they augment their ISI  
5 program with these VIP criteria.

6 Others have specifications that they  
7 use, so we've gotten to leave the technical  
8 requirements as they are, not be overly prescriptive  
9 on what the program should look like, but identify  
10 the things that had to be part of it. And that's  
11 another thing that's currently being assessed with  
12 these self-assessments.

13 Now here's what the program gets at.  
14 Make sure the inspections are done when they should  
15 be, that they use the right techniques, that they  
16 are evaluated properly, use the right people. We  
17 want to make sure the folks can do the exams. Use  
18 the correct methodology, and, where appropriate, the  
19 repairs meet the code or the VIP criteria. So  
20 that's what has to be done to implement one of these  
21 programs.

22 MEMBER LEITCH: Do the licensees that  
23 are part of the VIP program that you had mentioned  
24 earlier, are they -- are they automatically  
25 compliant? Can we assume that they're complying

**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 with the program? Or is that a future decision?

2 MR. DYLE: The way we have that set up,  
3 because as Gene mentioned I think on his first slide  
4 this is a voluntary initiative --

5 MEMBER LEITCH: Are they volunteering? I  
6 guess is the question.

7 MR. DYLE: Yes, they are. And what the  
8 executives have said repeatedly, and we've even put  
9 it in writing, is that we will implement the VIP  
10 documents as written. And I -- I'll pick one.  
11 Let's say jet pump. We provide the jet pump  
12 document, it's out, the owners review it. They've  
13 bought into it. We submit it to the staff.

14 We expect in a reasonable amount of time  
15 they start implementing that document. And it may  
16 be that the document comes out in February and the  
17 outage is in April, so you can't build that in. But  
18 as soon as you can, you start doing those  
19 inspections.

20 The staff may review those, and say,  
21 "Well, I don't particularly like that inspection.  
22 I'd rather see this." We, the VIP, will negotiate  
23 with them on that issue and try to determine the  
24 right thing. But in the meantime, we, the owners,  
25 keep implementing it the way we said we would.

**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           At such time that we have what we call a  
2 clean safety evaluation, where the VIP members and  
3 the staff are in agreement, then we will reproduce  
4 that document with the clean SE. And at that point,  
5 the licensees are committed to implementing the  
6 document as specified in the NRC safety evaluation.

7           And if they're not going to, if for some  
8 reason they can't or they've got an alternate  
9 technique that they want to use, they have 45 days  
10 to notify the staff. So that's the arrangement we  
11 have worked out at this point in time.

12           Gene, would you --

13           MR. CARPENTER: At this time, every BWR  
14 licensee in the U.S. has committed to following the  
15 BWRVIP. And we have only seen a few instances where  
16 they have taken minor exceptions to the VIP  
17 documents, and that has usually been a matter of  
18 timing as opposed to actually doing the inspections.

19           MEMBER LEITCH: Okay. Thank you.

20           MR. DYLE: Any other questions? Because  
21 this is kind of a break from the programmatic. Now  
22 I'm going to look at some of the documents in a  
23 little more detail. I don't know what you all have  
24 in the way of schedule for a break or what  
25 questions, so --

**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 CHAIRMAN BONACA: No, there is still  
2 time. I think when you get to your slide number 39  
3 or 40 --

4 MR. DYLE: Yes, sir.

5 CHAIRMAN BONACA: -- I would appreciate  
6 it if you could do what I asked you before, which is  
7 provide us with a brief summary. The next one  
8 actually is very clear -- a summary of the function  
9 that they provide, those components, for example,  
10 the shroud, the top guide, the lower core plate, top  
11 guide, etcetera.

12 The location where the cracks have been  
13 -- mostly been experienced, because I think it would  
14 be interesting for us to see the location of the  
15 welds on the shroud. And the other thing that I  
16 would like to understand is I read, for example, in  
17 the BWRVIP for the top guide that all the top guide  
18 elements have already exceeded the amount of fluence  
19 for which you have become susceptible to cracking.

20 And so my question -- and, again, I am  
21 not a material expert, so -- is you have a certain  
22 series of intervals for inspection that you have  
23 set? Would that change with age, given that  
24 susceptibility is high and you would expect with age  
25 the number of locations where you may have cracks to

**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 increase or the frequency to increase? I just would  
2 like to have that kind of information as part of  
3 this presentation, if you could. So --

4 MR. CARPENTER: If I could go ahead and  
5 address that right off the bat.

6 CHAIRMAN BONACA: Yes.

7 MR. CARPENTER: Basically, what the  
8 staff has agreed to is that once you achieve a  
9 fluence level of  $5E^{+20}$  neutrons per square centimeter  
10 -- it's a threshold limit -- you fall into a crack  
11 growth rate of  $5E^{-5}$  inches per hour, which is about  
12 three-quarters of an inch per year crack growth  
13 rate.

14 When you're below that threshold  
15 fluence, for certain geometries, for certain  
16 chemistries, you would have a lessened crack growth  
17 rate, perhaps as low as  $1E^{-5}$  inches per hour. So,  
18 basically, as the plants age, they will be  
19 inspecting more, not less.

20 CHAIRMAN BONACA: Okay. So the  
21 inspection intervals are changing with age.

22 MR. CARPENTER: They will be increasing.

23 CHAIRMAN BONACA: Or they may be  
24 increasing. So there are provisions within the  
25 guidelines to increase the inspection, depending on

**NEAL R. GROSS**

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

1 certain measurements like fluence, and so on.

2 MR. DYLE: And that's generally  
3 associated with an issue if you have a flawed  
4 component. For example, the top guide, there's  
5 nothing that says once we reach a certain interval  
6 or a certain fluence level we'll start inspecting  
7 the top guide more frequently. But we're doing the  
8 inspections at what we believe is a frequent enough  
9 interval to catch any problems before they create a  
10 serious issue. And by looking at 36 BWRs and  
11 integrating that information, as soon as we find a  
12 problem with one we can go with the other.

13 For example, we have one BWR that has  
14 the top web cracking. And we've been monitoring  
15 that location and looking at that, and it's got the  
16 highest fluence level. So we use that sort of to  
17 set our inspection frequency. Given what's happened  
18 at this plant, how often should we inspect to make  
19 sure we catch that? So that's how we tried to build  
20 that into the program.

21 And I'll try to answer the questions you  
22 asked. I'm not a systems guy. So I'm not going to  
23 be able to go into great detail about all the things  
24 that these different components do and recall all  
25 the history off the top of my head, but --

**NEAL R. GROSS**

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

1 CHAIRMAN BONACA: No, no, no. I just --  
2 you know, I think for the benefit of the whole  
3 committee, to understand where the cracks have  
4 occurred, what the experience is. The other one  
5 that I would like to point out, that's -- at least I  
6 give you my train of thought there. I spoke of the  
7 top guide, and there -- the possible failures of  
8 components which link the top guide to the shroud,  
9 and so on, have been postulated.

10 Only a few of those failure modes have  
11 been identified as safety-significant. One of them  
12 I think some of the pins up there --

13 MR. DYLE: Right.

14 CHAIRMAN BONACA: -- the failure of  
15 those pins may cause the core to move, so that you  
16 have normal insertion. For that particular failure  
17 mode, I would expect that you would have a  
18 commensurate provision for inspection maybe more  
19 frequent than others. That's the kind of insights I  
20 would like to have on the program.

21 MR. DYLE: Right. And I've got --

22 CHAIRMAN BONACA: To understand what the  
23 logic is behind that.

24 MR. DYLE: I've got some details on the  
25 top guide, but a simple answer to that -- not only

**NEAL R. GROSS**

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

1 does the pin have to fail, but you also have to have  
2 a main steam line break, so that you have sufficient  
3 delta P to lift the top guide above the fuel so that  
4 it can tip over and then you can't insert the rods.

5 CHAIRMAN BONACA: Okay.

6 MR. DYLE: So one of the provisions is  
7 is that if you can look at the delta P that's  
8 developed during a main steam line break, and show  
9 that the top guide will never lift because of the  
10 weight and the attachment arrangement, then there's  
11 much less safety concern. So those are the kind of  
12 considerations we built into that.

13 The LPCI injection -- this is limited to  
14 BWR 5s and 6s. They have special couplings. It's  
15 arranged somewhat like core spray. To the best of  
16 my remembrance -- and, Bob, correct me if I'm wrong  
17 -- we haven't seen any problems with LPCI yet,  
18 because it's installed on the newer plants, and we  
19 wouldn't expect to have any problems. But that is a  
20 means of implementing the low pressure coolant  
21 injection that we would need during certain accident  
22 scenarios.

23 The core spray line, which we've talked  
24 about in the accident scenario, it provides the core  
25 spray on top of the fuel. Some plants are more

**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     needful of having the spray dispersal, so that the  
2     nozzles are more significant about being maintained  
3     on the sparger itself that's inside the core, that  
4     it sprays down appropriately.

5                 We had some discussions early on four  
6     years ago about trying to identify which plant was  
7     what, so that the plants that needed the spray  
8     distribution would inspect the nozzles and the  
9     others didn't. We finally gave up on that and said  
10    that doesn't make any sense. Everybody is going to  
11    inspect the nozzles. So there is some conservatism  
12    we built in. Instead of worrying about that  
13    evaluation, we put it in.

14                The core spray piping that comes from  
15    the nozzle delivers that to the sparger so it cools  
16    things. The top guide, as we talked about, keeps  
17    the fuel from shifting. It also lets the rods  
18    insert. The core plate -- here it's the same thing.  
19    We've not seen any problems at the core plate.  
20    There's been limited inspections, but the  
21    inspections to date haven't been an issue.

22                And, again, this doesn't really show it  
23    well, but there are bolts around the periphery, and  
24    depending on the unit and the diameter the number of  
25    bolts change. But as long as they're there, the

**NEAL R. GROSS**

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

1 core plate is not going to shift. We don't worry.  
2 about it lifting because -- and I don't believe I  
3 have a slide to this effect. I may have a backup.

4 But when you look at the control rod  
5 drive housing there is a lip on it that's a half-  
6 inch above the top guide. So that even if all the  
7 bolts were to fail and then you had a main steam  
8 line break, so that you developed the delta P to try  
9 to lift, it can't lift more than a half-inch because  
10 it engages --

11 MR. BARTON: Are you talking about the  
12 core plate?

13 MR. DYLE: Right. The core plate. It  
14 would engage the bottom of -- it would engage that  
15 lip on the drive housings. So that's a --

16 CHAIRMAN BONACA: The topical says that  
17 you could.

18 MR. DYLE: It will --

19 CHAIRMAN BONACA: That's why I asked  
20 that question.

21 MR. DYLE: Now, the core plate or the  
22 top guide?

23 MR. BARTON: No. I think the thing  
24 you're talking about talks about the top guide.

25 MR. DYLE: Okay. The top guide.

**NEAL R. GROSS**

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

1 CHAIRMAN BONACA: Okay.

2 MR. DYLE: The top guide can lift in  
3 some scenarios. The core plate is limited  
4 vertically to a half-inch. So it won't disengage.

5 CHAIRMAN BONACA: Correct.

6 MR. DYLE: And when we were developing  
7 what was the right inspection criteria, we would  
8 have loved to have justified not trying to get down  
9 here, because it's a difficult access to do. We  
10 looked at some old General Electric studies that  
11 they had done. How far can this thing move? What  
12 happens with rod insertions?

13 And we could postulate that the nature  
14 of the way the system behaved, that even though you  
15 had a seismic event and the core plate was going  
16 back and forth, the rods would insert maybe  
17 sporadically but eventually would go all the way in.

18 Again, we said, let's not argue that.  
19 Let's just go do the inspections. And, again, you  
20 either look at the bolts or you install the wedges.

21 The shroud you're probably well aware  
22 of. It ensures a coolable geometry. It supports  
23 the fuel. It holds the top guide and core plate in  
24 place. We have had significant cracking in multiple  
25 cases. It's been inspected extensively.

**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                   Several plants are on their third  
2                   inspection using the improved criteria. We're not  
3                   seeing much growth, which is good. And it's  
4                   encouraging that this thing is not a rampant problem  
5                   that we can't deal with. So we seem to have found  
6                   --

7                   MR. BARTON: Do we understand why we're  
8                   not seeing much growth?

9                   MR. DYLE: I probably ought to say no  
10                  and defer to some other folks sitting around the  
11                  table. But the --

12                  MR. BARTON: That would be all right,  
13                  too.

14                  MR. DYLE: The simplistic answer from  
15                  our looks is is that as you go through thickness in  
16                  the shroud, the K distribution changes, K dies off,  
17                  the growth mechanism slows down from a stress  
18                  standpoint. And that's a very simplistic answer.

19                  Bob?

20                  MR. CARTER: And mitigation.

21                  MR. DYLE: And mitigation is working  
22                  also.

23                  MR. BARTON: And what?

24                  MR. CARTER: And mitigation. Hydrogen  
25                  and noble --

**NEAL R. GROSS**

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

1 MR. BARTON: Hydrogen. Okay.

2 MR. DYLE: And that's -- anything else  
3 is far beyond my expertise, and I'll defer there.

4 CHAIRMAN BONACA: He said hydrogen and  
5 noble metal, right? Okay.

6 MR. CARTER: Yes. Either separately or  
7 in combination.

8 MEMBER SHACK: What fraction, again, of  
9 plants - of BWRs are on hydrogen now?

10 MR. CARTER: A very high percentage.

11 MR. CARPENTER: Last week when we were  
12 at Argonne discussing this, basically the GE folks  
13 told us that it was somewhere in the neighborhood of  
14 about 33, 34 plants, which is almost all of them.

15 MR. DYLE: Worldwide.

16 MR. CARPENTER: BWRs. Now, worldwide,  
17 that's a different story, and I can't begin to  
18 answer.

19 MEMBER SHACK: No. We just meant the  
20 U.S.

21 MR. CARPENTER: Yes. Almost every one.

22 MR. DYLE: And a lot of them are  
23 seriously looking at noble metal as the augmentation  
24 of the hydrogen to be more effective.

25 The jet pump assembly, I'll go through

**NEAL R. GROSS**

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

1 that in some detail. But, again, that preserves the  
2 two-thirds core height. It also lets the recirc.  
3 flow come in and distributes it below, so that's the  
4 function. But its main safety function is either to  
5 maintain two-thirds core height, or some of the  
6 threes and fours, that's the route that LPCI has  
7 injected, should you need that in an accident  
8 scenario.

9 That's all I see on here that's listed  
10 as safety-related. Any other specific questions  
11 before I go on? I don't want to skip over things  
12 that you're interested in.

13 MEMBER LEITCH: In the jet pumps, for  
14 example, have you considered fracturing -- that is,  
15 debris -- as a safety issue? Or --

16 MR. DYLE: We did.

17 MEMBER LEITCH: -- do you just look at  
18 cracking, or do you think a jet pump is -- the  
19 fracture is --

20 MR. DYLE: We looked at fatigue, and we  
21 looked at every weld location for the jet pump. We  
22 looked at fatigue issues. We looked at IGSCC. We  
23 looked at what happens. And when I get to that  
24 slide, we'll talk about how we classified the jet  
25 pump components high, medium, or low. That looked

**NEAL R. GROSS**

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

1 at the consequences of the fracture.

2 We did look at loose parts, in general,  
3 in VIP 06. And we addressed that, and we looked at  
4 large, medium, and small parts, and had GE do the  
5 systems analysis. This is what happens if we have a  
6 part this big, what happens if we have a part  
7 smaller that clears the recirc. pump and comes back  
8 in, can it block the flow to the fuel channels, and  
9 things of that nature. So that was considered in  
10 VIP 06.

11 I'm not sure that I answered your  
12 question, though.

13 MEMBER LEITCH: Well, I mean, you talk  
14 about the safety implications of the jet pump, for  
15 example, as being two-thirds core coverage and to  
16 provide a LPCI injection pathway. But is there also  
17 a safety function that's got to remain intact?  
18 Because if you -- if it fractures --

19 MR. DYLE: Right.

20 MEMBER LEITCH: -- it could obstruct the  
21 core coolability, could it not?

22 MR. DYLE: It would be hard for -- from  
23 my limited systems understanding, that if the jet  
24 pump assembly failed that it would block the core  
25 cooling. It could fail in such a way, and this is

**NEAL R. GROSS**

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

(202) 234-4433

www.nealrgross.com

1 one of the issues we dealt with with the jet pump  
2 riser pipe cracking that occurred in '96 or '97 --  
3 and I can show you that when I get to the jet pump.

4 But if it failed down low where the  
5 inlet flow comes in, and then in combination with a  
6 fatigue failure we lost a riser brace, you could  
7 disassemble the jet pump so then with a recirc LOCA  
8 you have a freeflow path. And you can't maintain  
9 the two-thirds core height, so we addressed it from  
10 that perspective. We tried to look at the impact of  
11 all of those possibilities.

12 MEMBER LEITCH: Okay.

13 MR. DYLE: This is probably the most  
14 familiar to you because we've talked here before  
15 about this. And this shows the shroud, and this is  
16 the general numbering scheme. Different plants --  
17 H1, H2, and H3 are generally the same. Some plants  
18 have an H5 weld in here. Some would call this H5  
19 and H6A. So there's different numbering sequences  
20 or schemes that you might see. But, generally, this  
21 is how the shroud is put together.

22 The bulk of the cracking we've seen is  
23 up in this area, in the high fluence region and up  
24 top. When we did the original shroud safety  
25 assessment, another conservatism -- you can argue

**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 that should you fail here there are no safety  
2 consequences. But we still are requiring  
3 inspections and treating it as if it is.

4 Similarly, for most of the plants, if  
5 you failed at H2, depending on how the top guide  
6 arrangement is, that could lift -- and unless it  
7 damaged the core spray piping, it is still not a  
8 safety-significant issue, in that you could shut the  
9 plant down and maintain coolable geometry. But  
10 we're requiring inspections all the way through.

11 The H7 weld was the one of significant  
12 interest early on because it's a dissimilar metal  
13 weld with a backing ring. This is generally the  
14 filled fit-up weld where things were put together.

15 We've seen some cracking here. The  
16 cracking at H3 is actually in this ring. There's a  
17 lot of structural margin there, and so far we  
18 haven't had too many issues concerning that. The  
19 biggest thing is here when you start evaluating  
20 flaws in this arena, and as the fluence level goes  
21 up, and we restrict ourselves in the allowable  
22 margin, we have to start inspecting more frequently.

23 So until we have a good handle on what  
24 the crack growth rate is of irradiated stainless,  
25 we're going to have conservative inspection

**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 schedules based on that when we do flaw evaluations.

2 H8 and H9, we consider these as part of  
3 the shroud support. They're handled in VIP 38, and  
4 that's simply because the shroud support ring was  
5 such a unique beast.

6 These are code welds, so there's ASME  
7 criteria there. What we've imposed is more  
8 restrictive than what the code has as far as the  
9 quality of the examination. But one thing we did  
10 look at -- and I don't have details on it, but there  
11 is a lot of flaw tolerance in that structure.

12 We postulated that if you had these  
13 legs, each one of them cracked 50 percent  
14 throughwall, or 50 percent of the legs gone, how  
15 much margin do I need in this weld for structural  
16 liability? And it's 10 percent of the ligament. So  
17 there's a lot of structural margin in there, and the  
18 details of that are in VIP 38.

19 And then here it shows the jet pump and  
20 the core spray piping arrangement.

21 MEMBER LEITCH: Isn't there an access  
22 patch in that --

23 MR. DYLE: Right.

24 MEMBER LEITCH: -- that has been  
25 troublesome?

**NEAL R. GROSS**

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

1 MR. DYLE: You're correct. There are  
2 what we call access hole covers.

3 MEMBER LEITCH: Yes. Yes, that's what  
4 I'm talking about.

5 MR. DYLE: And in some plants there's  
6 two.

7 MEMBER LEITCH: Yes.

8 MR. DYLE: And there are varying  
9 designs. As we went through the generations of the  
10 GE BWRs, they came up with a top -- what they called  
11 a top hat design that eliminated having to weld and  
12 leave a crevice in that Inconel 600 which eliminated  
13 some of the cracking.

14 But those have been inspected for years.  
15 There has been cracking detected. They've been  
16 removed and replaced with mechanical connections to  
17 replace that. And that's one thing I didn't address  
18 in the flaw evaluation criteria.

19 Let's say you're going to do a shroud  
20 repair and that requires you to drill a hole in the  
21 shroud to attach some hardware. What we require  
22 people do is to go back and look and say, okay, what  
23 about the leakage if you replaced your access hole  
24 cover? We know you now don't have a leak-tight  
25 joint.

**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                   So you have to account for that leakage,  
2                   any leakage that might be created with the holes  
3                   you'd make in the shroud to attach the hardware, or  
4                   down here, and then all of that gets rolled up to  
5                   look at what that does to your fuel clad temperature  
6                   limits and make sure you've got sufficient cooling  
7                   flow. So we've required that as part of the  
8                   program, too.

9                   MEMBER LEITCH: Okay.

10                  MR. DYLE: Here is the inspection  
11                  history on the shroud, and I think this is some of  
12                  the information that you were wanting. We've got  
13                  significant cracking at horizontal welds, some in  
14                  the vertical welds, and this is generally in the  
15                  older plants. Less structural significance because  
16                  of the nature of it.

17                  There has been a couple of instances  
18                  where the shroud repair hardware has been installed  
19                  and reinspection has found some degradation in that,  
20                  and we've addressed that. We've required  
21                  reinspections and built that into what we're doing.

22                  And then there was one plant that had  
23                  what we called a ring segment crack, and I guess --  
24                  I'll put this back up. In this forging here, as you  
25                  go around the circumference there are some places

**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 where these plates were welded together. And when I  
2 say a "ring segment weld," that's the weld that  
3 joins these different ring segments together.

4 MEMBER FORD: Robin, could you go back  
5 to your previous slide, 40. I'm trying to help  
6 Mario.

7 CHAIRMAN BONACA: The other one.

8 MR. DYLE: Okay.

9 MEMBER FORD: What about the penetration  
10 welds at the bottom of the -- through the --

11 MR. DYLE: Oh, the CRD welds?

12 MEMBER FORD: Yes. What would happen  
13 from a safety point of view if there was an  
14 excessive amount of cracking at those penetration  
15 welds? We saw some with a lot of hydrogen water  
16 chemistry -- be a devil's advocate here -- a lot of  
17 hydrogen water chemistry conditions, ECP,  
18 susceptible 182 weld. What would happen from a  
19 safety point of view if you had a lot of cracking  
20 down on those --

21 MR. DYLE: From the global point of  
22 view, even if you had significant cracking you can  
23 insert the rods, and with a combination of the SLC  
24 and other systems you can shut the reactor down,  
25 maintain it at a coolable situation, and it's not a

**NEAL R. GROSS**

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

1 safety issue from that perspective. Do we want  
2 that? Absolutely not.

3 But the bottom head is flaw tolerant,  
4 the low alloy steel is not very susceptible to the  
5 cracking. The studies that we've done looking at  
6 the vessel shows that if I have stress corrosion  
7 cracking -- and I'm going to stress that these are  
8 studies that more knowledgeable people than I have  
9 done -- that the cracking, once it reaches a low  
10 alloy steel it just dies out. There is not the  
11 driving mechanism for it.

12 We have had some instances in the  
13 industry where down in the bottom head we've had  
14 some leaking CRDs that we've been able to repair by  
15 using the rolled repair, where you go in and roll  
16 and expand the joint. And generally what happens is  
17 you have a leak up in the vessel, and it runs  
18 outside of the CRD, and you see the leak. And by  
19 rolling the CRD housing back into the vessel wall  
20 you turn that off.

21 We also developed, as part of the repair  
22 program, a welded repair for that activity where you  
23 go in and do the same rolling situation to stop the  
24 leak, but then do machining and a reweld, so that  
25 you would structurally replace that weld that's on

**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 the ID. And we've been able to get that approved  
2 through ASME as a code case, so that's available for  
3 use, too.

4 You can eject the rods. We've looked at  
5 the possibility of failing and ejecting, the  
6 likelihood of growing 360 degrees and losing that.  
7 It's not going to happen. It's going to be  
8 restrained above the core plate, as long as you  
9 don't disconnect the connection. Because if it  
10 tried to drop out, it would catch on the top guide.  
11 It can only drop a half an inch as long as this  
12 whole assembly stays together.

13 So there's a lot of reasons that we  
14 don't believe that's a significant issue, but we  
15 still do inspections to address that.

16 And with hydrogen water chemistry, we've  
17 shown that we can get adequate protection down in  
18 the bottom head.

19 MEMBER FORD: Has there been a lot of  
20 inspections?

21 MR. DYLE: There's been very limited  
22 inspections. That's one of the areas where we're  
23 struggling and we're trying to get people, you know,  
24 as they have access, go do inspections, find out  
25 what's going on. Those few plants that have done it

**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 have not found problems, other than the limited  
2 leakage at Nine Mile 1.

3 MR. CARPENTER: But the staff is  
4 encouraging expanded inspections in those areas.

5 MEMBER LEITCH: There's a lot of other  
6 stuff down there besides CRDs. Have you taken a  
7 look at, like, instrument connections, core plate  
8 Delta P, lower head connections?

9 MR. DYLE: We did look at that from --  
10 and the SLC -- as you're probably aware, the SLC and  
11 the core plate delta P are an integral unit.

12 MEMBER LEITCH: Right.

13 MR. DYLE: The studies we've looked at  
14 shows that if the SLC line was to crack and fail any  
15 place, we could still get the borated solution in  
16 the bottom head and shut the reactor down. It'll  
17 perform its function even if it cracks throughwall.

18 The only way we could envision ever  
19 having a problem with the line was if you had a  
20 seismic event that might collapse the line, and  
21 we've looked at that. In fact, that was a question  
22 that came out of this group in '95 that we answered,  
23 you know, to go look at that and show that we could  
24 get the adequate mixing in the bottom head.

25 The core plate delta P, if that line

**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 fails you have an instant recognition of it by the  
2 operator because they've lost the core plate delta  
3 P, which says what happened, and they can take, you  
4 know, action to try to figure out what has occurred  
5 there.

6 We've got the LPRMs, and those  
7 insertions there included in the -- what we call the  
8 bottom head, or the lower plenum I&E document is the  
9 correct name. So we've addressed all of those  
10 penetrations and locations in that document and  
11 prescribed --

12 MEMBER LEITCH: SRMs and IRMs as well?

13 MR. DYLE: Correct. They're in there,  
14 the dry tube, and look at all the pressure boundary  
15 issues.

16 Do you remember the number? I don't  
17 remember the number on that one.

18 MR. CARPENTER: 48.

19 MR. DYLE: 48. Okay.

20 MR. CARPENTER: I'm sorry. 47.

21 MR. DYLE: 47?

22 MR. CARPENTER: 47.

23 MR. DYLE: 47. There's the shroud  
24 history.

25 This is a busy slide, and I -- I guess I

**NEAL R. GROSS**

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

1 wasn't going to put a whole lot of time on this, but  
2 it gives you an idea. When a shroud cracking  
3 occurred, what we did was go through and look at all  
4 of the shrouds and break them up based on what their  
5 materials were, how long they had been operating,  
6 and what their initial five-year -- their first five  
7 years of operation what the conductivity was.

8 And we classified the plants as A, B,  
9 and C, and the staff agreed to that. And this went  
10 from least likely to crack to most likely to crack.  
11 Eventually, every plant will go from A to B. We  
12 hope using mitigated technologies that no more Bs  
13 move to Cs, and that means it doesn't see cracking.

14 The next slide says, "Here's how you  
15 decide for a category B shroud to do inspections,"  
16 and you're probably better off looking at your  
17 handout. But you go do the inspections as specified  
18 for H3 and H4, you've got to do one of those, H5,  
19 and H7. Is the cracking less than 10 percent of the  
20 inspected length?

21 And if the answer is yes, then we have  
22 to do -- you have to do more inspections. If the --  
23 you know, you've got to make sure you've got enough  
24 coverage, and then you can decide what to do. If  
25 the question -- if the answer is no, you've got to

**NEAL R. GROSS**

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

1 make it a category C and expand scope and look at  
2 more welds. So we have some conservative criteria  
3 for those plants.

4 And then, this next chart is similar.  
5 It says, "Here is how you deal with the category C  
6 shroud." And one of the first things is, and it  
7 goes back to the discussion we had earlier about  
8 uninspected length. Is the inspected length of the  
9 weld greater than 50 percent of the length of the  
10 weld? In other words, did I get more than 50  
11 percent coverage?

12 And if the answer is no, I've got to go  
13 do some other things to make sure that what I'm  
14 doing is acceptable. If the answer is yes, then we  
15 had a treatment of that. So we're trying to require  
16 minimum coverage, and if you didn't get that you had  
17 to do a lot more.

18 Similarly, there is criteria for doing  
19 the vertical weld inspections. You know, how much  
20 cracking do you find? And make decisions based on  
21 that. And, you know, I've just showed you three  
22 slides that summarize what's in 40 pages of a  
23 document. So it's -- I'm not sure that I gave it  
24 fair treatment, but that's how we set this program  
25 up.

**NEAL R. GROSS**

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

(202) 234-4433

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

1                   And like I said, we've done a lot of  
2 shroud inspections and are staying on top of that.  
3 There's more inspection requirements for the  
4 vertical welds, which we've changed and added more  
5 to. And, again, is the vertical weld free of crack  
6 indentations? Yes. Then we have an inspection  
7 period. No. And then you work yourself through how  
8 much of it is, how much do you inspect, and what's  
9 the appropriate evaluations to perform.

10                   All of this -- I should say, when we  
11 talked about the flaw evaluations, we applied code  
12 margins, so this is not -- we've got code margins in  
13 there on upset loads and things of that. So when we  
14 say yes or no, it's safe, that includes the margins  
15 that ASME would put on its normal components.

16                   And then we set the reinspection  
17 intervals based on the amount of cracking found also  
18 using the stress that would be applied at that weld.  
19 And then we also accounted for fluence to the degree  
20 that low fluence plants can use limit load only. As  
21 fluence increases, we require people to use LEFM to  
22 evaluate their flaw carrying capability. And that's  
23 indicated in the notes at the bottom of that page.

24                   Bob, speak up if I leave something out  
25 on this. Again, this is a summary of the flaw

**NEAL R. GROSS**

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

1 evaluation for the shroud. It depends on the  
2 fluence. At the end of the evaluation period -- and  
3 what we mean by that is is if I find a flaw today, I  
4 don't look at the fluence that that component is  
5 going to experience today.

6 I look at the fluence for the period of  
7 time I expect to operate. So if I want to operate  
8 six years, I have to estimate out what the fluence  
9 will be then and then put that number in and do the  
10 calculation on the flaw tolerance.

11 Use limit load for ductile behavior,  
12 LEFM and elastic-plastic for the less ductile  
13 behavior. And this is the code that I talked about,  
14 the distributed ligament length code. It's been  
15 updated a couple of times. You can also use this  
16 for LPCI, for core spray in the nature of the code.

17 And the last item on the shroud, here is  
18 the status of the review. And I -- I think this is  
19 accurate. And, again, VIP 01 was the initial, 07  
20 was the reinspection, 63 was the vertical welds, and  
21 we've rolled all of those into VIP 76, submitted  
22 that, and it has a license renewal appendix. So  
23 that's one, once it's reviewed and approved, that'll  
24 include the license renewal aspects.

25 Any questions on the shroud?

**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 CHAIRMAN BONACA: I have a question  
2 regarding timing. How much time do you think you  
3 still need? Is this part of the rest of the  
4 presentation? The agenda shows a full presentation  
5 later on provided by you of half an hour each.

6 MR. CARPENTER: Yes, sir. And I will  
7 not need a half hour each. So --

8 CHAIRMAN BONACA: Okay. So, because  
9 this is part of that.

10 MR. CARPENTER: Right.

11 CHAIRMAN BONACA: So maybe we should  
12 take a break now, and then continue the presentation  
13 later?

14 MR. DYLE: If you'd like. I have three  
15 more components to discuss like I did the shroud,  
16 so --

17 CHAIRMAN BONACA: So you need at least  
18 half an hour to go through it.

19 MR. DYLE: At least a half an hour. But  
20 then I believe that's -- what I tried to do was give  
21 a description of the program, so that when the staff  
22 talked about what they've done with it it makes  
23 sense.

24 CHAIRMAN BONACA: So why don't we take a  
25 break now and meet again at 10 of 3:00.

**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 MR. DYLE: Okay.

2 CHAIRMAN BONACA: Okay? Good.

3 (Whereupon, the proceedings in the  
4 foregoing matter went off the record at  
5 2:35 p.m. and went back on the record at  
6 2:51 p.m.)

7 CHAIRMAN BONACA: We are resuming the  
8 meeting now, and continuing with the presentation.

9 MR. DYLE: Okay. The next component --  
10 we're on page 50 of the handout -- is the jet pump  
11 assembly, and this is -- we've had some questions on  
12 this. What we've got -- and this is a sketch that  
13 comes out of VIP 41, which is the document. The  
14 numbers that you see next to each one of these  
15 locations are individual numbers and paragraphs that  
16 we have a discussion in the VIP document, and the  
17 appropriate need to inspect or not inspect,  
18 depending on the materials.

19 We have these different -- there's  
20 different configurations on how these rings are  
21 attached to the shroud support. It sometimes seems  
22 that our designer was trying to find a unique  
23 version for everything they built, because we have  
24 quite a few configurations here.

25 The jet pump sensing lines which measure

**NEAL R. GROSS**

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

1 the jet pump pressures and performance, we take  
2 those lines out. That's one of the ways we do  
3 surveillance, by seeing if we have the jet pump  
4 operating properly.

5 You have the jet pump inlet that comes  
6 in here, goes up, goes through what we call the  
7 ram's head. You have the jet pump hold-down beam.  
8 We've had failures there. We've had cracking,  
9 different types. If you look at VIP 41, there's a  
10 discussion of those.

11 And then, we accelerate the fluid  
12 through, and then we have the nozzle here that  
13 allows the fluid from the annulus to be sucked in  
14 and then taken to the bottom head. So that's how  
15 the jet pump works, and we've got a detailed  
16 discussion of that in the document.

17 As you ask about what's the inspection  
18 history, we've had indications on the hold-down  
19 beams. We had at least one plant where the hold-  
20 down beam failed, and that ram's head that I was  
21 talking about came off, and then they were able to  
22 detect that because when they look at the jet pump  
23 sensing lines it shows no flow through there. They  
24 understand that there's a problem. They bring the  
25 unit down and then do the appropriate repairs.

**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 Riser brace welds -- we've had some  
2 cracking there. Riser pipe welds -- we had  
3 discussed that earlier, and that is actually where  
4 this riser pipe comes into the nozzle and is welded.  
5 We had cracking down in that region that we've  
6 inspected and found and dealt with.

7 Riser brace-to-yolk welds, wear at the  
8 set screws, and one of the things we do, you can  
9 look at the set screws and wedges where these  
10 brackets attach. And if you see evidence of wear on  
11 the wedges, like the jet pump has been moving, then  
12 we understand that there may be a fatigue issue that  
13 you can expand scope and do inspections from that  
14 perspective.

15 For the jet pump, all welds were ranked  
16 based on safety significance. And hindsight being  
17 what it is, we might have done away with medium and  
18 low, because if you look at our document -- and I've  
19 got some discussion of that -- but in the VIP 41,  
20 the medium and low get the same inspection criteria,  
21 and that was to be conservative.

22 Although we could have argued less  
23 inspections for the low priorities, we did something  
24 different. But the way we classified these were  
25 high was any location that if it cracked it could

**NEAL R. GROSS**

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

1 create an immediate failure, and the jet pump would  
2 come apart. That had to be inspected quickly. We  
3 wanted those, and we set the baseline appropriately.

4 Medium, it could crack and eventually  
5 lead to a jet pump disassembly, but it was a long  
6 period of time. And then, low, there was really no  
7 significance to the cracking, but there was some  
8 reasons to go look.

9 MEMBER LEITCH: In the document, it says  
10 that low may be -- excuse me -- low right now is  
11 treated as medium.

12 MR. DYLE: Right.

13 MEMBER LEITCH: But in the future, it  
14 may be reevaluated.

15 MR. DYLE: Right.

16 MEMBER LEITCH: Could you say what would  
17 be the criteria for that reevaluation?

18 MR. DYLE: Well, one of the criteria  
19 would be is if we go through and do -- the fleet has  
20 done a series of inspections, and over the next 10  
21 or 12 years we find no evidence of indications in it  
22 or the mediums, and we better understand how the  
23 materials behave, we may change those inspections to  
24 a sampling. We may eliminate some of them,  
25 depending on the materials.

**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 By the same token, if we start to see  
2 more indications than we expected, we may change and  
3 make it more frequent.

4 MEMBER LEITCH: That's one of the  
5 questions I had. The inspection frequency seems to  
6 be based upon safety significance.

7 MR. DYLE: Right.

8 MEMBER LEITCH: Rather than operating  
9 history. Is operating history factored in? In  
10 other words, if you have something that's low safety  
11 significance, but there's been a significant number  
12 of problems with it, does it ever get to be high?

13 MR. DYLE: It may not be high from a  
14 safety perspective, but we would inspect it more  
15 often.

16 MEMBER LEITCH: I mean, from an  
17 inspection frequency.

18 MR. DYLE: From an inspection  
19 standpoint, we would upgrade that and do the  
20 inspections more frequently if that was warranted,  
21 because we want the plants to operate. We want the  
22 plants safe. And if we did that, then we bring the  
23 document back to the staff for their review and  
24 approval. So --

25 MEMBER LEITCH: So the categories high,

**NEAL R. GROSS**

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

1 medium, and low are really safety significance.

2 MR. DYLE: Safety significance.

3 MEMBER LEITCH: But the operating -- but  
4 the inspection frequency may be biased depending  
5 upon operating history.

6 MR. DYLE: Right. Operating history and  
7 safety significance combined. And what we think  
8 we've done -- and the staff has agreed with us -- is  
9 that by accelerating these high locations, they are  
10 precursors, if you will, they're more serious if  
11 they should crack, and then the same materials, and  
12 they're in the same general environment in the  
13 annulus, so they should give us some indication how  
14 the rest of the assembly would perform.

15 MEMBER LEITCH: Yes. Right.

16 MR. DYLE: So we're kind of building on  
17 the totality of the program. And part of what we  
18 argued to ourselves was is I've got -- you know,  
19 I've got 10 of these jet pumps, 20 pipes, 35 plants.  
20 Over six years I'm going to have a lot of inspection  
21 data to let me evaluate what's going on.

22 MEMBER LEITCH: Right.

23 MR. DYLE: And we believe that's  
24 conservative.

25 MEMBER LEITCH: Okay.

**NEAL R. GROSS**

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

1 MR. DYLE: And this is -- to your  
2 question, this is the inspection flow chart on how  
3 you would do this. If the component is high safety  
4 significance, inspect 100 percent of the population  
5 in the next inspection cycle, which is defined as  
6 six years. So for a plant that's on two-year  
7 cycles, over three outages I'll inspect all of  
8 those, with at least half of them to be inspected  
9 the first outage that you implement this document.

10 So right up front we're wanting to get  
11 information on those quickly and try to understand  
12 what's going on. If you have flaws, you expand  
13 scope and do everything in that outage. If you have  
14 no flaws, then you use the reinspection frequency  
15 that we specified.

16 For the medium and low, you come down  
17 this path, and here's the inspection scope that's  
18 set up. Because they are less significant, we allow  
19 more time. But, then again, depending on what  
20 happens here, it may affect what we do with these  
21 other components. So we would move back and forth.

22 And then here's the reinspection  
23 frequency that's contained for the jet pump. We  
24 require more inspections on high inspections, so you  
25 inspect 50 percent of the population the next

**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 inspection cycle. So the first inspection cycle you  
2 do the whole population. The next six years you do  
3 at least half of them from a sample perspective.

4 And you do 25 percent of the medium and  
5 lows, and that's consistent with the sampling  
6 process that the code uses.

7 MEMBER LEITCH: These thermal sleeve  
8 welds that are inaccessible on the -- associated  
9 with the jet pumps. It seems as though there's an  
10 open issue there. Can you comment on what work is  
11 being done to resolve that? Is there no inspection  
12 technique available for those --

13 MR. DYLE: There is not yet one proven,  
14 but that's being worked on. And you're talking  
15 about where this riser attaches down in the nozzle?

16 MEMBER LEITCH: Right. Yes.

17 MR. DYLE: We're doing the inspections  
18 of all of those that we can see and get access to.  
19 And that gives us some indication of how well that's  
20 performing. For several years, some of the plants  
21 did what we call the -- the acronym we used was  
22 RENSA weld examinations, where we actually looked at  
23 where the thermal sleeve was attached to the nozzle  
24 from the OD of the nozzle.

25 And what you did was ultrasonically look

**NEAL R. GROSS**

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

1 through. But what that really characterizes is  
2 whether you have a bond there, or whether you have a  
3 crack that might be propagating out of that weld  
4 into the safe end of the nozzle. But it wouldn't  
5 look at anything below there because you couldn't  
6 get the sound in and back out from an inspection  
7 standpoint.

8 And those examinations have resulted in  
9 no problems to date. That's one of those that was  
10 never required by the code or anything else, but the  
11 owners did that. And I know we've got a lot of  
12 inspection data for Hatch that we looked at for  
13 years doing that. But, again, that doesn't get at  
14 the thermal sleeve itself. It looks at the weld and  
15 then the nozzle, and that's the best effort that you  
16 can do right now.

17 MEMBER LEITCH: Yes. Okay. Thanks.

18 MEMBER FORD: Robin, could I follow up  
19 on that particular point that Graham brought up?  
20 How should -- we had a similar question this morning  
21 about containment, corrosion -- inaccessible parts  
22 of the containment. What you're saying is if you  
23 don't see a crack in the areas that you can inspect,  
24 then there's a likelihood that you won't see -- that  
25 there are not cracks in an area that you cannot see.

**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 How sound a reasoning is that?

2 MR. DYLE: Well, to some degree, it's  
3 the best we can do with the technology we have. So  
4 we're requiring inspections of everything we can get  
5 at and try to reach conclusions, because the  
6 materials are similar and the environment is  
7 similar.

8 MEMBER FORD: But the stress may not be.

9 MR. DYLE: But the stress may not be.  
10 The other thing is -- and this is where the  
11 monitoring comes into play again -- we're requiring  
12 this jet pump monitoring of performance. And if  
13 that weld were to crack to the degree that it would  
14 leak and degrade the flow, or affect the performance  
15 or completely go throughwall, then this jet pump no  
16 longer operates. You do your daily surveillance and  
17 it says, "I don't have flow in that jet pump. I've  
18 got a problem."

19 MEMBER FORD: So your risk assessment,  
20 though, for any part, you would go through that kind  
21 of risk -- the impact of that was assumptions you  
22 are making.

23 MR. DYLE: Yes. The document where we  
24 looked at that is VIP 28. When we looked at -- when  
25 we looked at the impact of cracking at the weld just

**NEAL R. GROSS**

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

1 outside of that one that's -- and what we found  
2 there is that you have IGSCC might start. And then  
3 later fatigue takes over and the flaw would grow.

4 And the window in which you have the  
5 opportunity that you'd have insufficient ligament to  
6 carry the load should I have an accident, which it  
7 really creates the problem, versus the thing  
8 separating and then I'm able to detect that the jet  
9 pump is not operating, was a matter of a few days.  
10 And when you looked at the risk assessment from that  
11 perspective, it was a very low number.

12 I don't remember what the number was,  
13 but that was -- we did that in '97, '98, somewhere  
14 in that timeframe. And the staff has reviewed that  
15 and approved that as a JCO for everybody to continue  
16 to operate until we started doing more of these  
17 inspections. So that's been considered from a risk  
18 perspective.

19 Flaw evaluation is just simply we use  
20 the limit load techniques, and the DLL code that I  
21 discussed earlier could be used for this component  
22 as well. And the current status is we've gotten a  
23 safety evaluation from the staff in February of this  
24 year, and there are some guidelines that need to be  
25 revised based on the comments they've made. And

**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 we've discussed those. We understand what they  
2 want, and we're in the process of doing an update to  
3 incorporate that information.

4 And I guess this is an example of --  
5 someone asked earlier, and I don't remember who --  
6 about how we implement a document. We would expect  
7 the owners to continue to implement VIP 41 as we  
8 wrote it until such time as we update the document  
9 to reflect the safety evaluation, and then that's  
10 how they would implement it. So that's the  
11 agreement we have.

12 The next item is the top guide. There  
13 is -- just looking down on it, and here's the side  
14 view of it, so you can see that configuration.  
15 That's typical for the 2s through the 5s. The BWR 6  
16 has got a slightly different configuration.

17 I believe, Dr. Bonaca, you were talking  
18 about these pins here. These are aligner pins that  
19 you set the top guide down on. It aligns it and  
20 holds it in place, and we've evaluated what's the  
21 consequences of failures of these, can the thing  
22 move or not, and what's the appropriate inspections.  
23 And there are different configurations of those.

24 Another one is the hold-down assembly.  
25 You have to study -- every time I look at this, I

**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 have to stop and look at it again to try to figure  
2 out what all we've got captured here. But this is  
3 the BWR 2 through 4 hold-down device. This is the  
4 5. This is the 6. So there are some differences.  
5 And, again, you can look at the failure of this  
6 component and say, "If all of these failed, will the  
7 top guide lift? Can it move? Can it not?" And  
8 that lets you set whether you need to inspect this  
9 top guide hold-down device or not.

10 Rim welds on the top guide -- and,  
11 again, this is just to give you an idea of the  
12 technical detail that's in these documents. I don't  
13 know to what degree you've had the opportunity to  
14 review them. But we've got -- here's the  
15 fabrication weld on the top plate here, and then  
16 you've got the rim weld that would be in this  
17 structure.

18 And different ways to hold the core  
19 plate down -- the plate down on this rim and how it  
20 sits on the bottom plate, and then this is set down  
21 at the H5 weld region. Excuse me, this is up at the  
22 H2 and H3.

23 I mentioned that the BWR 6 has a  
24 slightly different configuration, and this you can  
25 see -- we've got it shown here, so you can see how

**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 the H1 and H2 shroud welds are in relation to that.  
2 And it's a slightly different configuration, and  
3 it's shorter.

4 The inspection history and what we've  
5 seen to date, there has been a lot of VT-1s and VT-  
6 3s. And using VIP 26, there were previous GE SILs  
7 that were used, and we did inspections in relation  
8 to that.

9 And I guess this is a good place to make  
10 the comment, one of the things the VIP program did  
11 is we went back and revisited all of the individual  
12 SILs for a given component. If they were safety-  
13 related, we made sure we incorporated either those  
14 requirements or new requirements into the VIP  
15 document and replaced the safety-related SILs.

16 For those SILs that were not safety-  
17 related, but were suggestions that owners might  
18 consider, we didn't try to address that, and we left  
19 it to the owners to choose what of those they wanted  
20 to use. So that's what we've done.

21 As I mentioned earlier, Oyster Creek has  
22 got indications in the top guide. We have removed  
23 those samples. We've looked at them. We've looked  
24 to see if they were weld repairs.

25 We've also taken those samples and put

**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       them in what we call the CIR, which is a program  
2       looking at cracking and irradiated stainless, and  
3       we're assessing the degree -- it appears that these  
4       flaws would be IASCC. We haven't determined that  
5       yet, but that's one of the things we're going to  
6       look at.

7               And then, based on the results of that  
8       metallurgical review, see if there's anything else  
9       we need to do. But to date, that's the only plant  
10      that's had that problem.

11             There's rim weld cracking and it  
12      oversees non-GE BWR, and I think that was in non-  
13      stabilized 347, if I remember right. That was --

14             MEMBER SHACK: There's no such  
15      statement.

16             MR. DYLE: That was the problem.

17             (Laughter.)

18             It was supposed to be 347, and the  
19      metallurgical results indicated it may not have  
20      been. But we have limited access to some of that  
21      information, so I -- you know, I wouldn't take that  
22      to the bank. That's --

23             MEMBER SHACK: Now, the Swedes replaced  
24      the top guide, right? But they did that without any  
25      indications?

**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 MR. DYLE: There were some that replaced  
2 all that -- they have the removable internals.  
3 They're not welded in place. They were bolted, so  
4 they could remove them. So it's a different design.

5 MEMBER LEITCH: Talking about SILs there  
6 just a minute, there is a statement in VIP 41  
7 concerning the jet pumps on Roman numeral XI, the  
8 executive summary. It says that the -- basically,  
9 that if you use this, you can -- that the VIP --  
10 these guidelines can be followed in place of prior  
11 GE SILs related to safety to assure the essential  
12 safety functions of the jet pump.

13 MR. DYLE: Correct.

14 MEMBER LEITCH: It seems to me that's  
15 too sweeping a statement. There's some SILs that  
16 tell you how to read and interpret jet pump  
17 instrumentation, and recommend actions to do this.  
18 This would seem to say "forget all that."

19 MR. DYLE: No. If that's what it says  
20 to you, then we need to take a note to look at that,  
21 because what we mean by that is any inspection of  
22 the assembly itself we've replaced those  
23 inspections. We've either incorporated them into  
24 VIP 41 or replaced them with what we think is newer  
25 and more conservative or more appropriate

**NEAL R. GROSS**

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

(202) 234-4433

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

1 inspections.

2 The monitoring of the jet pump  
3 performance is still required.

4 MEMBER LEITCH: Okay.

5 MR. DYLE: And we would --

6 MEMBER LEITCH: You have another note  
7 back on page 3-2 that says it more clearly, but I  
8 just think this statement here taken at face value  
9 is a little too broad.

10 MR. DYLE: And that's in the executive  
11 summary?

12 MEMBER LEITCH: Executive summary, Roman  
13 numeral XI, about the middle of the page.

14 MR. DYLE: Okay. Thank you.

15 Bob, we need to -- we'll just take a  
16 note to make that more clean.

17 MEMBER LEITCH: Yes. Thank you.

18 MR. DYLE: I appreciate that. Thank  
19 you.

20 And, you know, we think we did a real  
21 good job with these things, but obviously we're  
22 going to have things like that where we could have  
23 been more clear, and somebody reviewing it anew and  
24 looking at it from a different perspective. We've  
25 had some of that with the staff interactions.

**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           What did you mean? We thought we knew  
2           what we meant, and they said, "What did you mean?"

3           This is just an example of the table,  
4           and I -- we've gone a long time, and I don't want to  
5           bore you to tears, but here are some of the examples  
6           where from a table you have the location identified,  
7           a description of it, what's applicability, which  
8           plant. For example, the grid beam, location 1 is  
9           applicable to 2 through 5s. Whereas, the aligner  
10          pins at locations 2 and 3, if you go back to the  
11          figure in the document, would only apply to the BWR  
12          2.

13          And then there's a discussion of the  
14          results of the structure, what happens if it fails,  
15          and then based on that what inspection should be  
16          done. And there are several pages of this that  
17          would allow you to go through and make the decisions  
18          for your plant, for your configuration, for your  
19          operating condition, what inspections are  
20          appropriate.

21          MEMBER SHACK: When I was looking  
22          through this, and I look at the staff RAIs on this  
23          -- you know, there's one, for example, that comments  
24          that VT-1 really can't see stress corrosion cracks  
25          very well, and you would have to look at an enhanced

**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 VT-1. And I didn't see a response to that.

2 Now, is, in fact, in -- do you use  
3 enhanced VT-1 here? Or --

4 MR. DYLE: What we said we would do --  
5 this was several years ago, and it's a general  
6 policy -- we've had this discussion with the staff  
7 that we need to -- there's been discussions like  
8 this that went on over time and were pointed out.

9 The approach that we were going to use  
10 is any place that we were looking for tight IGSCC  
11 type flaws we would use EVT-1, because we understood  
12 that was the right mechanism to use. It was that  
13 logic that said we'll do away with the MVT or the  
14 CSVT-1. So if we're not looking for tight flaws, if  
15 we're looking for like a fatigue failure that might  
16 be more readily visible with the VT-1, we could use  
17 that. But for tight IGSCC type flaws we were going  
18 to require that to be updated for everything.

19 MEMBER SHACK: I saw that statement, but  
20 then it wasn't clear whether we considered this an  
21 EVT-1 or a VT-1.

22 MR. DYLE: Well, we will --

23 MEMBER SHACK: Everywhere it says VT-1  
24 --

25 MR. DYLE: Every place -- our commitment

**NEAL R. GROSS**

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

1 was every place that we're looking for IGSCC flaws  
2 we're going to bring it up to EVT-1.

3 MEMBER SHACK: Even if the document  
4 doesn't say that.

5 MR. DYLE: Because we've got to go back  
6 and revise these documents. The process for this  
7 will be once the staff has issued a safety  
8 evaluation that we agree with, then we will revise  
9 the document to incorporate all of those comments  
10 and other enhancements that we've seen that have  
11 been necessary, like the comment that was just made.

12 We will then provide that to the staff  
13 and let them see that we've incorporated those  
14 changes, and make sure we've done what we said we  
15 would do and let them buy into that. And then we  
16 would issue this document again with an A on it, and  
17 it would mean it's an approved topical, and it would  
18 include the safety evaluations and all of the  
19 reviews.

20 So that's the process, and that's the  
21 next step in the process with the staff, that over  
22 the next year or so -- Bob?

23 MR. CARTER: Yes. That one is hard to  
24 trace. And we addressed that particular issue in  
25 response to --

**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 CHAIRMAN BONACA: Would you use the  
2 microphone, please?

3 MR. CARTER: Oh, certainly. We  
4 addressed that particular response or that  
5 particular issue in the response to the core spray  
6 I&E document, where we had originally some -- maybe  
7 not as stringent visual techniques. And we -- in  
8 the response back to the staff on that, we committed  
9 to perform EVT-1 for detection of IGSCC.

10 MEMBER SHACK: Yes. I guess we got --  
11 it was -- you had the general statement in the  
12 letter that Robin just made, that when you were  
13 looking for tight, you know, SCC cracks you were  
14 going to use EVT-1. Some of the inspection  
15 guidelines actually call out EVT-1, and some of them  
16 still call VT-1 in situations where it's clear to me  
17 you're looking to address SCC. And all you're  
18 really saying is that those just haven't been --

19 MR. DYLE: Yes, that's a timing issue.  
20 We made that commitment in response to core spray  
21 after this document was already published. So we  
22 wouldn't have revised the document just to fix that.  
23 That's just one of the changes we understand we have  
24 to make and bring forward in the final approved  
25 version.

**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           There's three more pages of the top  
2 guide inspections, and unless you have specific  
3 questions I'll go ahead, for time's sake, and skip  
4 over that.

5           MEMBER SHACK: Now that you've put this  
6 in the public domain, can we remove the non-  
7 proprietary from the non-proprietary version of it?

8           MR. DYLE: Now that I've put what? That  
9 portion of the table?

10          MEMBER SHACK: This table is  
11 proprietary.

12          MR. DYLE: Well, it's available for  
13 public today, that portion of it. We have non-  
14 proprietary versions of all these documents  
15 available, because we had to do that --

16          MEMBER SHACK: Right. This isn't  
17 included in the non-proprietary version.

18          MR. DYLE: Yes. And that's something  
19 that we constantly have to discuss and consider.  
20 It's in here. It's in the public. We're not going  
21 to make the whole document non-proprietary, no,  
22 because -- well, I'll leave it at that. I'll let  
23 the lawyers discuss it.

24          Flaw evaluation criteria for the top  
25 guide -- we've got considerations for the grid beams

**NEAL R. GROSS**

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

(202) 234-4433

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

1 where you use LEFM to look at that, and there's  
2 equations given in the appendix. This is one of  
3 those where it was a unique component. We developed  
4 the equations and gave them to the licensees. The  
5 staff has reviewed them.

6 For other locations along the rim, or  
7 other things, you would use different methods. And  
8 we would use the stress analysis to determine the  
9 acceptability of it.

10 And here is the status of the review. I  
11 guess, Bill, to your comment, if you look at the SE  
12 data, it was in September of '99. So that was an  
13 earlier document that had been submitted.

14 We're going to have an accelerated  
15 program this year to try to get these things brought  
16 up to date.

17 That's all I was going to discuss on the  
18 internals. The last item that I have been asked to  
19 discuss was what we're doing with the IGSCC and  
20 piping, just because the VIP had done this, and  
21 that's what the next several slides are about.

22 We labeled it BWRVIP 75. That's where  
23 the documentation is contained.

24 Yes, Bill?

25 MEMBER SHACK: Just one -- your

**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 evaluation really looks at the cracking of the  
2 single beam. I mean, this looks to me like a highly  
3 redundant structure. If I broke one beam --

4 MR. DYLE: Absolutely.

5 MEMBER SHACK: -- nothing is going to --  
6 have you ever gone through a -- you know, how much  
7 would you really have to bust this thing up so that  
8 things could really begin to move?

9 MR. DYLE: We had some finite element  
10 studies that looked at some of that initially, and  
11 the numbers were rather large. And depending on  
12 what the seismic loads were, what the different --  
13 the specific plant configuration was, and everything  
14 else, it was hard to get your arms around and figure  
15 out what you put generically.

16 So we require the inspections, and then  
17 on a plant-specific basis you would look at your  
18 flaws for your plant.

19 Bob?

20 MR. CARTER: I couldn't say it any  
21 better, really. Just the myriad of different loads,  
22 different design configurations, made it difficult  
23 to say, "What's the absolute minimum?" you know, so  
24 we didn't -- we didn't try to take that approach.

25 MR. DYLE: Some of this stuff you all

**NEAL R. GROSS**

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

1 could present better than I could. You know the  
2 history better than I do.

3 But for the BWR piping, in the '60s we  
4 had some scattered incidents of IGSCC. In the '70s,  
5 we had the small diameter crack, pipe cracking,  
6 particularly in the bypass lines around the valves,  
7 that the industry started dealing with.

8 And I remember reading statements of  
9 large bore piping will never crack. Well, in the  
10 1970s, large diameter piping cracked, and we've been  
11 dealing with it ever since.

12 In response to that, there was a  
13 concerted effort among the industry, the old BWR  
14 Owners Group pipe cracking initiative, and the staff  
15 worked for years -- Warren Hazelton and others --  
16 developed Generic Letter 88-01 and NUREG-0313 to  
17 address the cracking issues. And that has been in  
18 place for years. What VIP 75 does is revisit that.

19 As I said, there was the owners group  
20 activities, BWROG-1 that lasted here, and then 2  
21 through 88. A lot of plants did different things.  
22 Some replaced all of their piping. Some replaced  
23 parts of them, different sections. Some did local  
24 repairs and then did inspections more frequently,  
25 because what was going on in this arena was still

**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 under development.

2 Mitigation people used HWC early and did  
3 augmented inspections. In the end, 0313 was the  
4 technical basis document that was issued by Generic  
5 Letter 88-01. And that's been in place since then.

6 These categories remain today, and I  
7 will say that we didn't -- we didn't do anything  
8 with these in VIP 75. We just accepted the  
9 categories for what they were and addressed  
10 inspection criteria. But this is how the NUREG  
11 categorized things from resistant material that was  
12 pristine, pure, to stuff that hadn't been served  
13 very long and that was stress-improved, to longer  
14 service stress-improved, no stress improvement, non-  
15 resistant, and so forth. So those are the  
16 categories that have been in place actually since  
17 before '88.

18 And here's the control strategies that  
19 we use. We try to detect the IGSCC before the  
20 damage compromises system integrity. Obviously,  
21 that's what you want as a regulatory body. That's  
22 what we want so we can operate the plant.

23 Remove the defects if you can. We try  
24 to do that, because we don't want that to be a  
25 problem. We prevent initiation by introducing

**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 resistant material. Again, do the replacement, use  
2 L grade piping. Some of it is 316NG.

3 The structural integrity -- we've got to  
4 make sure that that's there. That's just it.  
5 That's all we're going to do. In some cases, we've  
6 used weld overlays to reinforce the material. The  
7 weld overlays also help mitigate the cracking by  
8 putting compressive stresses on the ID.

9 This other -- modifying the residual  
10 stress distribution, it can also be done by using  
11 stress improvement processes, whether it's IHSI,  
12 which is induction heating stress improvement, or  
13 MSIP, which is mechanical stress improvement.

14 And then the last item is to use the  
15 mitigation technologies of water chemistry to slow  
16 things down.

17 If you think back to that slide I had  
18 earlier about the capacity factor losses, that was a  
19 problem in '84. But things have been effective to  
20 slow that down, and that's no longer really an  
21 issue. We've been really effective as an industry  
22 to be able to eliminate the problem.

23 However, continuing to do inspections  
24 creates a dose problem, particularly in those plants  
25 that use hydrogen water chemistry. Something about

**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 the nature of that process causes the dose to go up,  
2 and that's about all I can say about it from a  
3 technology standpoint. We understand that's an  
4 issue.

5 So that was one of the concerns that we  
6 had. We're really saturating people with dose to do  
7 inspections.

8 What the VIP tried to do was we went  
9 back and looked at all of the categories and tried  
10 to figure out what would be appropriate. We looked  
11 at the service experience. We looked at the  
12 deterministic evaluations to evaluate performance.  
13 We looked at inspection results, how effective  
14 hydrogen water chemistry has been, how effect IHSI  
15 and MSIP have been.

16 BWRVIP 61 is a document that discusses  
17 in detail IHSI and the industry survey that we did.  
18 And then we looked at the crack growth studies.  
19 We've developed VIP 14 and other documents and said,  
20 "What do we know now about crack growth?"

21 And we did use some generic risk-  
22 informed studies. We didn't do a risk assessment,  
23 but the different plants that have done risk-  
24 informed ISI, and some of the pilot studies that  
25 were done to develop these code cases, we looked at

**NEAL R. GROSS**

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

(202) 234-4433

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

1 those and tried to learn from them, and said, "Based  
2 on those insights, what makes sense? What is the  
3 right thing to do as we go forward?"

4 So we tried to incorporate all of that.  
5 And here's I guess the crux of what we've done, is  
6 these are the proposed inspection frequencies in 75  
7 for normal water chemistry and for hydrogen water  
8 chemistry. And I guess I should also say for normal  
9 water chemistry what that is today is far superior  
10 to what it was, you know, 15 years ago.

11 The conductivity has been maintained  
12 very low. I think the staff evaluation was that the  
13 average conductivity for the fleet is .15  
14 microsiemens. ECPs are being managed. We're  
15 keeping things under good control.

16 So even normal water chemistry is far  
17 better than what it was. And then, the use of  
18 hydrogen water chemistry would include use of noble  
19 metal. For the purposes of this document, we  
20 considered effective HWC, either hydrogen alone or  
21 hydrogen and the catalyst noble metal.

22 Obviously, without noble metal, we have  
23 to inject greater rates, greater amounts of hydrogen  
24 to be effective. But we've come up with tools to  
25 evaluate that.

**NEAL R. GROSS**

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

(202) 234-4433

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

1                   So those are the revisions to the  
2                   inspection frequencies that we think are appropriate  
3                   based on inspection history and the way things are  
4                   performing.

5                   The status of VIP 75 -- you know, we  
6                   think that the countermeasures that the NRC  
7                   required, and the things that have been implemented,  
8                   have been effective. And we think the inspection  
9                   experience over the last 12 or 13 years shows that.

10                  Some of these welds have been examined  
11                  four or five times since 1988, because of the  
12                  original criteria and the rate that they were  
13                  required to be inspected.

14                  We think there is -- that a revision to  
15                  NUREG-0313 or the generic letter was warranted. We  
16                  put that in VIP 75. And we've got some open items  
17                  the staff has in the safety evaluation that we're  
18                  working on resolution of. One of them is tied back  
19                  to VIP 62, which I discussed earlier.

20                  What is the appropriate level that you  
21                  must reach with your hydrogen injection and your  
22                  water chemistry parameters to have an effective  
23                  water chemistry program? So we're working on that.

24                  And I guess this is what you all would  
25                  like to see -- me conclude.

**NEAL R. GROSS**

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

(202) 234-4433

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

1 (Laughter.)

2 Not my conclusions, but just for me to  
3 conclude.

4 We think that at the direction of our  
5 executives, in response to a problem we had, that we  
6 took ownership of our problem, we developed a  
7 technically sound program that's broad in scope, and  
8 sufficiently in-depth technically to address the  
9 concerns of the BWR internals and the associated  
10 programs.

11 We think we have the appropriate  
12 elements in regard to what we inspect, how often we  
13 inspect, how often we reinspect, the methods that we  
14 use, how we evaluate the flaws, the repair  
15 methodologies that we would use, the mitigated  
16 technologies that we can use to minimize the effect  
17 of IGSCC.

18 And all of that, because we did this for  
19 current term and renewal term to try to address all  
20 known degradation mechanisms, we think it's  
21 appropriate for use for license renewal and have  
22 provided it to the staff as such and have gotten  
23 safety evaluations for it.

24 So that's -- that concludes the overview  
25 of the program and a description. And unless you

**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 have other questions, I would turn it back over to  
2 Mr. Carpenter.

3 MEMBER SHACK: You're proposing to go to  
4 10 percent every 10 years, which is like what the  
5 risk-informed people do, except you want to do it  
6 without actually doing the risk-informed analysis?

7 MR. DYLE: We don't do the detailed  
8 risk-informed analysis, but what we learned from the  
9 risk study is that the real locations of concern  
10 were on ECCS, where you had the potential for  
11 geometric discontinuities or dissimilar metal welds.

12 So we put in VIP 75 that you select  
13 those locations, and that you also select the  
14 locations in the piping that would be problematic,  
15 such as the piping between the dry weld and the  
16 outboard isolation valve. Because from a risk  
17 perspective, if you have a failure there, it's  
18 harder to mitigate that. So we said you are going  
19 to go look at those.

20 So we looked at those generic risk  
21 studies and put some deterministic criteria in for  
22 how to select the welds and addressed it from that  
23 perspective.

24 Any other questions? Thank you.

25 MEMBER SHACK: Thank you.

**NEAL R. GROSS**

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

1 MR. CARPENTER: Okay. Now that Robin  
2 has given a fairly comprehensive overview, I'll  
3 continue on with what the staff has found out or has  
4 come to.

5 We have completed a review of almost all  
6 of the BWRVIP reports to date. There are only a few  
7 more that are left, and we are looking at those.  
8 And, basically, what we've concluded is that  
9 implementation of the BWRVIP guidelines, as modified  
10 to address the staff's comments in our various SEs,  
11 will provide an acceptable level of quality for  
12 inspection of flaw evaluation of the subject safety-  
13 related components.

14 And it should be stressed once more that  
15 the vast majority of the BWRVIP program deals with  
16 components that are outside the scope of the  
17 regulatory required inspections. So this is a  
18 voluntary program that is looking at more than what  
19 the staff has presently required.

20 We've also done -- and this goes back to  
21 an earlier question by the ACRS -- an independent  
22 review by the Office of Research -- that's NUREG-CR-  
23 6677 -- and has found that the BWRVIP program and  
24 other such comprehensive inspection programs will  
25 significantly reduce core damage frequency. And

**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 that's one that I'll provide you a copy with a  
2 little bit later.

3 CHAIRMAN BONACA: Reduce with respect to  
4 what?

5 MR. CARPENTER: I'm sorry?

6 CHAIRMAN BONACA: Reduces it with  
7 respect to what? I mean --

8 MR. CARPENTER: In respect to not having  
9 such a program. If you merely did the required  
10 inspections that are required by the rules and  
11 regulations that the NRC has --

12 CHAIRMAN BONACA: But it doesn't reduce  
13 with respect to the current results of the IPEs. I  
14 mean, they don't assume this kind of failure rates.

15 MR. CARPENTER: That is correct.

16 CHAIRMAN BONACA: Okay.

17 MR. CARPENTER: If you go in and you do  
18 this, you can find things much before you would  
19 otherwise.

20 MEMBER SHACK: This is the PNNL,  
21 essentially, risk-informed inspection kind of  
22 document. Is that what we're talking about here?

23 MR. CARPENTER: INEL. Right. And I  
24 will provide some copies to you a little bit later.

25 What we've done with the generic aging

**NEAL R. GROSS**

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

1 management plans of the BWRVIP, we are completing  
2 the reviews of the various license renewal  
3 appendices for the 12 reports that we're looking at.

4 And what we are finding is that by  
5 referencing the BWRVIP aging management programs and  
6 completing the action items that are in the staff's  
7 SEs for each one of those, that there will be  
8 reasonable assurance that the applicant will  
9 adequately manage aging effects during the extended  
10 operating period.

11 And generic AMPs usage will  
12 significantly reduce staff review of license renewal  
13 applications, and that's one of the things that --  
14 one of the benefits to the staff.

15 Robin mentioned that they've spent over  
16 \$30 million on this program. The BWRVIP has told us  
17 in public meetings that by some of the inspections  
18 that they are doing they are looking to save  
19 somewhere in the neighborhood of about \$100 million  
20 in inspections. This is saving staff resources, so  
21 it's a win-win for both sides.

22 Just to go back over real quickly again  
23 the various I&E documents -- the core spray  
24 internals, the core blade top guide, standby liquid  
25 control (SLC), shroud supports. You've also got the

**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 VIP 41, which we'll be talking about here in a  
2 moment, 42, LPCI, the lower plenum guidelines,  
3 vessel ID attachments, the penetration guidelines.

4 And the reason why I'm telling you this,  
5 again, is just to reinforce that this is a fairly  
6 comprehensive program that we've been looking at.

7 BWRVIP 74 report, which is the BWR  
8 reactor pressure vessel one, is one that the ACRS  
9 has basically looked at before because we came to  
10 you a few years ago and talked to you about the  
11 BWRVIP 05 report, which was the shell weld  
12 inspections. And that has been subsumed by the 74.

13 76, which is the core shroud I&E  
14 guidelines, which I'll be talking about in a moment  
15 -- as Robin mentioned, it includes the VIP 07 and  
16 the VIP 63 documents.

17 And we'll also be talking about some of  
18 the additional reports, which is VIP 75, here in a  
19 moment -- which is supported by the BWRVIP 61 on  
20 induction heating stress improvement effectiveness,  
21 and the BWRVIP 78, which is the integrated  
22 surveillance program, which is supported by the '86  
23 report.

24 There is also a variety of the repair  
25 and replacement design criteria, which we've already

**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 discussed, so I'll just go through this rather  
2 quickly, and also some of the mitigation reports,  
3 which deals with crack growth and how you also  
4 mitigated the VIP 62, which is the hydrogen water  
5 chemistry guidelines.

6 And then, you've got various other ones  
7 -- the VIP 03, which is the internals examinations,  
8 the 06, which was the safety assessment that dealt  
9 with what was the cracking.

10 Now, we're reviewing some of the  
11 proposed guidance in VIP 76, and, as I said, it  
12 incorporates in the BWRVIP 07 guidelines, the VIP 63  
13 guidelines. And what it's basically proposing is  
14 that the weld inspection strategy and unrepaired  
15 shrouds, weld inspection strategy and the repaired  
16 shrouds, the inspection and evaluation reporting  
17 requirements, a demonstration of compliance for the  
18 license renewal rule.

19 And, again, it incorporates 07 and 63,  
20 and right now we are working with the BWRVIP to  
21 resolve some interpretation issues that we found in  
22 the -- between what we said in the 07 document, SE,  
23 and what they understood us to say.

24 BWRVIP 41, jet pump assemblies. We have  
25 completed the plant-specific reviews. Now we're

**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 completing the license renewal review. And,  
2 basically, what we've seen is that the VIP 41  
3 document has -- provides component descriptions,  
4 functions, describes susceptibility factors --  
5 again, all of the things that Robin went through  
6 earlier.

7 MEMBER LEITCH: A question about  
8 BWRVIP 41.

9 MR. CARPENTER: Yes, sir.

10 MEMBER LEITCH: There's a sentence in  
11 there that puzzles me a little bit. It says, "The  
12 VIP 41 report also contains an Appendix A and  
13 demonstration of compliance with the technical  
14 information requirements of the license renewal  
15 rule."

16 MR. CARPENTER: Yes, sir.

17 MEMBER LEITCH: And then it goes on to  
18 say, "Appendix A to the VIP 41 report is not  
19 evaluated in this SE report, but will be evaluated  
20 under a separate license renewal review."

21 MR. CARPENTER: Yes. What we've done,  
22 basically, with all of the I&E guidelines, which is  
23 what constitutes the aging management program, the  
24 generic aging management program for the BWRVIP, is  
25 the staff has taken in these reports. We've

**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 reviewed them. As necessary, we've issued a request  
2 for additional information, RAIs.

3 The BWRVIP has responded back to that.  
4 If there are any additional questions, we have  
5 issued an initial SE with open items, which  
6 basically allows licensees to utilize the document  
7 with these -- with plant-specific addressing of  
8 those open items, while we're still completing the  
9 review.

10 Once the BWRVIP has responded back to  
11 the open items, and we have reached agreement as to  
12 the review, we have issued a final SE, and that  
13 takes care of the present operating term for the  
14 BWRVIP reports. Once that is completed, then we go  
15 in and we take a look at the various license renewal  
16 appendices, which demonstrate how they meet the  
17 license renewal rule, Part 54.

18 MEMBER LEITCH: Okay.

19 MR. CARPENTER: And as long as they meet  
20 Part 54 rules, then we issue a third SE, which is  
21 license renewal SE, a generic SE.

22 MEMBER LEITCH: A generic SE.

23 MR. CARPENTER: As long as the licensee  
24 is showing that they are in compliance with that,  
25 then we don't need to look at their applications

**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 further.

2 MEMBER LEITCH: Okay. Okay. Thank you.

3 MR. CARPENTER: Certainly, sir.

4 One of the things that we found in the  
5 VIP 41 is that there were instances of cast-off  
6 stainless steel components in the jet pump  
7 assemblies that may be adversely affected by high  
8 fluence levels, and that is going to be looked at in  
9 future reviews. So that's going to be resolved  
10 before the license renewal term begins.

11 So preventive actions that are also  
12 discussed in these documents -- obviously, you  
13 maintain high water purity. That reduces stress  
14 corrosion cracking, susceptibility. And also,  
15 again, hydrogen water chemistry and noble metal  
16 chemistry additions will reduce it further.

17 Some of the parameters monitored and  
18 inspected -- the inspection and flaw evaluations  
19 performed in accordance with staff approved  
20 guidelines, and then you go in and, as necessary,  
21 you have examination expansion, reinspection as  
22 necessary, to take a look if you have flaws.

23 And if you detect aging effects, again,  
24 you look at it in accordance with the staff approved  
25 guidelines to ensure that the aging-related

**NEAL R. GROSS**

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

(202) 234-4433

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

1 degradation will be detected before any loss of  
2 intended function occurs.

3 For monitoring and trending, the  
4 inspection schedules in accordance with the VIP  
5 guidelines ensures timely detections of cracks, and  
6 the scope of examination expansion, reexaminations,  
7 will take care of beyond baseline inspections if you  
8 do have flaws.

9 For acceptance criteria, degradation is  
10 evaluated in accordance with the approved VIP  
11 guidelines, staff approved guidelines I should say.

12 For corrective actions, you have the  
13 repair design criteria if you need to do repairs,  
14 and the staff is in the process of approving those  
15 also -- again, with some open items in those.

16 And, again, as far as operating  
17 experience, as Robin mentioned, you've had several  
18 instances in the past 20 years where the jet pumps  
19 have had some problems.

20 Staff has completed its review of the  
21 VIP 26 guidelines. The scope of the program is  
22 pretty much as Robin described earlier. So go  
23 through that.

24 The VIP 26 document, the aging  
25 management programs, the 10 elements are similar to

**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 what was in the VIP 41 review. So I really don't  
2 need to go through that again.

3 And the operating experience -- again,  
4 we've had cracking found at various locations over  
5 the years. And they have also been observed in the  
6 Swedish BWR, which I believe Dr. Shack mentioned  
7 earlier.

8 Going into VIP 75, the technical basis  
9 -- now, this is where we change stride here.  
10 Basically, the I&E guidelines are what constitutes  
11 the aging management program, the generic aging  
12 management program for the fleet. But the VIP 75  
13 and some of the other documents are intended to be  
14 applicable at any time in operating life, be that  
15 year 39 or year 59.

16 So there is no license renewal SE that  
17 will be issued on this one. Once the final SE is  
18 issued, and we've gotten the BWRVIP 75-A document,  
19 licensees will be able to utilize it at any time.

20 Robin discussed some of the revisions to  
21 the extent of the frequency, and why it's based on  
22 considerations of inspections.

23 And, again, we went through how they are  
24 specifically applicable to inspections, but our SE  
25 is not applicable to any other welds. We need to

**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 stress that. It's only applicable to the Generic  
2 Letter 88-01/NUREG-0313 welds. So this is not going  
3 beyond the scope of that.

4 CHAIRMAN BONACA: Here you -- your  
5 previous slide you talked about extent and frequency  
6 for piping inspections contained in GL 88-01. That  
7 is the first time I see this issue of frequency of  
8 piping instruction. Does it imply that -- that the  
9 frequency changes with time?

10 MR. CARPENTER: I'm sorry, sir. Could  
11 you repeat that?

12 CHAIRMAN BONACA: If you go to the  
13 previous slide, the BWRVIP 75 report proposes  
14 revisions to extent and frequencies for -- plant  
15 frequencies. I mean --

16 MR. CARPENTER: Yes.

17 CHAIRMAN BONACA: -- could you comment  
18 on that? Frequencies -- what --

19 MR. CARPENTER: Yes. Basically, gain,  
20 the BWRVIP 75 report proposed to reduce the amount  
21 of inspections that were necessary.

22 CHAIRMAN BONACA: Okay.

23 MR. CARPENTER: And this is for the low  
24 fluence regimes. Okay? Again, once you get into  
25 the high fluence regimes where you go into less

**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 hydrogen water chemistry, you drop out of that and  
2 go into normal water chemistry, the inspection  
3 frequencies will increase. So the frequencies are  
4 being reduced because the inspection results through  
5 the years and the mitigations that have been  
6 occurring have been improving it.

7 Once you find that your cracking is  
8 increasing or is occurring, you expand that. So  
9 it's not that you're forever reducing. There will  
10 be a time when you will be inspecting more.

11 CHAIRMAN BONACA: Okay. So there is  
12 some consideration -- yes. Okay.

13 MR. CARPENTER: Anything else, sir?  
14 Okay.

15 Basically, the scope of the program was  
16 that it provided a summary of the generic letter, it  
17 discussed the use of hydrogen water chemistry to  
18 inhibit initiation and growth of IGSCC, it proposed  
19 revised inspection criteria and associated risk  
20 considerations, much as we've just discussed.

21 The staff issued the SE with several  
22 open items, and those included proposed inspection  
23 frequency and scope of the category A, B, C, and E  
24 welds. We didn't precisely agree with the BWRVIP on  
25 those.

**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           We also requested more in the way of  
2 sample expansion, and we talked about reactor water  
3 coolant conductivity and what was necessary for  
4 that, what exactly constituted an effective hydrogen  
5 water chemistry and noble metal chemistry addition  
6 programs, and also just how do you identify safety-  
7 significant locations. And that's all in the SEs  
8 that we provided to you.

9           And we have met with the BWRVIP. Just  
10 last week we discussed this, and they're going to be  
11 coming in with a response to that SE here in the  
12 near term.

13           Again, the staff has the VIP 75 guidance  
14 to be acceptable except for the open items, and the  
15 revised 75 report can be used by licensees to  
16 replace inspection guidance and Generic Letter 88-  
17 01. And several licensees have already started  
18 making use of that revised guidance addressing the  
19 open items as necessary.

20           And we believe that this will provide  
21 reasonable assurance for integrity of the subject  
22 BWR piping welds.

23           In conclusion -- the reason I'm going so  
24 fast is because Robin took care of the majority of  
25 the information that we wanted to provide to you --

**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 we have found that referencing the VIP aging  
2 management program, including the staff required  
3 action items, will provide reasonable assurance that  
4 applicants will adequately manage the aging effects  
5 during the extended operating period, and that the  
6 generic AMPs will significantly reduce staff reviews  
7 of license renewal applications.

8 I believe that will be borne out when  
9 you talk with the people tomorrow on Hatch regarding  
10 how much was reduced on that.

11 And that concludes my presentation. Any  
12 questions?

13 CHAIRMAN BONACA: Well, I just had  
14 question maybe for both presenters. And I just  
15 mentioned it before; I still am belaboring on this  
16 issue. You know, the oldest program says that, you  
17 know, you identify these materials which have  
18 different susceptibility to cracking.

19 And then for the less susceptible it  
20 will be every 10 years you perform an inspection.  
21 For the more susceptible locations, all materials  
22 you do it every six years.

23 You maintain a step up to 60 years, or  
24 can maintain it to 100 years I guess. It's  
25 counterintuitive to me that, as you continue to age

**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 this material, you would expect to need the same  
2 frequency of inspections. I mean, I just -- maybe  
3 my material expert colleagues here could help me  
4 with that, particularly where you have this  
5 susceptible material in a susceptible region, high  
6 fluence.

7 MEMBER SHACK: Well, no, this is piping  
8 inspection.

9 CHAIRMAN BONACA: Yes. Well --

10 MEMBER SHACK: So you're not  
11 accumulating any fluence in this piping.

12 CHAIRMAN BONACA: No. I thought that,  
13 however, there are also intervals of inspections for  
14 intervals, for example, that would also have the  
15 step-wide frequency.

16 MEMBER FORD: Essentially, your concern,  
17 Mario, is that -- your concern is that the  
18 assumption is that the damage is occurring literally  
19 over time.

20 CHAIRMAN BONACA: Yes.

21 MEMBER FORD: And if it's occurring  
22 exponentially with time, then having it every four  
23 years or 10 years is inappropriate.

24 CHAIRMAN BONACA: Well, at some point,  
25 it seems to me that because --

**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 MEMBER SHACK: It's not only linear in  
2 timing, because it suddenly bounces up to 5 times  
3 10 --

4 MEMBER FORD: But it's just because  
5 you've seen it. It's kind of up to NTE resolution  
6 on --

7 CHAIRMAN BONACA: The only thing is --  
8 the rest I think is -- I'm very comfortable with the  
9 fact that there has been a very careful look at  
10 every component, every location, every environment,  
11 and it can -- you know, I think it's a very thorough  
12 effort.

13 It just still -- and I guess if there is  
14 an acceleration of damage being experienced, there  
15 will be some response coming at some point for that.  
16 And so --

17 MR. CARPENTER: Well, if I could echo  
18 what Robin said earlier, if you're looking at some  
19 of these components, and you see degradation  
20 occurring at an increased frequency, obviously, what  
21 we have been trying to do in some of these reviews  
22 is that you were going to do scope expansion and  
23 frequency expansion.

24 So as things -- if things, I should say,  
25 begin to crack and degrade in greater frequency over

**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 the years, the VIP program is pretty much a living  
2 program. It's not once you've done it you put it on  
3 a shelf and you're complete with it.

4 The staff has been working with them on  
5 this. If need be, we will be going back to the  
6 BWRVIP and saying, "We need to revisit some of these  
7 inspection frequencies and scopes."

8 MEMBER KRESS: That concept of  
9 increasing the frequency based on what you see puts  
10 a great deal of emphasis on the first frequency, the  
11 first inspection frequency. How was that arrived  
12 at? Did you have -- the six years, for example.

13 You know, if you're looking for linear  
14 extrapolation and want to be sure it doesn't go up  
15 exponentially, and you're looking at frequency of  
16 inspections to keep you away from that, you know, a  
17 whole lot rides on that first frequency that you  
18 choose. And I was just wondering how that was  
19 chosen.

20 MR. DYLE: If I could maybe try to help  
21 with that. Maybe the way the presentation went made  
22 it look like it was a decision on a discrete  
23 component basis, and that's really not the case.

24 You know, when we looked at how often  
25 should we inspect something that has, for example,

**NEAL R. GROSS**

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

1 182 weld metal, we looked at all of the components.  
2 We said, "Have we seen cracking anywhere? What's  
3 the industry-wide experience? What's the behavior  
4 of this stuff?" If it should crack, how fast would  
5 it grow? If I don't find it today --

6 MEMBER KRESS: That's the key right  
7 there.

8 MR. DYLE: Right.

9 MEMBER KRESS: You have a model for how  
10 fast it will grow.

11 MR. DYLE: Right. And those were things  
12 that we took into consideration. If I look today  
13 and it cracks tomorrow and starts growing, what's a  
14 reasonable inspection frequency to look again to  
15 ensure integrity?

16 MEMBER KRESS: So the -- that first one  
17 -- decision on how long to wait for the next  
18 inspection depends on the crack growth model or  
19 crack initiation model. And the question I have is,  
20 is there any reason to expect those to be linear?

21 MR. DYLE: No, not necessarily. We  
22 tried to be conservative. If you look at some of  
23 the components -- and we did this -- and you said,  
24 "Well, if I have a crack today," and using, let's  
25 say, in VIP 14 for the crack growth rate for

**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 stainless steel that's not irradiated, you could  
2 justify an inspection frequency of 20 years.

3 We'd say, "Well, that's -- that doesn't  
4 make sense." So --

5 MEMBER KRESS: So we're -- over a short  
6 time, linear is a good enough approximation is what  
7 you're saying.

8 MR. DYLE: It would seem to be. And  
9 then, again, as Gene said, we called it a living  
10 program. If we find a problem in stainless that's  
11 welded -- I don't know, pick a component -- to core  
12 spray, if we find something new, we say, "All right.  
13 What's the impact on that of every other location  
14 that's got stainless material that's welded?" We  
15 need to revisit everything.

16 CHAIRMAN BONACA: The other key thing  
17 that comes to mind now is you have about 30 or 40  
18 plants in the program.

19 MR. DYLE: That's right.

20 CHAIRMAN BONACA: So, really, you are  
21 having probably --

22 MEMBER KRESS: So you're having  
23 inspections, really, pretty often, naturally. When  
24 you look at the population --

25 MEMBER SHACK: Even there, when the guy

**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 inspects his pipes, it's not as though he doesn't  
2 inspect the pipe, you know, in 10 years, and then he  
3 suddenly goes in the next outage and looks at it.  
4 You know, he's got to look at all of the welds over  
5 the 10 years. He's looking at a sample --

6 MEMBER KRESS: So spreading them out.

7 MEMBER SHACK: Right. And when you do  
8 that on a plant-wide basis, you've actually got a  
9 pretty good sample of things going on. I mean, you  
10 know, the alternative to an expansion rule is to  
11 somehow pretend you really understand this well  
12 enough.

13 (Laughter.)

14 CHAIRMAN BONACA: I hope you're --

15 MEMBER SHACK: I prefer the expansion  
16 rule myself.

17 (Laughter.)

18 CHAIRMAN BONACA: I hope you would. No,  
19 but I think the sheer number of plants involved in  
20 the program, and the sharing and communication of  
21 information, is sufficient, give a lot more comfort  
22 because you essentially have, on average, three or  
23 four inspections a year.

24 MR. DYLE: Right. And we hope that --  
25 and maybe I wasn't clear in the beginning of the

**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 presentation. But by giving this semi-annual update  
2 of what's happened, it allows the staff to  
3 independently assess the adequacy of the program  
4 also.

5 So we're willing to accept that  
6 feedback, and this -- this has been a good effort  
7 where we could do what we thought was the right  
8 technical thing, and the staff comes back. We're  
9 not worrying about licensing arguments, so we hope  
10 to keep that relationship.

11 MR. CARPENTER: And I didn't bring a  
12 copy of what Robin was just talking about, but the  
13 semi-annual inspection and summary that the BWRVIP  
14 provides to us is approximately, you know, a  
15 quarter-inch thick. So we do have a very large  
16 database that we are accumulating, and that has been  
17 coming to us for the last four or five years now.

18 Any other questions?

19 CHAIRMAN BONACA: Any more questions for  
20 Mr. Carpenter?

21 MEMBER KRESS: Are we writing a letter  
22 on this?

23 CHAIRMAN BONACA: Well, we plan to  
24 address the review of this, you know, as part of the  
25 Hatch application. The Hatch application references

**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 these reports. So we did pretty much what we did  
2 originally for, for example, the use of the B&W  
3 topical in support of the Oconee application.

4 MEMBER KRESS: But we haven't reviewed  
5 these models -- plant growth and initiation, on  
6 which a lot of this relies on. Can we make  
7 judgments without reviewing those models and the  
8 database that underlies them? Or we just rely on  
9 Bill and Peter to tell us it's okay? Or --

10 MEMBER SHACK: The staff has written  
11 SEs.

12 MEMBER KRESS: Okay. Well, the staff  
13 has got an SER. Why don't we -- I mean, that  
14 doesn't --

15 CHAIRMAN BONACA: We have reviewed only  
16 a sample of SERs.

17 MEMBER SHACK: Yes. I mean, it's like  
18 our whole review of the license renewal process. I  
19 mean, we don't review every SER of every supporting  
20 document.

21 MEMBER KRESS: We rely on the staff's --

22 MEMBER SHACK: Well, I mean, you sort of  
23 try to sample I guess is what we've done.

24 CHAIRMAN BONACA: Yes.

25 MR. DURAISWAMY: That's what you did,

**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 Tom. This time we really picked four reports. I  
2 think, Bill, you got two, and Graham got one, and  
3 John got one. So you guys, you know, found it  
4 satisfactory? Any problems?

5 MEMBER SHACK: Yes.

6 MEMBER KRESS: I did, too.

7 MEMBER LEITCH: Yes.

8 CHAIRMAN BONACA: Okay. So that's all  
9 we can do -- sample it.

10 MEMBER KRESS: Yes. But the whole  
11 committee has to sample it.

12 MR. DURAISWAMY: Well, and the next --  
13 next BWR plan comes in, I think we will take  
14 probably about 10 reports and give one to each  
15 member.

16 MEMBER KRESS: Give all 10 of them to  
17 each member.

18 MR. DURAISWAMY: Well, we can do that,  
19 too. So -- we can do the other thing, Tom. It's  
20 going to be tough.

21 MEMBER KRESS: I know particularly in  
22 this area, it's -- this is a tough area.

23 MEMBER SHACK: Yes. I mean, you can  
24 count the number of man-years they spend on this,  
25 and then you -- you know, you go around and you try

**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 to figure out how we're going to do it.

2 (Laughter.)

3 MEMBER FORD: Could I ask a question of  
4 clarification? It relates to your crack growth  
5 disposition algorithms. Are we using 5 times  $10^{-5}$   
6 inches per hour?

7 MR. CARPENTER: We are using that for  
8 the majority of the cases, and any time you get  
9 above the threshold fluence level inside the reactor  
10 vessel for  $5E^{-5}$  inches per hour is what we're using.  
11 In some cases, we have reduced the crack growth rate  
12 because the BWRVIP has been able to show that there  
13 is a case to do so.

14 MEMBER FORD: So this five times  $10^{-5}$   
15 for both higher rated and not -- it's five times --

16 MR. DYLE: If I could, BWRVIP 14, which  
17 is the statistical correlation, sets a new  
18 disposition line at -- I think it's  $2.2E^{-5}$  for  
19 disposition purposes. And that's based on the  
20 statistical review of the data, plus with some input  
21 from GE with their verification in another way that  
22 that was an acceptable disposition curve to be used.

23 MEMBER KRESS: Is that the main line, or  
24 is that a 95 percentile line through the data?

25 MR. DYLE: 95.95.

**NEAL R. GROSS**

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

1 MEMBER KRESS: 95.95. Okay.

2 MR. DYLE: Of the data.

3 MEMBER SHACK: You've got to remember,  
4 first you look at the crack growth curve, and then  
5 you have to look at the stresses. And so, you know,  
6 what they've done is sort of taken --

7 MEMBER KRESS: All the data.

8 MEMBER SHACK: -- an approximate -- you  
9 know, a conservative crack growth curve, and then  
10 what is for most cases an approximate stress-  
11 intensity value, and picked it there. You know, I  
12 think you would have to argue that it's an  
13 engineering judgment rather than a statistical  
14 model, because it's very hard to characterize the  
15 stress distributions.

16 You know, you can do something with the  
17 crack growth curve, but then you still have to make  
18 a judgment.

19 MEMBER KRESS: I thought the crack  
20 growth curve had inherent in it the stress.

21 MEMBER SHACK: No. It says that for a  
22 given stress intensity I get a crack growth rate.  
23 But then I have to decide what the stress intensity  
24 is at this weld at this point.

25 MEMBER KRESS: Oh. The data is not --

**NEAL R. GROSS**

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

1 is data taken in the laboratory for a given -- where  
2 you impose an intensity and a chemical --

3 MEMBER SHACK: Right. Because it's the  
4 only way you can do it. I mean, because it does  
5 depend on the stress intensity. You have to have  
6 the crack growth rate depend on the stress  
7 intensity.

8 MEMBER KRESS: And you have a  
9 laboratory-based model.

10 MEMBER SHACK: Which means, then --  
11 well, even if it wasn't a laboratory-based, it means  
12 if you did a field measurement you would have to  
13 know what the stress is in that weld.

14 MEMBER KRESS: Well, I --

15 MEMBER SHACK: So I get out stress  
16 meter --

17 MEMBER KRESS: Not if you put all the  
18 data on a curve and took the 95.95. That would take  
19 care of it. But if it were all field data -- that  
20 was where I was confused. It's not field data,  
21 though, you're talking about.

22 MEMBER SHACK: Even the field data --  
23 you know, then, you have to decide when the crack  
24 started growing.

25 MEMBER KRESS: Yes. Of course, you'd

**NEAL R. GROSS**

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

1 have to have the data. Yes.

2 MEMBER FORD: I think that this present  
3 discussion arises out of the comments that you all  
4 made. Does the ACRS write an approving letter, or  
5 whatever it is that we write, for this methodology?

6 MEMBER KRESS: Well, I think what we do  
7 in the case of this license renewal is to say the  
8 ACRS has looked at the staff's SER and the staff's  
9 procedure, and we approve the procedures. But we  
10 don't -- I think we keep hands off on saying we  
11 approve the license --

12 MR. DURAISWAMY: No, it doesn't say --  
13 just the word "approve," yes.

14 MEMBER KRESS: Yes, we don't approve .  
15 license renewal. We agree with the staff's --

16 MR. DURAISWAMY: Exactly.

17 MEMBER KRESS: -- has done a good job of  
18 SER, and that the procedure is okay. I think that's  
19 the way we have to deal with it, but we can't  
20 approve all of this.

21 MEMBER FORD: Well, I was about to  
22 follow it up with another comment on -- that there  
23 has been a fair amount of discussion within industry  
24 about the methodology used for coming up with these  
25 statistically-based algorithms, which then, in turn,

**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 depends on the quality of the data upon which they  
2 are statistically derived -- however those are  
3 derived. And there will always be arguments along  
4 those lines.

5 The question I'm really asking the staff  
6 is, are they happy that that disposition curve is a  
7 safe disposition curve? In other words, there have  
8 been very few data points which exceed that value  
9 of, what, 2.2 or -- steady state value of 2.2 times  
10  $10^{-5}$ . That is the -- as far as the safety point of  
11 view. Forget the specifics of, you know, whether  
12 you agree with the methodology.

13 So the question is: are the staff -- is  
14 the staff happy that this statistically-derived  
15 disposition algorithm is a safe upper-bound value?

16 MEMBER KRESS: I think if you read his  
17 last conclusion on the slide, you would have to say  
18 that, yes, they're happy with it.

19 MEMBER FORD: Yes.

20 MR. CARPENTER: The staff hasn't seen  
21 that. The staff has approved the BWRVIP 14 document  
22 with several caveats, which are being addressed by  
23 the BWRVIP.

24 MEMBER FORD: Okay.

25 MEMBER SHACK: So, basically, for

**NEAL R. GROSS**

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

1 application to low irradiation levels, they have  
2 accepted that.

3 MEMBER FORD: As a conservative.

4 MEMBER SHACK: As conservative, right.

5 CHAIRMAN BONACA: The heart of the  
6 license renewal rule is that you have adequate  
7 programs to inspect passive components to assure  
8 that you can manage aging degradation.

9 You know, so there is -- I think that  
10 you are -- the way I see it, it addresses the issue  
11 of looking at specific locations, looking at the  
12 environment in those locations, conditions for the  
13 aging effects there may be on those components, and  
14 establishing inspections and repair techniques and  
15 approaches.

16 And so I think in that sense, really, it  
17 seems to be totally in agreement with the license  
18 renewal steps that you have not questioned, that  
19 really we have not explored in detail for each one  
20 of the locations, etcetera, as the correlations.  
21 And, therefore, the timing of the inspections, for  
22 example, and we haven't -- we can't comment on that,  
23 except for the specific four examples that we  
24 reviewed.

25 But we can conclude that the process is

**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 really in line with the license renewal process.

2 MEMBER KRESS: Yes. And I think that's  
3 what we ought to -- Bill, you mentioned that the  
4 correlations were conservative for non-irradiated  
5 material. Does the database include radiated  
6 material? That seems like a pretty tough laboratory  
7 assignment to get --

8 MEMBER SHACK: Well, that's why it gets  
9 a lot higher when you have irradiated materials.

10 MEMBER KRESS: But do we have data on  
11 that?

12 MEMBER SHACK: You have very limited  
13 data, which is why you have to make conservative  
14 assessments.

15 MEMBER KRESS: I can see how it would  
16 have to be, yes.

17 MR. DURAISWAMY: We're trying to get --

18 MR. DYLE: We're trying to gather data  
19 from different -- we've leveraged our money. We've  
20 bought into different research programs, so we can  
21 obtain data, say, for Halden and other activities.

22 GE has worked to develop that. And as  
23 soon as we have something that is usable that we  
24 think justifies a change in rate or a better  
25 definition of the rate, we'll give that to the staff

**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 for their review. But we understand that that's  
2 something that we've got to deal with.

3 We're looking at fracture toughness  
4 also. There are some irradiated issues that we need  
5 to deal with and understand.

6 CHAIRMAN BONACA: Any other comments?

7 Let's talk just briefly about two  
8 things. One is, again, the way we view -- the way  
9 we view this review of the BWRVIPs. In the letter  
10 for Hatch, is there any other insight to provide  
11 here? Or shall we just treat them the way we  
12 treated the B&W topical for the Oconee application?  
13 I would say that would be the approach that I would  
14 propose. Any other --

15 MEMBER LEITCH: Have you picked your two  
16 -- that is, one letter dealing with the BWRVIP  
17 program, and another letter dealing with the Hatch  
18 license renewal application that references this.

19 MR. DURAISWAMY: No. I think I  
20 better --

21 MEMBER LEITCH: Because this is going to  
22 be used much more widely than Hatch in the future,  
23 right?

24 MR. DURAISWAMY: Yes. But, Graham, I  
25 think in the Hatch application, you know, they're

**NEAL R. GROSS**

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

(202) 234-4433

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

1       referencing, what, close to 20 reports? How many?

2               MR. CARPENTER: Can you tell me --  
3       you've got something like -- well, almost every one  
4       of the I&E documents --

5               MR. DYLE: Yes, for the -- and you would  
6       have referenced 01, 07, 63, and then 76, which is  
7       really just one document, but there's four  
8       references. So we've referenced all the I&E  
9       documents where applicable.

10              An example would be core plate we  
11      didn't, because we've installed wedges. So by --  
12      although we considered the scope of that, we looked  
13      at the core plate and said, "What does the VIP  
14      require that we do?" the answer was nothing, because  
15      we've installed the wedges. The core plate can't  
16      move should the bolts fail. So that's not  
17      specifically referenced but it was concerned.

18              The Hatch commitment is to implement the  
19      VIP documents as the NRC SE specifies or we'll  
20      notify the staff of changes that we need to make to  
21      do that. That's in the application, and that's the  
22      direction we're headed.

23              MEMBER LEITCH: But my question is, when  
24      the next BWR comes in, what do we do about that?

25              CHAIRMAN BONACA: See, their burden is

**NEAL R. GROSS**

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

1 to demonstrate that the topical -- these topical  
2 reports are applicable to their plant, the  
3 application they propose. That's what the staff is  
4 supposed to review.

5 And, again, on our part, it's to assure  
6 that we feel comfortable that the staff has  
7 performed the verification. Granted, we are  
8 approving -- we're not approving -- we're using or  
9 referencing these BWRVIPs in our review of the  
10 individual applications, with no complete review on  
11 our part of all the topicals.

12 We really have reviewed only four, and  
13 we have reviewed the staff presentations and the SER  
14 provided by the staff. But this is not unlike other  
15 things that we do -- we do reference in our review  
16 of the applications and the SERs.

17 I don't know -- I know that there are a  
18 number of others that will receive separate  
19 evaluations that aren't completed -- totally  
20 completed yet. Do we have any plan to review those  
21 when they come through? I don't think so.

22 MR. DURAISWAMY: No. I think the next  
23 -- you know, next time, I think we've got to pick  
24 and choose, you know, some additional reports, you  
25 know, important reports. I think we can do -- when

**NEAL R. GROSS**

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

(202) 234-4433

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

1 the staff has completed the safety evaluation, so  
2 you've got to do the same thing what we did this  
3 time. You know?

4 So Tom is willing to, you know, look at,  
5 you know, some more reports. And I think --

6 MEMBER SHACK: Well, for example, the  
7 important one will be the hydrogen water chemistry,  
8 because that will be fundamental to a major change  
9 in inspection frequency. And so, you know, I think  
10 when the SE for that one comes out, for example,  
11 that would be one that would -- we would want to  
12 look at.

13 CHAIRMAN BONACA: Yes. I think what we  
14 should plan to do probably is to reflect on that,  
15 think about it, and then make a little plan on our  
16 part on what we're going to review and under what  
17 kind of conditions. It may be that we do it for the  
18 next BWR license renewal committee that we have.

19 MR. ELLIOTT: Peach Bottom is only six  
20 months away, or less. They're coming in this  
21 summer, I believe.

22 CHAIRMAN BONACA: Okay. Now, the second  
23 issue I would like to talk about briefly is, what  
24 are we asking the staff to come and tell us about  
25 this at the next meeting next week for the full

**NEAL R. GROSS**

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

(202) 234-4433

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

1 meeting? I would expect that we will have some  
2 condensed presentation as part of the Hatch  
3 application. So that's really the way we're going  
4 to address the BWRVIPs anyway.

5 MEMBER KRESS: What do we have, two  
6 hours?

7 MR. DURAISWAMY: How much time? I  
8 forgot. Yes. We get two hours for Hatch and --

9 MEMBER KRESS: Yes. But how much time  
10 do we have --

11 MR. DURAISWAMY: No, but -- yes, for the  
12 -- and the guidance documents and -- we have an hour  
13 and 10 minutes.

14 MEMBER KRESS: Okay.

15 CHAIRMAN BONACA: My suggestion is that  
16 we try to stay within the schedule. We may need  
17 less time for the guidance documents.

18 MR. DURAISWAMY: Yes. But they are --  
19 all of things are included under Hatch. You know,  
20 so we can -- you know, they can address, you know,  
21 some of these things at that time.

22 CHAIRMAN BONACA: Okay. So we will have  
23 -- we will need a summary of the -- from the staff  
24 of this effort, the BWRVIP report that has been  
25 produced, and they are referenced in the application

**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 for Hatch, and then some summary of -- I guess I'm  
2 wrestling right now with the time available to us  
3 for that presentation, which is limited.

4 So what do you think will be interesting  
5 to the other three members which are not here right  
6 now?

7 MEMBER FORD: Could I ask, what's the  
8 expectation of the meeting next week for the Hatch?  
9 Are we expected to come up with an approval?

10 CHAIRMAN BONACA: No. We are going to  
11 have a report on this SER, which still has open  
12 items. So, therefore, we will have an opportunity  
13 to review it again. But this is a time when we can  
14 provide some feedback if there is feedback we want  
15 to provide.

16 MEMBER FORD: Okay.

17 CHAIRMAN BONACA: So -- yes, my  
18 suggestion is that we will probably commit to maybe  
19 half an hour of the whole presentation dedicated to  
20 the BWRVIPs with -- probably the best way would be  
21 to start with those two figures of the core and the  
22 components, so that there is an overview for the  
23 other members of what components we're talking about  
24 here. Very briefly, the kind of failure experience,  
25 the program that was implemented to address these

**NEAL R. GROSS**

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

(202) 234-4433

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

1 failures.

2 I certainly think that the members  
3 should see, one, the population of the BWRs involved  
4 in this. The other way -- the other thing you  
5 should present is the -- the unavailability of the  
6 -- how much it has gone down since 1984, which  
7 definitely speaks of a success story for the program  
8 which has been implemented to test those.

9 And then, I think that I would focus  
10 purely on the four BWRVIPs that we chose, which I  
11 believe are pretty central. They were regarding  
12 internals -- you know, the --

13 MR. BARTON: Jet pumps and --

14 CHAIRMAN BONACA: -- the jet pumps, the  
15 shroud, the --

16 MR. BARTON: -- top guide.

17 CHAIRMAN BONACA: -- top guide.

18 MR. BARTON: And Class I piping.

19 CHAIRMAN BONACA: That's fine.

20 MEMBER SHACK: But, still, in a half an  
21 hour, you can barely do more than mention the  
22 titles.

23 CHAIRMAN BONACA: Well, I mean, I will  
24 be expecting only to see some conclusions as far as  
25 inspection frequency. I don't think we want to have

**NEAL R. GROSS**

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

(202) 234-4433

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

1 more than that. For Oconee, when we have the -- I  
2 don't think we had almost any presentation of the  
3 B&W topical reports.

4 MEMBER SHACK: No, we didn't.

5 CHAIRMAN BONACA: We didn't. Are you  
6 suggesting we don't have it?

7 MEMBER SHACK: No. I guess I would  
8 focus on primarily how successful the program has  
9 been in, as you say, reducing the outages, and, you  
10 know, the sort of incidence of cracking.

11 CHAIRMAN BONACA: Yes.

12 MEMBER SHACK: And, you know, which is  
13 in a way the proof of the effectiveness of the  
14 program. Whatever you may argue about, you know,  
15 what we understand and what we don't understand, you  
16 know, we're just not getting nearly as much cracking  
17 anymore.

18 CHAIRMAN BONACA: And, again, focusing  
19 on the fact that the outcome of all this work really  
20 is a number of guidelines which seem to pattern  
21 exactly the -- for example, what you find in GALL  
22 for other components. Okay? So, essentially, the  
23 rate of inspection required, etcetera, etcetera, the  
24 programmatic requirements of license renewal.

25 MR. CARPENTER: Well, bear in mind GALL

**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 relies heavily on the BWRVIP program for the  
2 internals, so --

3 CHAIRMAN BONACA: And that fits right  
4 into that.

5 MR. CARPENTER: Right.

6 CHAIRMAN BONACA: So it will be almost a  
7 presentation, you know, within that context.

8 MR. CARPENTER: Yes.

9 CHAIRMAN BONACA: You said a half an  
10 hour cannot provide much, but the -- I don't think  
11 we should spend more than half an hour on that,  
12 because there are many other issues we need to  
13 discuss.

14 MEMBER SHACK: No. You can't give more  
15 than half an hour.

16 CHAIRMAN BONACA: Maybe 20 minutes,  
17 whatever.

18 MEMBER KRESS: Take a look at Mr. Dyle's  
19 conclusions slide. He's got three major  
20 conclusions. The scope is all-inclusive and broad,  
21 and that it includes the appropriate elements,  
22 including inspection evaluation, repair, and  
23 mitigation. And that the program has been  
24 successful, and so forth.

25 If you could choose slides to illustrate

**NEAL R. GROSS**

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

(202) 234-4433

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

1 those three conclusions --

2 MR. BARTON: We just have one slide that  
3 talks about how you looked at risk, so that will  
4 save George a 30-minute tirade on the --

5 MEMBER KRESS: Yes. We had less than --  
6 we had one bullet on this.

7 MR. BARTON: At least one bullet on it.

8 MEMBER KRESS: But, anyway, you know, if  
9 you could -- if you could come up with some much  
10 shorter supporting slides for those three  
11 conclusions, it would be a good approach I think. I  
12 think, actually, you can go in here and choose some  
13 that would fit in a time period. Might be able to  
14 do it.

15 CHAIRMAN BONACA: Okay.

16 MEMBER KRESS: I think those are  
17 conclusions they'd like to know.

18 CHAIRMAN BONACA: Sure.

19 MEMBER KRESS: Things they'd like to  
20 know about.

21 CHAIRMAN BONACA: Okay. You'll be  
22 providing that, or somebody?

23 Okay. Any other comments? If there are  
24 no further comments, I think we are ready to adjourn  
25 the meeting today.

**NEAL R. GROSS**

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

1 MR. DURAISWAMY: Yes. This meeting  
2 tomorrow is a different --

3 MEMBER KRESS: You're adjourning this  
4 meeting and you want to start a new one tomorrow.

5 CHAIRMAN BONACA: Okay. We'll start a  
6 new one tomorrow -- the Hatch application.

7 Okay. If nothing -- no comments from  
8 the public? Okay. The meeting is adjourned.

9 (Whereupon, at 4:15 p.m., the  
10 proceedings in the foregoing matter were  
11 adjourned.)

12

13

14

15

16

17

18

19

20

21

22

23

24

25

**CERTIFICATE**

This is to certify that the attached proceedings  
before the United States Nuclear Regulatory Commission  
in the matter of:

Name of Proceeding: ACRS PLANT LICENSE RENEWAL

Docket Number: (NOT APPLICABLE)

Location: ROCKVILLE, MARYLAND

were held as herein appears, and that this is the  
original transcript thereof for the file of the United  
States Nuclear Regulatory Commission taken by me and,  
thereafter reduced to typewriting by me or under the  
direction of the court reporting company, and that the  
transcript is a true and accurate record of the  
foregoing proceedings.



Rebecca Davis  
Official Reporter  
Neal R. Gross & Co., Inc.

**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)

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
SUBCOMMITTEE MEETING ON PLANT LICENSE RENEWAL

MARCH 27, 2001

Date

ATTENDEES - PLEASE SIGN IN BELOW

PLEASE PRINT

NAME

AFFILIATION

MUNG Y. LIN

ANL

Omesh Chopra

ANL

Shiu-Wing Tam

ANL

JOHN RYCYNA

~~CMS~~

Wayne Luncford

SNL

Rich Morante

BNL

JOSEPH BRAVERMAN

BNL

ROBERT LOFARO

BNL

DOUG WALTERS

NEI

ERACH PATEL

EXELON

Donald Ferrara

Winston & Strawn

Ch.

David C. Jeng

NRC/NRR

David L. Solbrig

NRC/NRR

Tanya M. Egan

NRC/NRR

Steven G. Toney

CONSTELLATION NUCLEAR

Amy Cubbage

NRC/NRR/SRxB

Muhammad A. Razaqpur

NRC/NRR/SRxB

Robin Dyle

SOUTHERN NUCLEAR

ROBERT CARTER

EPRI

R. D. BAKER

SOUTHERN NUCLEAR

# ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

## SUBCOMMITTEE MEETING ON PLANT LICENSE RENEWAL

MARCH 27, 2001

Date

### NRC STAFF SIGN IN FOR ACRS MEETING

PLEASE PRINT

NAME

AFFILIATION

John VORA

NRC / RES / DET

John J. Lang

NRC / DRIP / MSLB

MANNY COMAN COMAN

NRC / DRIP

SAM LEE

NRC / NRR / DRIP / RLSB

Stephen Koenick

NRC / DRIP / RLSB

PAUL shemanski

NRC / NRR / DE / EGIB

S. K. MITRA

NRC / NRR / <sup>DRIP</sup> / ~~DE~~ / ~~EGIB~~ / RLSB

G. S. Galletti

NRC / DRIP / IQPB

Pei-Ying Chen

NRC / NRR / DE / EMEB

Michael McNeil

NRC / RES / DET / MEB

P T KUO

NRC / NRR / DRIP / RLSB

W. C. Liu

NRC / NRR / DRIP / RLSB

K. Riu

NRC / NRR / DRIP / RLSB

Jim DAVIS

NRC / NRR / EMEB

Chuck HSY

NRC / RES / MEB

TAMMY BLOOMER

NRC / NMSS / DWH

Brian Thomas

NRR / DSSA / SPLB

Raj Anand

NRR / ~~DSSA~~ / RLSB

JF Castello

~~RES~~ / DET

Goutam Bagchi

NRR / DE

HANS ASHAR Ashar

NRR / DE / EMEB

ROB ELLIOTT

ACRS

BARRY ELIOT

HERMAN GRAVES

SYED SHAUKAT

John Hannan

Chris Grimes

KEITH WICHMAN

Bill Bateman

WM BURTON

Allen Hiser

PAT PATNAIK

Jai Rajan

K. Raczowski

J. Dorier

M. Koo

T. Y. Chang

Wallace Harris

D. E. Lippman

Charles R. Jere

Andreas Klein

H. F. Conrads

~~M. J. Metz~~

NRC/NRR/EMCB

NRC/RES/ERAB

NRC/RES/ERAB

NRC/ORIP/RLSB

NRC/DE/EMCB

//

NRR/ORIP/RLSB

NRC/DE/EMCB

NRR/DE/EMCB

NRR/DE/EMCB

NRR/DE/EMCB

NRR/DE/EMCB

NRR/DE/EMCB

NRC/RES/DET/ERAB

NRC/RES/DET/ERAB

NRC/RES/DE/EMCB

Southern Alaska

NRC/NRR/DE

NRC/MEZ/DE

NRC/RES/DET/MEZ

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
MEETING OF THE PLANT LICENSE RENEWAL SUBCOMMITTEE  
LICENSE RENEWAL GUIDANCE DOCUMENTS AND SELECTED BWRVIP REPORTS  
MARCH 27, 2001  
ROCKVILLE, MARYLAND

**- PROPOSED SCHEDULE -**

<u>TOPIC</u>	<u>PRESENTER</u>	<u>TIME</u>
I. Opening Remarks	M. Bonaca, ACRS	8:30-8:35 a.m.
II. Staff Opening Remarks	C. Grimes, NRR	8:35-8:40 a.m.
III. Introduction and Overview	S. Lee, NRR	8:40-8:50 a.m.
IV. Overview of Public Comments	S. Koenick, NRR	8:50-9:00 a.m.
V. Changes to Standard Review Plan (SRP): Scoping and Screening Methodology	S.K. Mitra	9:00-9:15 a.m.
VI. Changes to Generic Aging Lessons Learned (GALL) Report, Chapters II and III	P. Kang	9:15-9:45 a.m.
<b>- BREAK -</b>		9:45-10:00 a.m.
VII. Changes to GALL, Chapter IV	J. Dozier	10:00-10:30 a.m.
VIII. Changes to GALL, Chapters V, VII and VIII	E. Kleeh K. Rico	10:30-11:00 a.m.
IX. Changes to GALL, Chapter VI	S.K. Mitra	11:00-11:15 a.m.
X. One-time Inspections, Regulatory Guide, NEI 95-10	D. Solorio	11:15-11:30 a.m.
XI. Changes to NEI 95-10: Industry Guidance	D. Walters, NEI	11:30-12:00 noon
<b>- LUNCH -</b>		12:00-1:00 p.m.
XII. Staff Introduction Concerning BWRVIP Topical Reports Related to License Renewal	R. Dyle, BWRVIP	1:00-1:30 p.m.
XIII. BWRVIP 76: Core Shroud Inspection	G. Carpenter, NRR	1:30-2:30 p.m.
<b>- BREAK -</b>		2:30-2:45 p.m.
XIV. BWRVIP 41: Jet Pump Assembly Inspection	G. Carpenter, NRR	2:45-3:15 p.m.

XV. BWRVIP 26: Top Guide Inspection	G. Carpenter, NRR	3:15-3:45 p.m.
XVI. BWRVIP 75: Technical Basis for Revisions to Generic Letter 88-01 Inspection Schedules	G. Carpenter, NRR	3:45-4:30 p.m.
XVII. Discussion	M. Bonaca, ACRS	4:30-5:00 p.m.
XVIII. Recess	M. Bonaca, ACRS	5:00 p.m.

**NOTE:** Presentation time should not exceed 50 percent of the total time allotted for specific item. The remaining 50 percent of the time is reserved for discussion.

Number of copies of the presentation materials to be provided to the ACRS - 25.



**ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
PLANT LICENSE RENEWAL SUBCOMMITTEE  
March 27, 2001**

**IMPROVED LICENSE RENEWAL GUIDANCE  
DOCUMENTS**

## **IMPROVED LICENSE RENEWAL GUIDANCE DOCUMENTS**

- **Generic Aging Lessons Learned (GALL) report (NUREG-1801)**
- **Standard Review Plan for License Renewal (NUREG-1800)**
- **Regulatory Guide for License Renewal (RG 1.188)**
- **Nuclear Energy Institute (NEI) industry guidance 95-10, Rev. 3**

## **TEAM EFFORT**

- **Office of Nuclear Reactor Regulation**
- **Office of Nuclear Regulatory Research**
- **Argonne National Laboratory**
- **Brookhaven National Laboratory**

## **AGENDA**

<b><u>Topic</u></b>	<b><u>Presenter</u></b>
<b>Introduction</b>	<b>Sam Lee, NRR</b>
<b>Public Comments</b>	<b>Steve Koenick, NRR</b>
<b>Standard Review Plan (Scoping)</b>	<b>S. K. Mitra, NRR</b>
<b>GALL, Chapters II and III (Structures)</b>	<b>Peter Kang, NRR</b>
<b>GALL, Chapter IV (Reactor Coolant System)</b>	<b>Jerry Dozier, NRR</b>
<b>GALL, Chapters V, VII, VIII (Engineered Safety Features, Auxiliary, Steam and Power)</b>	<b>Ed Kleeh, NRR Kimberley Rico, NRR</b>
<b>GALL, Chapter VI (Electrical)</b>	<b>S. K. Mitra, NRR</b>
<b>One-Time Inspections, Reg. Guide, NEI 95-10</b>	<b>Dave Solorio, NRR</b>

## **FUTURE ACTIVITIES**

- **Submit documents to Commission for approval (April 30, 2001)**
- **Continue dialog with NEI on 5 items (small-bore piping, bolting, loose parts monitoring, IPE/IPEEE scoping, fire protection)**
- **Participate in NEI demonstration project to implement improved guidance documents**

## **PUBLIC COMMENTS**

- **9/25/00 public workshop**
  - **115 participants**
- **128 written commenters**
  - **101 individuals**
  - **15 public interest groups**
  - **12 industry groups/utilities**
- **NUREG-1739, "Analysis of Public Comments on the Improved License Renewal Guidance Documents"**

## **STANDARD REVIEW PLAN (CHAPTER 2: SCOPING)**

### **Changes Resulting from Public Comments**

- **Incorporated severe accident management to source documents to consider for scoping**
- **Clarified the focus of the scoping review**

### **NEI Continued Dialog Item**

- **IPE/IPEEE as source document to consider for scoping**

## **GALL, CHAPTERS II AND III (STRUCTURES)**

### **Changes Resulting from Public Comments**

- **Specific criteria were developed to address aging management of inaccessible areas for concrete and steel**
- **Use IWE with Appendix J and coatings program (if credited) for managing loss of material due to corrosion of containment steel elements**
- **Use a combination of water chemistry program and monitoring of the pool water level to manage SCC and crevice corrosion of stainless steel spent fuel pool liner**
- **Cracking of component supports (metal members) due to vibratory loads and cyclic loading was determined not to be a license renewal issue**

## **GALL, CHAPTER IV (REACTOR COOLANT SYSTEM)**

### **Changes Resulting from Public Comments**

- **Added PWR reactor vessel internals program description to resolve the neutron fluence threshold issue for reactor vessel internals**
- **Boric Acid Corrosion programs (GL 88-05) are fully credited to manage the effects of boric acid corrosion**
- **PWSCC of pressurizer Inconel 600 penetrations is adequately managed by the chemistry and ISI programs; the Inconel 182 welds are a plant specific evaluation**
- **Removed insignificant aging effects such as wear/loss of material for the core support pads and the guide tube cards**
- **Added components such as the incore neutron flux monitoring tubes and flange bolting**

## **NEI Continued Dialog Items**

- **Operating experience with cracking of small-bore piping**
- **Management of loss of preload of reactor vessel internals bolting using the loose parts monitoring system**

## **GALL, CHAPTERS V, VII, VIII (ENGINEERED SAFETY FEATURES, AUXILIARY SYSTEMS, STEAM AND POWER CONVERSION SYSTEM)**

### **Changes Resulting from Public Comments**

- **Water chemistry program manages stress corrosion cracking in containment spray and safety injection systems**
- **General corrosion causes loss of material for carbon steel components in air but not for stainless steel components exposed to water systems**
- **Filters are considered short-lived components**
- **Management of external surfaces of carbon steel components is plant specific**
- **Biofouling could cause corrosion in untreated water systems**
- **Alternative to manage corrosion of buried piping**

- **Program to manage selective leaching of metal components in water systems**

### **NEI Continued Dialog Items**

- **Operating experience with cracking in bolting**
- **Inspections of fire protection systems**

## **GALL, CHAPTER VI (ELECTRICAL)**

### **Changes Resulting from Public Comments**

- **Consolidated boric acid corrosion programs**
- **Incorporated examples of specific insulation tests for medium voltage cables**
- **First inspection/test of the cables to be completed prior to the period of extended operation**

## **CHANGES TO RG 1.188 (FORMALLY DG-1104)**

- **Endorses NEI 95-10, Revision 3**
- **To address two public comments additional clarification was added to**
  - **Promulgate recent guidance regarding electronic submittals**
  - **Ensure information was not lost for graphical presentations**

## **CHANGES TO NEI 95-10 REVISION 3 (MARCH 1, 2001)**

- **Consistency changes**
- **Additional guidance for addressing GSIs/USIs**
- **Conforming changes resulting from changes to accident source term**

## ONE-TIME INSPECTIONS

<b>System</b>	<b>Calvert</b>	<b>Oconee</b>	<b>GALL</b>
Reactor Vessel, Internals, and Reactor Coolant System	RCS-SBP, RVI, PZR	RCS-SBP, OTSG, PZR	RCS-SBP, RVI, PZR
Engineered Safety Features	CIG, SI, CS	LPI, RBS	ECCS
Auxiliary Systems	CC, SRW, SW, FP, CVCS, CA, EDG, RM, NSSS-Sampling, CR & DGB HVAC, PC-HVAC, Instru Lines, AB-HVAC	CC, SRW, LPSW/HPSW, CAS, DJW, CW, CCW, RCPMOC, DW, LWD, <u>PS Systems</u> : CD, DA, GA, SSFASW, SSFDW, SSFSL	CCCS, OCCS, FP, EDG, SFS, SFCC, SDC, DFO
Steam and Power Conversion	FW, MS, ES, N&H, AFW	TGCW, TSP, Cond <u>PS Systems</u> : ASW	FW, STS, ES, Cond, SGB, AFW

**AFW - Auxiliary Feedwater**  
AB-HVAC - Auxiliary Building  
Heating and Ventilation  
ASW - Auxiliary Service Water  
**CA - Compressed Air**  
CAS - Chemical Addition  
CC - Component Cooling  
CCW - Condenser Circulating  
Water  
CD - Carbon Dioxide system  
CIG - Containment Isolation  
Group  
Cond -  
Condenser/Condensate  
system  
CR & DGB HVAC - Control  
Room and  
Diesel Generator Building  
HVAC  
CVCS - Chemical and Volume  
Control System  
CW - Chilled Water  
**DA - Depressing Air system**  
DFO - Diesel Fuel Oil  
DJW - Diesel Jacket Water  
DW - Demineralized Water

**ECCS - Emergency Core  
Cooling System**  
EDG - Emergency Diesel  
Generator  
ES - Extraction Steam  
**FWS - Feedwater system**  
**GA - Governor Air system**  
**HPSW - High Pressure  
Service Water**  
**Instru Lines - Instrument  
Lines**  
**LPI - Low Pressure Injection**  
LPSW - Low Pressure Service  
Water  
LWD - Liquid Waste Disposal  
**N&H - Nitrogen and  
Hydrogen system**  
**OTSG - Once Through  
Steam Generator lateral  
supports**  
**PC-HVAC - Primary  
Containment HVAC**  
**RBS - Reactor Building  
Spray**  
RCPOC - Reactor Coolant  
Pump Oil Collection

RCS - Reactor Coolant  
System - small bore piping  
RM - Radiation Monitoring  
RVI - Reactor Vessel Internals  
**SDC - Shutdown Cooling  
System (Older BWR)**  
SFCC - Spent Fuel Cooling  
and Cleanup  
SFS - Spent Fuel Storage  
SFPC - Spent Fuel Pool  
Cooling  
SGB - Steam Generator  
Blowdown  
SRW - Service Water  
SSFDW - SSF drinking water  
system  
SSFDW - SSF Drinking Water  
SSFSL - SSF Sanitary Lift  
SSFASW - Standby Shutdown  
Facility Auxiliary Service  
Water  
STS - Steam Turbine System  
SW - Salt Water  
**TGCW - Turbine Generator  
Cooling Water**  
TSP - Turbine Sump Pump

# **BWRVIP Reports Applicability to License Renewal**

---

ACRS Briefing  
March 27, 2001

C. E. Carpenter, Jr.  
Materials & Chemical Engineering Branch  
Office of Nuclear Reactor Regulation

## **BWRVIP and License Renewal**

---

### Agenda

- Overview of BWRVIP Program
- Staff's Review of BWRVIP Reports
  - Current Operating Period
  - BWRVIP Generic Aging Management Plans
  - Reports Supporting BWRVIP Generic AMP
- Specific Examples
- Conclusions

# **Overview of BWRVIP Program**

---

## **Staff's Perspective**

- BWRVIP is a Voluntary Industry Initiative
  - ▶ Program Began in 1994 to Address GL 94-03 Core Shroud Cracking Issues
  - ▶ Program Now Addresses All BWR Internal Components, Reactor Vessel, and Class I Piping
  - ▶ Program Covers Current Operating Term and Extended Operating Period
- BWRVIP Proactively Addressing Aging Degradation Issues That are Beyond Regulatory Requirements

# **Overview of BWRVIP Program**

---

## **Staff's Perspective (con't.)**

- Staff is Reviewing BWRVIP Submittals
  - ▶ 15 Inspection & Flaw Evaluation Guidelines
  - ▶ 13 Repair / Replacement Design Criteria
  - ▶ 4 Crack Growth Mitigation Guidelines
  - ▶ 22 Other Supporting Reports
  - ▶ 12 License Renewal Appendices
- Staff Expects to Finish Reviews by 12/2001
  - ▶ This is Dependent on Timeliness and Technical Adequacy of BWRVIP Responses to Staff RAIs and SE Open Items

# **Overview of BWRVIP Program**

---

## **Industry's Perspective**

- Presentation by Robin Dyle
  - Technical Chair, Assessment Committee

# **Staff's Review of BWRVIP Reports**

---

## **Current Operating Period**

- Staff Has Completed Review of Almost All BWRVIP Reports
  - Staff Has Concluded that Implementation of BWRVIP Guidelines, as Modified to Address Staff Comments, Will Provide an Acceptable Level of Quality for Inspection and Flaw Evaluation of Subject Safety-Related Components
  - Independent RES Review (NUREG/CR-6677) Found That Comprehensive Inspection Programs Like BWRVIP Significantly Reduces Core Damage Frequency

# **Staff's Review of BWRVIP Reports**

## **BWRVIP Generic Aging Management Plans**

- Staff Completing Review of BWRVIP LR Appendices and Has Found That:
  - ▶ Referencing BWRVIP AMPs and Completing Action Items Will Provide Reasonable Assurance that Applicant Will Adequately Manage Aging Effects During Extended Operation Period
  - ▶ Generic AMPs Usage Will Significantly Reduce Staff Review of LR Applications

# **Staff's Review of BWRVIP Reports**

## **BWRVIP Generic Inspection Guidelines & AMPs**

- BWRVIP Inspection and Flaw Evaluation (I&E) Guidelines
  - ▶ BWRVIP-18, Core Spray Internals I&E Guideline
  - ▶ BWRVIP-25, Core Plate I&E Guideline
  - ▶ BWRVIP-26, Top Guide I&E Guideline
  - ▶ BWRVIP-27, Standby Liquid Control System / Core Plate  $\Delta P$  I&E Guideline
  - ▶ BWRVIP-38, Shroud Support I&E Guidelines

# **Staff's Review of BWRVIP Reports**

---

## **BWRVIP Generic Inspection Guidelines & AMPs**

- **BWRVIP I&E Guidelines (con't)**
  - ▶ **BWRVIP-41, BWR Jet Pump Assembly I&E Guidelines**
  - ▶ **BWRVIP-42, BWR LPCI Coupling I&E Guideline**
  - ▶ **BWRVIP-47, BWR Lower Plenum I&E Guideline**
  - ▶ **BWRVIP-48, Vessel ID Attachment Weld I&E Guideline**
  - ▶ **BWRVIP-49, Instrument Penetration I&E Guidelines**

# **Staff's Review of BWRVIP Reports**

---

## **BWRVIP Generic Inspection Guidelines & AMPs**

- **BWRVIP I&E Guidelines (con't)**
  - ▶ **BWRVIP-74, BWR Reactor Pressure Vessel I&E Guideline**
    - Subsumes BWRVIP-05, BWR RPV Shell Weld Inspection Recommendations
  - ▶ **BWRVIP-76, BWR Core Shroud I&E Guidelines**
    - Subsumes BWRVIP-07, Guidelines for Reinspection of BWR Core Shrouds, and BWRVIP-63, Shroud Vertical Weld Inspection and Evaluation Guidelines, and supported by BWRVIP-80, Evaluation of Crack Growth in BWR Shroud Vertical Welds

# **Staff's Review of BWRVIP Reports**

## **Reports Supporting BWRVIP Generic AMP**

- **Additional BWRVIP Reports**
  - ▶ **BWRVIP-75, Technical Basis for Revisions to Generic Letter 88-01 Inspection Schedules (NUREG-0313)**
    - supported by BWRVIP-61, BWR Vessel and Internals Induction Heating Stress Improvement Effectiveness on Crack Growth in Operating Plants
  - ▶ **BWRVIP-78, BWR Integrated Surveillance Program**
    - Supported by BWRVIP-86, BWR ISP Implementation Plan

# **Staff's Review of BWRVIP Reports**

## **Reports Always Applicable**

- **Repair / Replacement Design Criteria**
  - Supported by BWRVIP-90, Interim Welding Guidelines for BWR Internals
  - ▶ **BWRVIP-16, Internal Core Spray Piping and Sparger Replacement Design Criteria**
  - ▶ **BWRVIP-19, Internal Core Spray Piping and Sparger RDC**
  - ▶ **BWRVIP-34, Technical Basis for Circumferential Weld Overlay Repair of Vessel Internal Core Spray Piping**

## **Staff's Review of BWRVIP Reports**

---

Reports Always Applicable (con't.)

- Repair / Replacement Design Criteria
  - ▶ BWRVIP-44, Underwater Weld Repair of Nickel Alloy Reactor Vessel Internals
  - ▶ BWRVIP-45, Weldability of Irradiated LWR Structural Components
  - ▶ BWRVIP-50, Top Guide / Core Plate RDC
  - ▶ BWRVIP-51, Jet Pump RDC
  - ▶ BWRVIP-52, Shroud Support and Vessel Bracket RDC

## **Staff's Review of BWRVIP Reports**

---

Reports Always Applicable (con't.)

- Repair / Replacement Design Criteria
  - ▶ BWRVIP-53, Standby Liquid Control Line RDC
  - ▶ BWRVIP-55, Lower Plenum RDC
  - ▶ BWRVIP-56, LPCI Coupling RDC
  - ▶ BWRVIP-57, Instrument Penetrations RDC
  - ▶ BWRVIP-58, CRD Internal Access Weld RDC

# **Staff's Review of BWRVIP Reports**

---

Reports Always Applicable (con't.)

- **Mitigation Reports**
  - Supported by BWRVIP-29, BWR Water Chemistry Guidelines - 1996 Rev., and BWRVIP-79, BWR Water Chemistry Guidelines - 2000 Rev.
  - ▶ BWRVIP-14, Evaluation of Crack Growth in BWR Stainless Steel RPV Internals
    - supported by BWRVIP-66, Review of Test Data for Irradiated Stainless Steel Components
  - ▶ BWRVIP-59, Evaluation of Crack Growth in BWR Nickel-Base Austenitic Alloys in RPV Internals

# **Staff's Review of BWRVIP Reports**

---

Reports Always Applicable (con't.)

- **Mitigation Reports**
  - ▶ BWRVIP-60, Evaluation of Crack Growth in BWR Low Alloy Steel RPV Internals
  - ▶ BWRVIP-62, Technical Basis for Inspection Relief for BWR Internal Components with Hydrogen Injection
    - Supported by BWRVIP-66

# **Staff's Review of BWRVIP Reports**

---

## **Reports Always Applicable (con't.)**

- Other Supporting BWRVIP Reports
  - ▶ BWRVIP-03, RPV Internals Examination Guidelines
  - ▶ BWRVIP-06, Safety Assessment of BWR Reactor Internals
    - supported by BWRVIP-09, Quantitative Safety Assessment of BWR Reactor Internals

## **Specific Examples**

---

### **BWRVIP-76, BWR Core Shroud I&E Guidelines**

- Staff is Reviewing Proposed Guidance
  - ▶ Incorporates BWRVIP-07, Guidelines for Reinspection of BWR Core Shrouds, and BWRVIP-63, Shroud Vertical Weld Inspection and Evaluation Guidelines, and supported by BWRVIP-80, Evaluation of Crack Growth in BWR Shroud Vertical Welds

## **Specific Examples**

### **BWRVIP-76, BWR Core Shroud I&E Guidelines (con't.)**

- Guidelines Propose:
  - Weld Inspection Strategy in Un-Repaired Shrouds
  - Weld Inspection Strategy in Repaired Shrouds
  - Inspection & Evaluation Reporting Requirements
  - Demonstration of Compliance with LR Rule
- Guidelines Incorporate Previous Staff SE Comments on BWRVIP-07 & -63
  - Staff Working with BWRVIP to Resolve Interpretation Issues

## **Specific Examples**

### **BWRVIP-41, BWR Jet Pump Assembly I&E Guidelines**

- Staff is Completing Review
- Specific Findings
  - Scope of Program
    - Provides Component Description and Function; Describes Susceptibility Factors; Discusses Potential Failure Locations and Safety Consequences; Describes Service Background and Inspection History; Provides Proposed Inspection Guidelines; and Describes Loadings.

## **Specific Examples**

---

### **BWRVIP-41, Jet Pump Assembly I&E Guidelines (con't)**

- **Specific Findings**
  - **Scope of Program**
    - Results of RES Program Will Be Used to Evaluate Need for Additional Inspections of CASS Jet Pump Assemblies in Renewal Period and to Modify Inspection Scope and Frequency, as Needed.
  - **Preventive Actions**
    - Maintaining High Water Purity Reduces SCC Susceptibility and HWC / NMCA Reduces it Further.

## **Specific Examples**

---

### **BWRVIP-41, Jet Pump Assembly I&E Guidelines (con't)**

- **Specific Findings**
  - **Parameters Monitored or Inspected**
    - Inspections and Flaw Evaluations Performed in Accordance with Staff-Approved BWRVIP Guidelines. Examination Expansion and Re-inspection Beyond Baseline Inspection Required If Flaws Are Detected.
  - **Detection of Aging Effects**
    - Inspections Performed in Accordance with Staff-Approved BWRVIP Guidelines Will Ensure That Aging-Related Degradation Detected Before Any Loss of Intended Function Occurs.

## **Specific Examples**

### **BWRVIP-41, Jet Pump Assembly I&E Guidelines (con't)**

- **Specific Findings**
  - ▶ **Monitoring and Trending**
    - Inspection Schedules in Accordance with BWRVIP Guidelines Ensures Timely Detection of Cracks. Scope of Examination Expansion and Re-inspection Beyond Baseline Inspection Required If Flaws Are Found.
  - ▶ **Acceptance Criteria**
    - Degradation Is Evaluated in Accordance with Approved BWRVIP Guidelines.

## **Specific Examples**

### **BWRVIP-41, Jet Pump Assembly I&E Guidelines (con't)**

- **Specific Findings**
  - ▶ **Corrective Actions**
    - Corrective Action Proposed in BWRVIP RDC Has Been Reviewed and Approved with Several Open Items.
  - ▶ **Operating Experience**
    - Instances of Cracking Have Occurred in Jet Pump Assemblies (Bulletin 80-07) Hold down Beam (IN 93-101, and Jet Pump Riser Pipe Elbows (IN 97-02).

## **Specific Examples**

---

### **BWRVIP-26, Top Guide I&E Guideline**

- **Staff Has Completed Review**
- **Specific Findings**
  - ▶ **Scope of Program**
    - Provides Component Description and Function; Describes Susceptibility Factors; Discusses Potential Failure Locations and Safety Consequences; Describes Service Background and Inspection History; Provides Proposed Inspection Guidelines; and Describes Loadings.

## **Specific Examples**

---

### **BWRVIP-26, Top Guide I&E Guideline (con't)**

- **Specific Findings**
  - ▶ **AMP's 10 Elements Findings Similar to BWRVIP-41 Review**
    - Operating Experience: IN 95-17 Discusses Cracking in Top Guides of U.S. and Overseas BWRs and Related Experience in Other Components Reviewed in GL 94-03 and NUREG-1544.
    - Cracking Has Also Been Observed in the Top Guide of a Swedish BWR.

## **Specific Examples**

### **BWRVIP-75, Technical Basis for Revisions to GL 88-01 Inspection Schedules (NUREG-0313)**

- Applicable in Extended Operating Period,  
But No License Renewal SE
- BWRVIP-75 Report Proposes Revisions to  
Extent and Frequencies for Piping  
Inspection Contained in GL 88-01

## **Conclusions**

### **Applicability of BWRVIP to License Renewal**

- Staff Completing Review of BWRVIP LR  
Appendices and Has Found That:
  - ▶ Referencing BWRVIP AMPs and Completing  
Action Items Will Provide Reasonable Assurance  
that Applicant Will Adequately Manage Aging  
Effects During Extended Operation Period
  - ▶ Generic AMPs Usage Will Significantly Reduce  
Staff Review of LR Applications

# **BWRVIP Program ACRS Presentation March 27, 2001**

**Robin Dyle  
Southern Nuclear  
Assessment Committee Chairman**

# Purpose

---

- **Provide a historical review of the BWRVIP program and structure**
- **Identify the scope of the program and why components were selected**
- **Identify the attributes of the BWRVIP program that ought to be part of a plant's implementing program**
- **Overview of the BWRVIP guidelines**
- **Detailed review of BWRVIP Inspection and Flaw Evaluation Guidelines for the Shroud, Jet Pump, Top Guide and Piping**

# Historical Perspective

---

- **IGSCC in austenitic piping was a major issue for BWRs in the 1980s**
- **Potential susceptibility of reactor internals to IGSCC was recognized by EPRI and the BWROG in the 1980s**
- **Shroud cracking in 1993-1994 confirmed that IGSCC of internals is a significant issue for BWRs**
- **BWR utility executives formed the BWRVIP in mid-1994 to proactively address BWR reactor vessel and internals material condition issues**

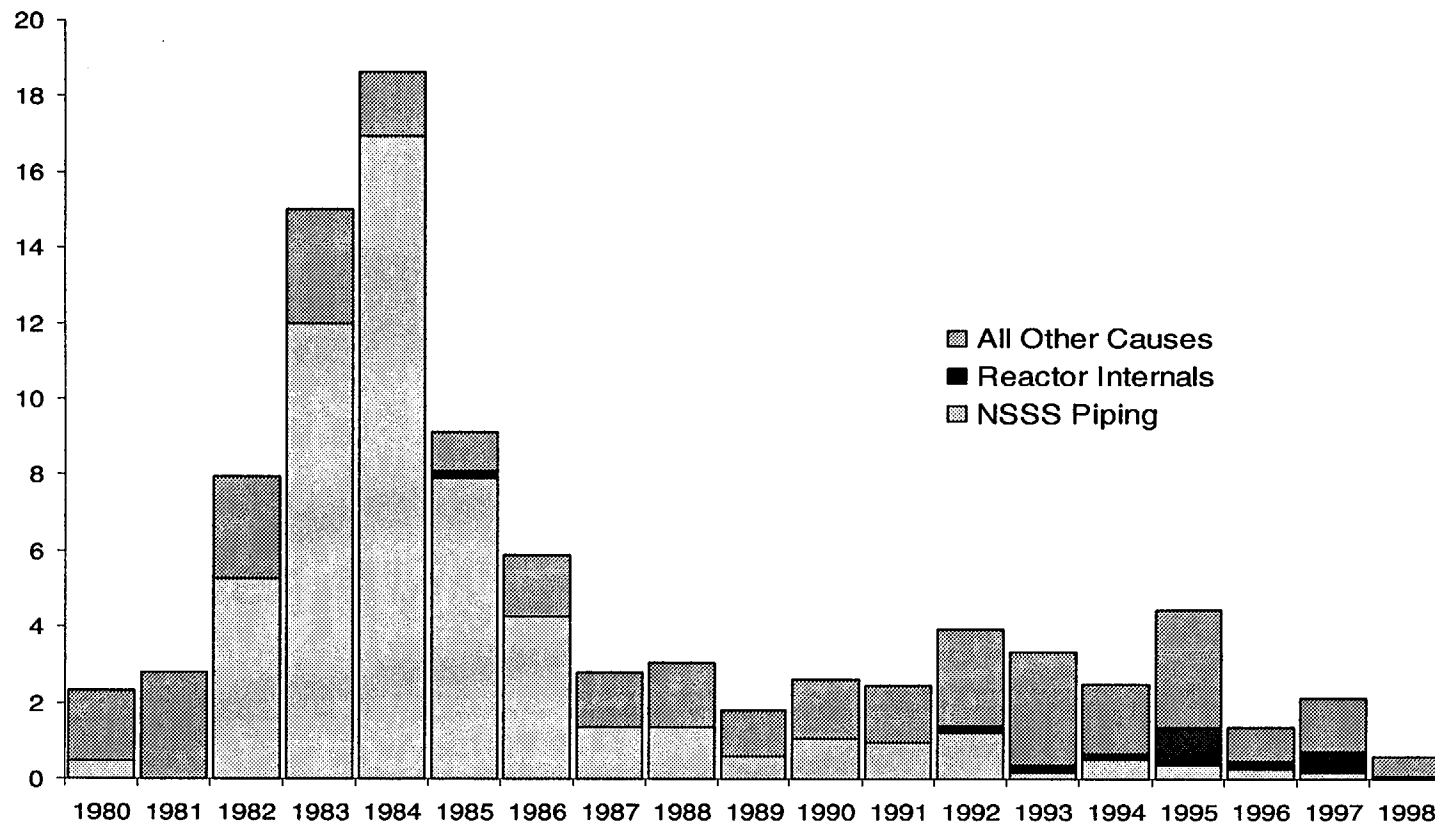
# **BWRVIP Objectives**

---

- **Lead industry toward proactive generic resolution of vessel and internals material condition issues**
- **Identify or develop generic, cost-effective strategies from which each operating plant will select the alternative most appropriate to their needs**
- **Serve as a focal point for the regulatory interface with the industry in BWR vessel and internals material condition issues (including license renewal)**
- **Share information among members to obtain useful data from many sources**

# Capacity Factor Losses in BWRs

Capacity Factor Loss (%) Through December 31, 1998



# BWRVIP Domestic Plants

---

- Browns Ferry
- Brunswick
- CGS (WNP-2)
- Clinton
- Cooper
- Dresden
- Duane Arnold
- Fermi
- FitzPatrick
- Grand Gulf
- Hatch
- Hope Creek
- LaSalle
- Limerick
- Monticello
- Nine Mile Point
- Oyster Creek
- Peach Bottom
- Perry
- Pilgrim
- Quad Cities
- River Bend
- Susquehanna
- Vermont Yankee

# **BWRVIP International Members**

---

- **Chubu Electric Power Company**
- **Chugoku Electric Power Company**
- **Comision Federal de Electricidad**
- **Forsmark Kraftgrupp AB**
- **Iberdrola Generation**
- **Japan Atomic Power Company**
- **OKG Aktiebolag**
- **Tohoku Electric Power Company**
- **Tokyo Electric Power Company**
- **Taiwan Power Company**

# Project Scope

---

- Vessel and internal components from nozzle inward (with some exceptions)
- BWRVIP safety assessment (BWRVIP-06)
  - ♦ Identified components to be addressed
  - ♦ Prioritized when components were to be addressed

Core shroud

Shroud support

Core spray internals

Jet pump assembly

Top guide

Core plate

Lower plenum components

Vessel ID brackets

Standby liquid control

LPCI couplings

Instrument penetrations

RPV

## BWRVIP guidelines

---

- **I&E guidelines**
  - ♦ What/when to inspect
  - ♦ Flaw evaluations
- **NDE guidelines**
  - ♦ How to implement inspection methods
- **Repair guidelines**
  - ♦ How to repair if necessary
- **Mitigation guidelines**
  - ♦ Criteria for effective HWC, NMCA, etc.

hydrogen  
water

noble  
metal?

# BWRVIP Organization

## BWR Vessel and Internals Project Organization and Technical Committee Membership

**BWRVIP Chairman**  
Carl Terry, Niagara Mohawk

**BWRVIP Vice Chairman**  
Joe Hagan, Exelon

<b>Task 1 Integration</b>	<b>Task 2 Inspection</b>	<b>Task 3 Assessment</b>	<b>Task 4 Mitigation</b>	<b>Task 5 Repair</b>
<b>Executive Chairman</b> Open	<b>Executive Chairman</b> Bill Eaton, Entergy Ops.	<b>Executive Chairman</b> George Vanderheyden, Exelon	<b>Executive Chairman</b> Lewis Sumner, SNOG	<b>Executive Chairman</b> George Jones, PPL
<b>Technical Chairman</b> Vaughn Wagoner, CP&I. 919.546.7959	<b>Technical Chairman</b> Carl Larsen, VY 802.258.5915	<b>Technical Chairman</b> Rich Ciemiewicz, Exelon 717.456.4026	<b>Technical Chairman</b> John Wilson, AmerGen 217.935.4354	<b>Technical Chairman</b> Bruce McLeod, SNOG 205.992.7446
Steve Brown, Entergy Ops. Ron Chickering, AmerGen Rich Ciemiewicz, Exelon Doug Coleman, Entergy NW Stan Domikaitus, NPPD Les England, Entergy Ops. Greg Harttraft, AmerGen David Hughes, PSEG Nuclear Jim Kenny, PPL Carl Larsen, VY Bruce McLeod, SNOG Keith Moser, Exelon Bob Penny, Entergy Nuc. NE Dave Reyes, First Energy Aurelio Sala, Iberdrola Herb Webb, PPL John Wilson, AmerGen	Dave Anthony, AmerGen Mike Cross, Entergy Ops. Charles Garrow, Entergy Nuc. NE Rick Hambleton, DECo Tim McClure, NPPD Rick Nademus, AmerGen Tony Oliveri, PSEG Nuclear Gary Park, Alliant Bob Penny, Entergy Nuc. NE Doug Ramey, Entergy NW Aurelio Sala, Iberdrola Joe Schanen, NSP Dave Schmidt, Exelon Scott Sienkiewicz, PPL Ted Siever, NMPC Harry Smith, Exelon Joel Whitaker, TVA Kevin White, SNOG Blane Wilton, CP&I. Chuck Wirtz, First Energy	Jai Brihmadese, Entergy Ops. Steve Brown, Entergy Ops. Robin Dyle, SNOG Charles Garrow, Entergy Nuc. NE Dennis Girroir, VY Rick Hambleton, DECo Greg Harttraft, AmerGen Ed Hartwig, TVA Donna Haviland, First Energy George Inch, NMPC Keith Moser, Exelon Kenneth Neal, Entergy Nuc. NE Gary Park, Alliant David Potter, NSP Doug Ramey, Entergy NW Aurelio Sala, Iberdrola Randy Schmidt, PSEG Nuclear David Sun, Exelon Lew Willertz, PPL Blane Wilton, CP&I.	Joan Bozeman, CP&I. Bill Burke, Entergy Ops. Bruce Cummings, DECo Shashi Dhar, NMPC Jeff Goldstein, Entergy Nuc. NE John Grimm, First Energy Greg Harttraft, AmerGen Kevin Jepson, NSP Wendell Keith, Alliant Larry Lockard, NPPD Larry Loomis, Entergy Nuc. NE Dan Malauskas, Exelon Ralph Maurer, AmerGen Mark Meltzer, PSEG Nuclear Mike Metell, VY David Morgan, PPL Larry Morrison, Entergy NW Drew Odell, Exelon Robert Phillips, TVA Dennis Rickertsen, SNOG Aurelio Sala, Iberdrola	Enrico Betti, VY Kim Bezzant, NSP Roy Corieri, NMPC John Disney, Entergy NW Bob Geier, Exelon Gay Haliburton, TVA Greg Harttraft, AmerGen Tim McClure, NPPD Jim O'Sullivan, PPL Priit Okas, Entergy Nuc. NE Gary Park, Alliant Robert Phillips, TVA Rick Rogoski, First Energy David Rydman, Entergy Nuc. NE Aurelio Sala, Iberdrola Randy Schmidt, PSEG Nuclear Eric Tschantre, Exelon
<b>EPRI Manager</b> Tom Mulford 650.855.2766	<b>EPRI Manager</b> Greg Selby 704.547.6095	<b>EPRI Manager</b> Bob Carter 704.547.6019	<b>EPRI Manager</b> Raj Pathania 650.855.2998	<b>EPRI Manager</b> Ken Wolfe 650.855.2578

Open  
BWRVIP Liaison to EPRI Nuclear Power Council

02/23/2001

# Assessment Committee Products

---

- **Inspection and flaw evaluation (I&E) guidelines**
- **Crack growth and fracture toughness reports**
- **Safety assessment for internal components (BWRVIP-06)**
- **Component configuration drawings (BWRVIP-15)**
- **Bounding assessment for RPV integrity (BWRVIP-08/-46)**
- **Effect of IHSI (BWRVIP-61)**
- **Revision to GL 88-01 (BWRVIP-75)**
- **Integrated surveillance program (BWRVIP-78)**

## **I&E Guidelines 1 of 2**

---

**BWRVIP-01 Core Shroud**

**BWRVIP-05 RPV Inspection**

**BWRVIP-07 Core Shroud Re-inspection**

**BWRVIP-18 Core Spray Internals**

**BWRVIP-25 Core Plate**

**BWRVIP-26 Top Guide**

**BWRVIP-27 SLC System/Core Plate  $\Delta P$**

**BWRVIP-38 Shroud Support**

**BWRVIP-41 Jet Pump Assemblies**

**BWRVIP-42 LPCI Couplings**

**BWRVIP-47 Lower Plenum Components (CRD, etc)**

## **I&E Guidelines 2 of 2**

---

**BWRVIP-48 Vessel ID Attachment Welds (Brackets)**

**BWRVIP-49 Instrument Penetrations**

**BWRVIP-63 Shroud Vertical Welds**

**BWRVIP-74 RPV**

**BWRVIP-76 Comprehensive Core Shroud  
(Combines BWRVIP-01, -07, and -63)**

## **Why exclude some components from inspection?**

---

- **Safety assessment (BWRVIP-06) performed in 1995 supplemented by simplified PRA (BWRVIP-09)**
- **Assessment identified components that are necessary for safe operation and shutdown**
  - ♦ **Maintain coolable geometry**
  - ♦ **Maintain rod insertion times**
  - ♦ **Maintain reactivity control**
  - ♦ **Assure core cooling**
  - ♦ **Assure instrumentation availability**
- **Some components (e.g., feedwater spargers) are not a safety issue**

## Contents of I&E Guidelines

---

- Description of component
- Discussion of susceptibility to IGSCC
- Discussion of consequences of failure of each location
- Inspection history
- Inspection requirements
- Evaluation methods
- Reporting requirements

(Note: Format differs somewhat among I&E Guidelines)

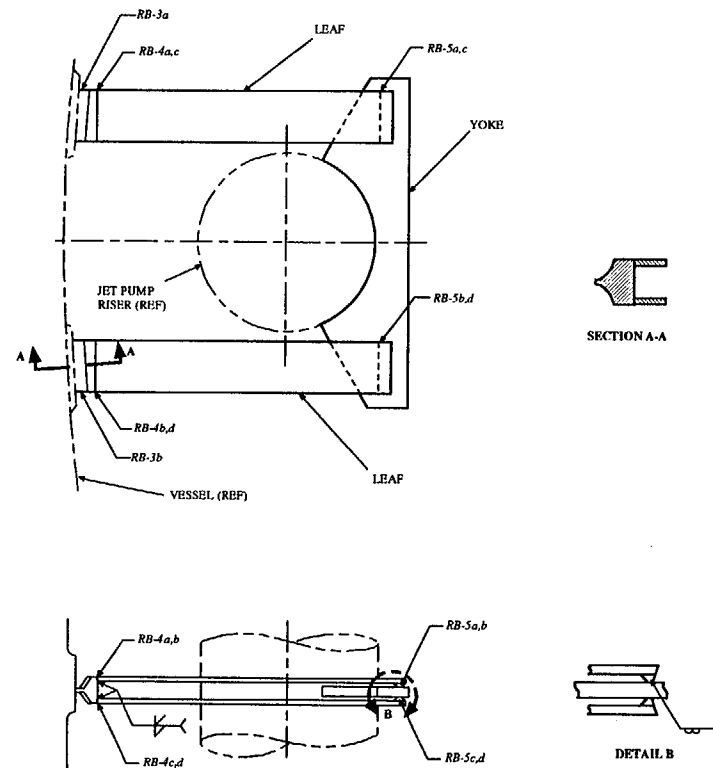
## **Description of components**

---

- **Sketches show location of welds, bolted joints, etc.**
- **Locations labeled (e.g., H-4, RS-1) for identification purposes**
- **General plant variations shown (BWR/2 vs. BWR/6)**
  - ♦ **In some cases, plant specific configurations shown**
- **Configuration based on best available design information (BWRVIP-15)**

**(Note: Owners responsible for verifying configuration to determine applicability of I&E Guidelines)**

# Sample configuration sketch



Note 1: Triple Leaf Brace will have additional welds at RB-4 and RB-5  
 Note 2: This is the Primary Riser Brace at Dresden 2

Figure 2.3.1-3: Typical Secondary Double-Leaf Riser Brace

## **Susceptibility discussion**

---

- **Describes which locations are likely to experience degradation through IGSCC or other mechanisms, and which are not**
- **Non-susceptible locations do not normally require inspection**
- **Input to inspection requirements**

## **Consequences of failure**

---

- **Discussion of consequences of failure for each location and ability to perform intended function**
- **Locations not having adverse safety consequences are not required to be inspected**
  - ♦ **Guidelines recommend that there may be economic reasons to inspect additional locations (review GE SILs)**
  - ♦ **Input to inspection requirements**

## **Inspection history**

---

- **Review of inspections performed to date and results**
- **List of indications observed**
- **Secondary input to inspection requirements**

## **Inspection requirements**

---

- **List of locations to inspect**
- **Schedule for “baseline” inspection and guidance for re-inspection**
- **Inspection methods (e.g., UT, EVT-1) for each location**
- **Scope expansion**
  - ♦ **Additional inspections if cracks are found**
- **Alternatives to inspection**
  - ♦ **Specific repairs or analyses to eliminate inspections**

## **Inspection methods**

---

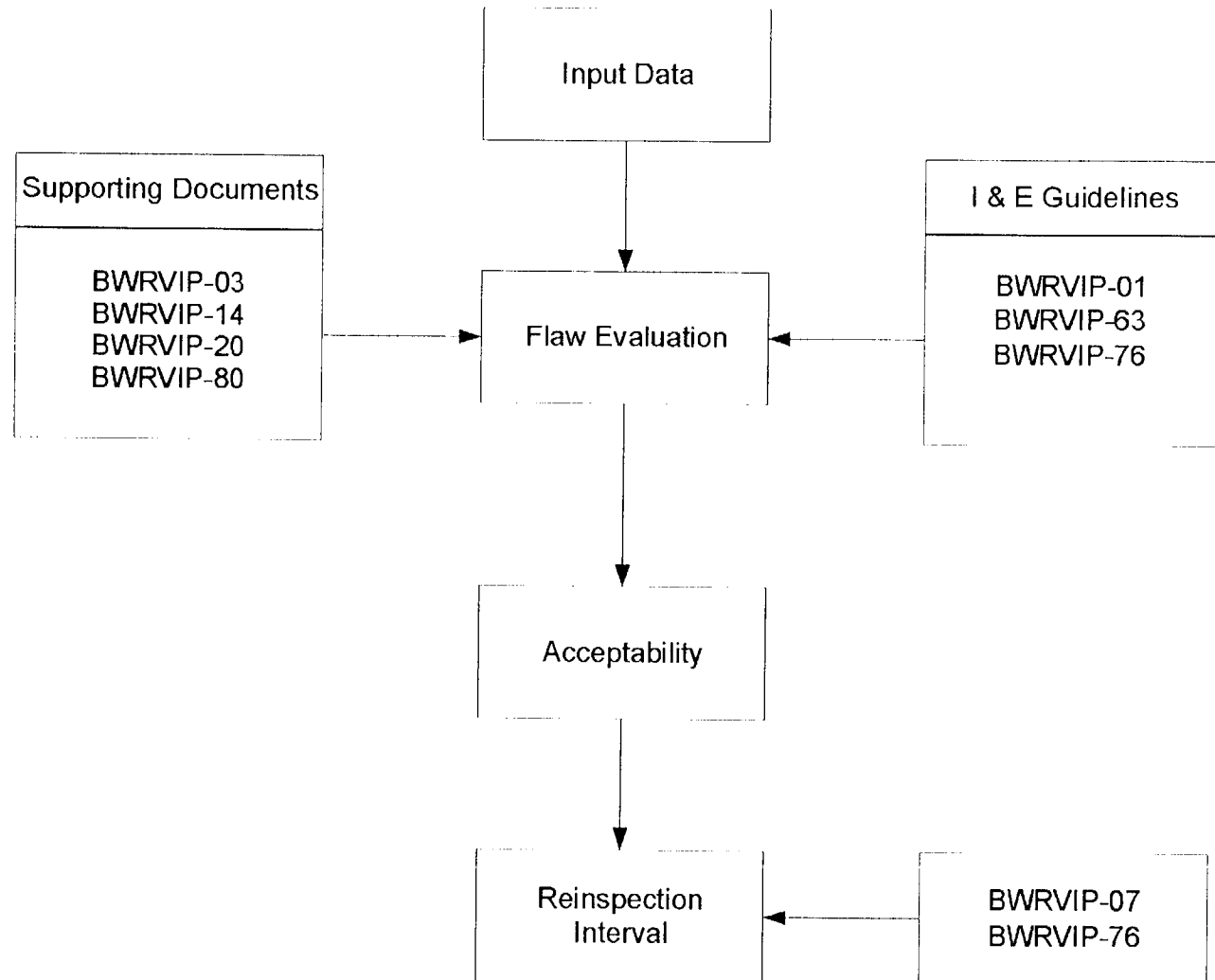
- **I&E Guidelines specify methods for each component**
  - ♦ **EVT-1: visual with 1/2-mil resolution**
  - ♦ **VT-1: visual with 1/32-in resolution**
  - ♦ **VT-3: general visual**
  - ♦ **UT: ultrasonic**
  - ♦ **ET: eddy current**
- **Earlier visual methods (CSV, MVT-1) eliminated**
- **Details of methods found in BWRVIP-03**

## **Flaw evaluation**

---

- **Describes acceptable procedures for evaluation of flaws found during inspections**
  - ♦ **Structural analysis techniques and, in some cases, equations**
  - ♦ **Assumptions regarding cracking in un-inspected regions**
  - ♦ **Consideration of NDE uncertainty (if applicable)**
  - ♦ **Leakage calculations (if applicable)**
  - ♦ **Limitations on use (e.g., high fluence components require special analytical techniques)**
- **Crack growth rates from BWRVIP-14 (SS), -59 (nickel base), -60 (LAS), -80 (SS)**

# Core shroud flaw evaluation flow chart



00077r0

## **Reporting of inspection data**

---

- **I&E Guidelines specify that a summary of inspection results be provided to the BWRVIP subsequent to each outage**
  - ♦ **EPRI compiles summaries and provides to the U.S. NRC semi-annually**
- **Inspection committee has developed spreadsheets for reporting inspection results**
- **Facilitates BWRVIP assessment of the program and will identify conditions that might warrant program revisions**

## **Related issues**

---

- **Inspection with HWC/NMCA**
- **BWRVIP-03: NDE Guidelines**
- **Repair issues**
- **Interface with ASME Code**
- **License Renewal**

## **Inspection with HWC/NMCA**

---

- **BWRVIP-62: Technical Basis for Inspection Relief for BWR Internal Components with Hydrogen Injection**
  - ♦ **Justifies reduced inspections for plants on hydrogen water chemistry**
  - ♦ **Currently under U.S. NRC review**
  - ♦ **The BWRVIP will propose component-specific reduced inspection intervals at a later date**

## **BWRVIP-03: NDE Guidelines**

---

- **Detailed description of inspection techniques for each component**
- **Description of vendor demonstrations performed on mock-ups**
- **Establishes NDE uncertainty for each demonstration**
  - ♦ **Inclusion of NDE uncertainty in flaw evaluations is currently being discussed with the U.S. NRC**
  - ♦ **NDE uncertainty not considered for determining reinspection intervals**
- **Updated annually (Rev. 3 current as of 3/01)**

## **What if I have to repair? 1 of 3**

---

- **If flaw evaluations produce unacceptable results, repair may be necessary**
- **Repairs should comply with BWRVIP repair design criteria**
  - ♦ **Structural requirements, material considerations, fabrication requirements, inspection requirements, etc.**
- **If significant component degradation is anticipated, procurement of “contingency” repair hardware may be warranted**
- **May consider justification of operation for a partial cycle to allow time for the design and procurement of a repair**

## **What if I have to repair? 2 of 3**

---

- **Repair of safety-related internals within the BWRVIP scope must be in compliance with a 10CFR50, Appendix B program**
  - ♦ Repairs may also be required to meet Section XI of the ASME Code, and be reported as required by Section XI (NIS-2 or OAR forms)
  - ♦ Repair of non-code, safety-related components are to be reported and documented per BWRVIP criteria

## **What if I have to repair? 3 of 3**

---

- **Inspection guidelines may be different than for un-repaired components**
  - ♦ **In general, post-repair inspection requirements should be developed by the repair designer**
  - ♦ **Some inspection requirements for repaired shrouds are contained in I&E Guidelines (BWRVIP-07 and BWRVIP-76)**

## **Interface with the ASME Code**

---

- **Section XI requires inspection, evaluation and repair of certain components that are also addressed by BWRVIP I&E Guidelines**
- **U.S. NRC approval of I&E Guidelines does not eliminate any requirements to meet ASME Code commitments**
- **Two sets of requirements exist (sometimes different)**
- **Each licensee must seek approval in order to use BWRVIP guidelines in lieu of the ASME Code via 10CFR50.55a**
  - ♦ **The BWRVIP is to develop a template for submittal of a technical alternative**

## **License renewal**

---

- **I&E Guidelines technical criteria typically developed without regard to a specific operating period**
- **Appendices to I&E Guidelines developed to allow utilities to use guidelines for “Demonstration of Compliance with License Renewal Rule”**
  - ♦ **Appendices define any additional inspections or analyses that must be completed to allow applicability of I&E Guidelines beyond 40 years**

# CONTENTS

---

- **Purpose**
- **Overview of the BWRVIP guidelines**
  - ◆ General content
  - ◆ Related issues
- ▶ • **Program issues**
- **Detailed review of BWRVIP Inspection and Flaw Evaluation Guidelines for each component**

# **BWRVIP Program Issues    1 of 2**

---

- **A BWRVIP program is that controlled process used by a licensee to implement the requirements described in the applicable BWRVIP I&E Guidelines, along with supporting BWRVIP documents**
- **Can be accomplished in a variety of fashions:**
  - ♦ **Special ISI procedures**
  - ♦ **Augmented ISI programs**
  - ♦ **Specifications**

# BWRVIP Program Issues 2 of 2

---

- **The program assures:**
  - ♦ **Inspections performed on time**
  - ♦ **Inspections employ the correct technique**
  - ♦ **Inspections are accomplished by qualified personnel and systems**
  - ♦ **Inspection results and flaws are evaluated properly with the correct methodology**
  - ♦ **Repairs meet the ASME Code or BWRVIP criteria, as applicable**
- **BWRVIP scope components are safety-related and therefore involve the use of a Quality Assurance program**

# CONTENTS

---

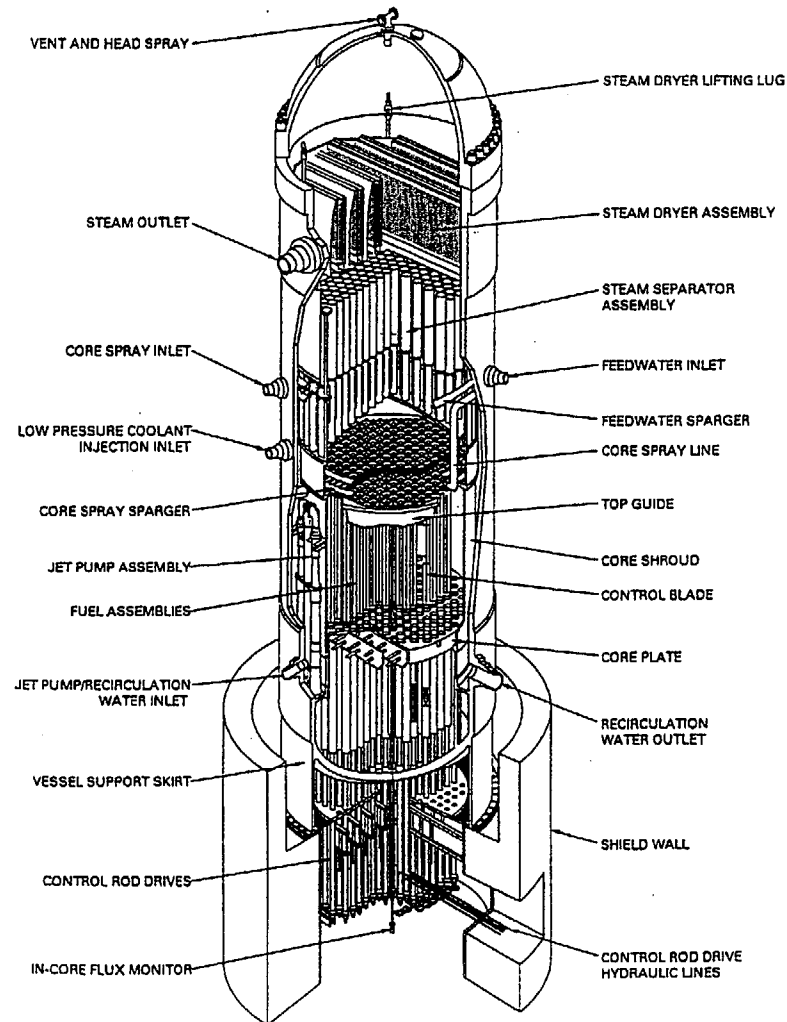
- **Purpose**
- **Overview of the BWRVIP guidelines**
  - ◆ **General content**
  - ◆ **Related issues**
- **Program Issues**
- ▶ • **Detailed review of BWRVIP Inspection and Flaw Evaluation Guidelines for Shroud, Jet Pump Assembly, Top Guide and Piping**

# Format for Detailed Review

---

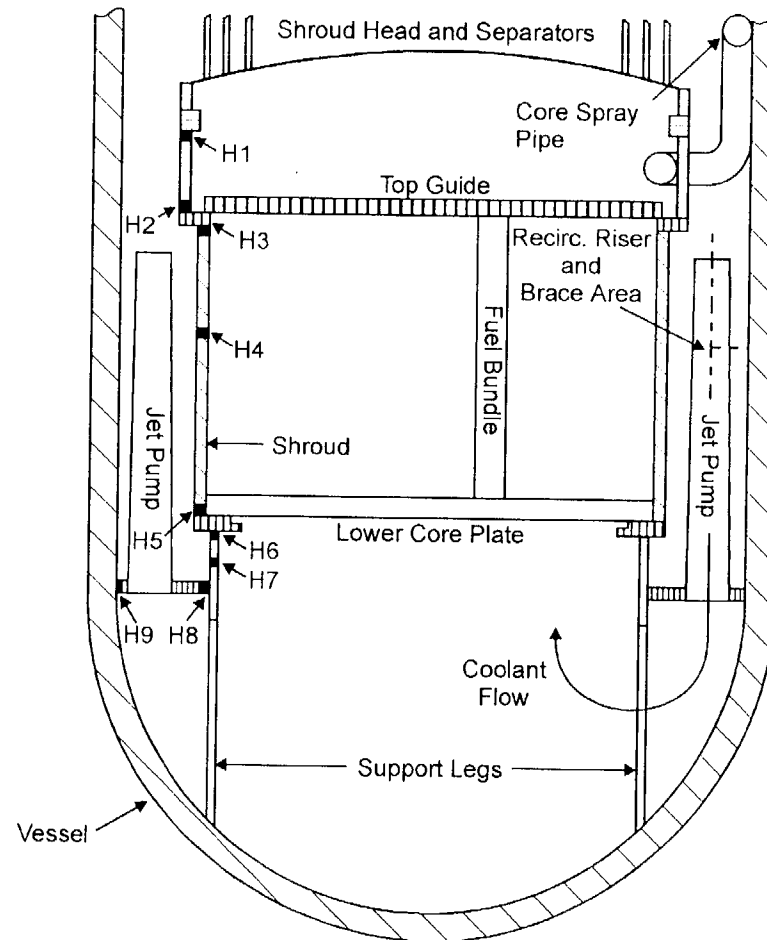
- Overview of component configuration sketches
- Inspection history
- Overview of inspection guidelines
  - ♦ Baseline
  - ♦ Options
  - ♦ Scope expansion
  - ♦ Re-inspection
- Overview of flaw evaluation
- Status of U.S. NRC review of guidelines (as of August 2000)

# Typical Non-BWR/2 Reactor Assembly



# Configuration

## Core Shroud



## **Inspection history**

---

### **Inspections:**

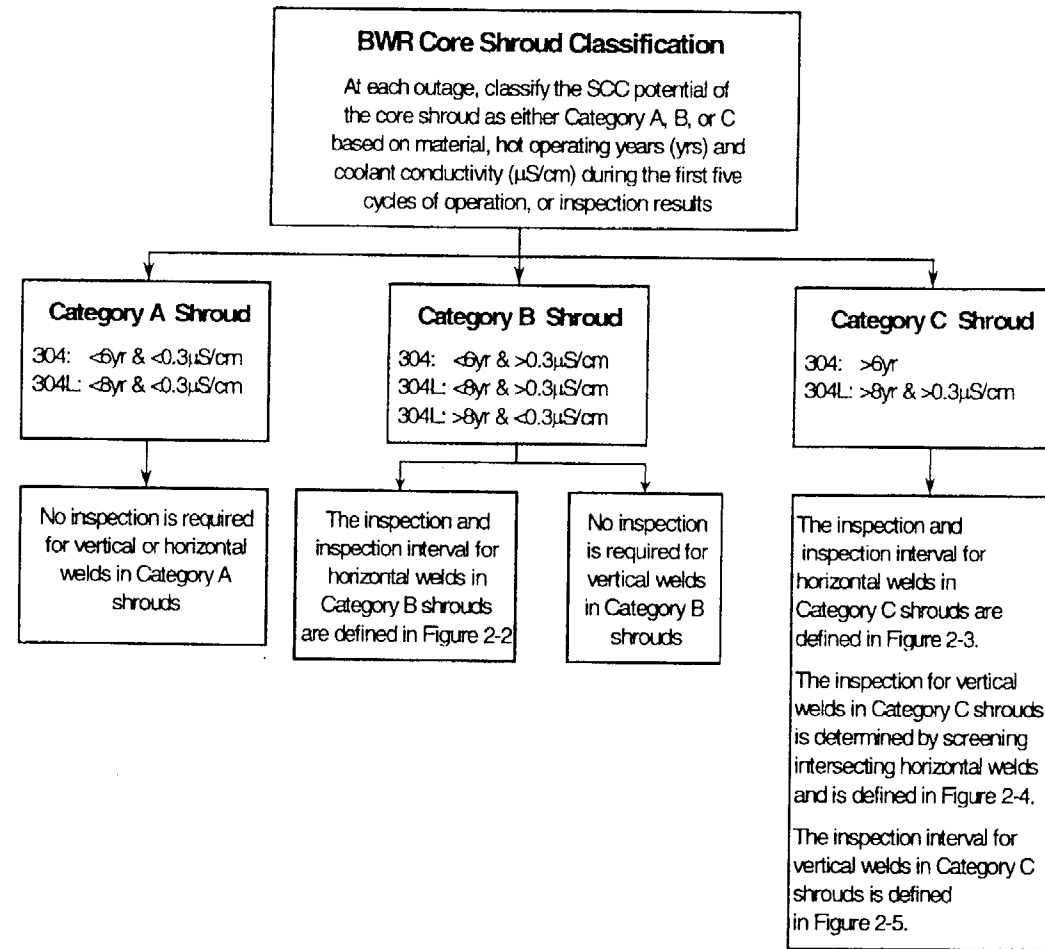
- **Most plants have completed inspection of horizontal welds and repair hardware per I&E Guidelines**
- **Limited inspection of ring segment welds and vertical welds per I&E Guidelines**

### **Findings:**

- **Significant cracking in horizontal welds**
- **Some cracking in vertical welds**
- **Some instances of degraded repair hardware**
- **One reported indication in ring segment weld**

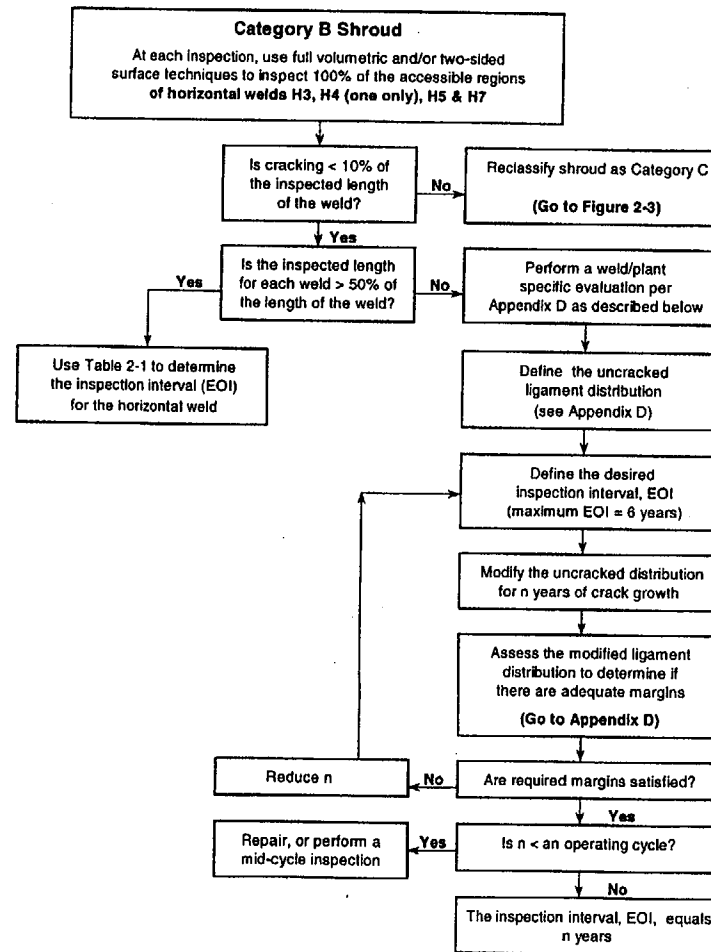
# Inspection guidelines 1 of 6

## Unrepaired Core Shroud Classifications



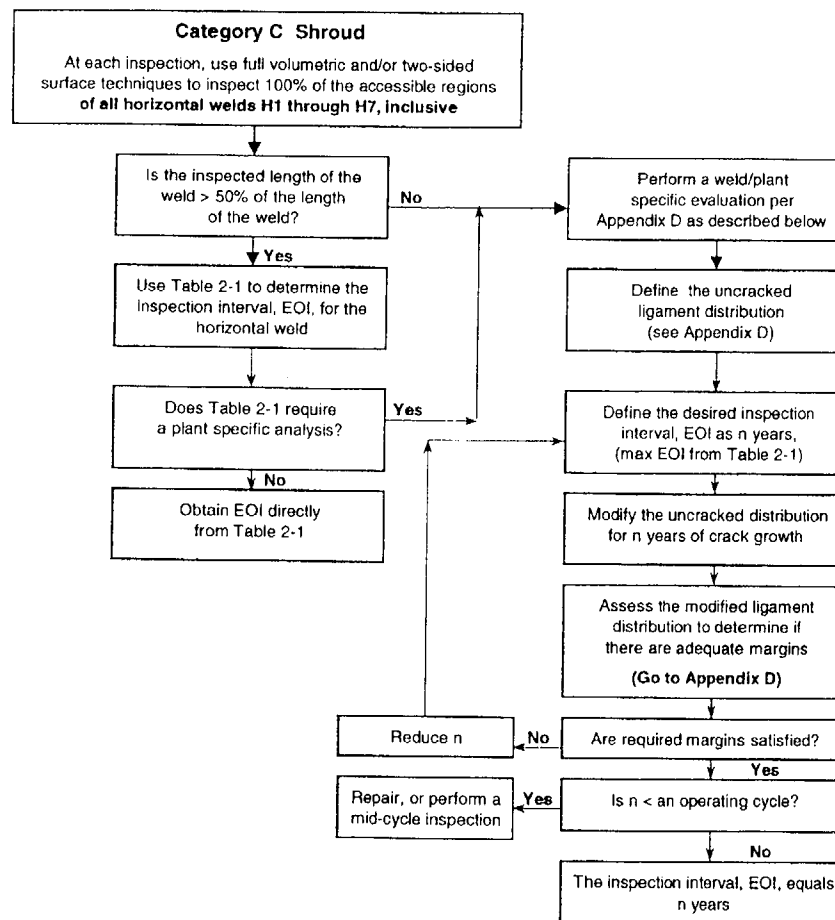
# Inspection guidelines 2 of 6

## Inspection Requirements for Category B Shroud Horizontal Welds



# Inspection guidelines 3 of 6

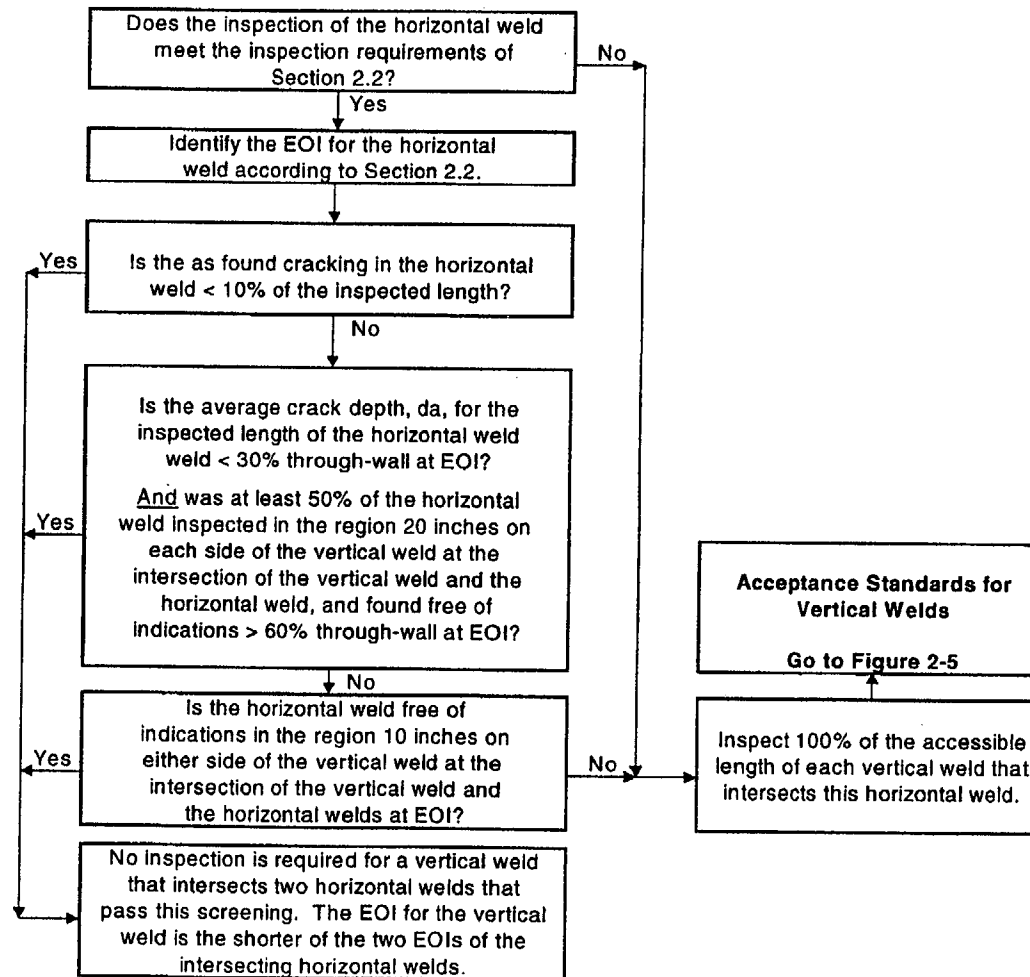
## Inspection Requirements for Category C Shroud Horizontal Welds



Note: If sufficient inspection cannot be performed to demonstrate Lmin a plant specific analysis (consistent with the approach described in Appendix D) should be performed and submitted to the NRC for review and approval.

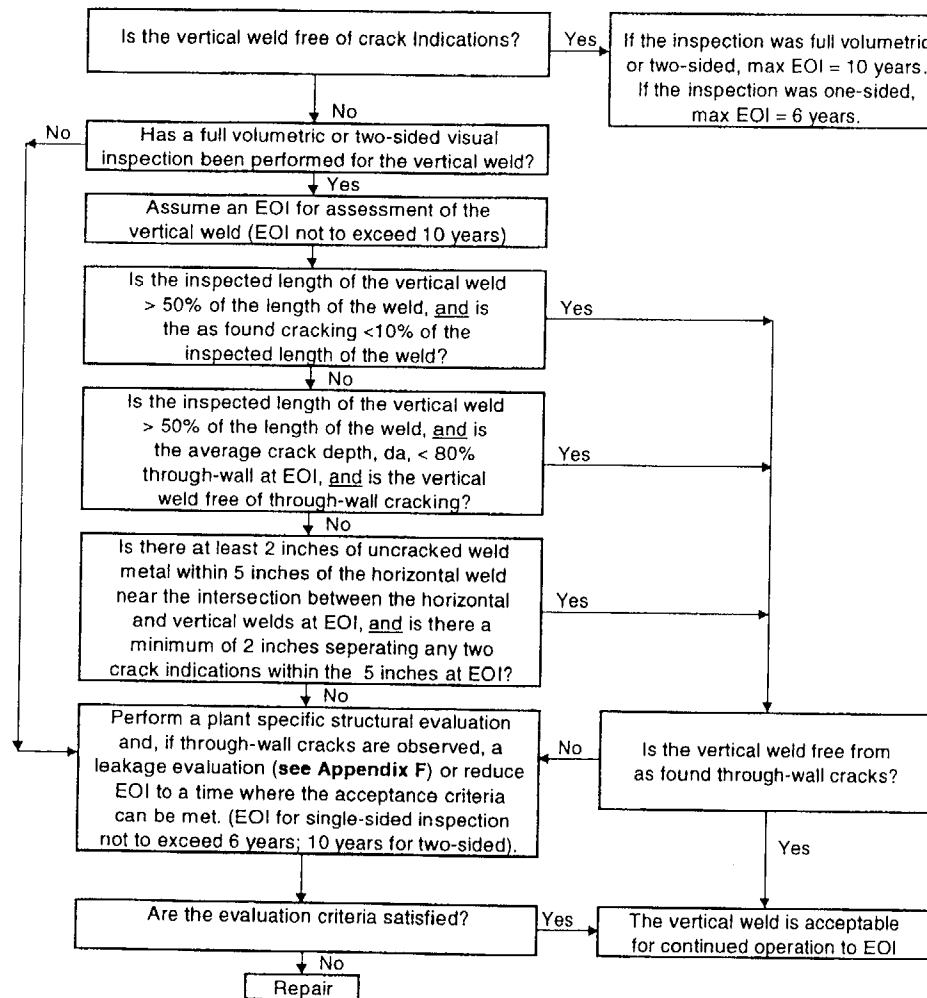
# Inspection guidelines 4 of 6

## Vertical Weld Inspection Scope Based Upon Screening of Horizontal Welds



# Inspection guidelines 5 of 6

## Inspection Requirements for Vertical Welds



# Inspection guidelines 6 of 6

## Reinspection Intervals for Horizontal Welds

Percent Cracking <sup>(1,2)</sup>	Stress <sup>(3)</sup> = 1 ksi		Stress <sup>(3)</sup> = 3 ksi		Stress <sup>(3)</sup> = 6 ksi	
	Limit Load	LEFM <sup>(4)</sup>	Limit Load	LEFM <sup>(4)</sup>	Limit Load	LEFM <sup>(4)</sup>
$x < 10$	10.0	10.0	10.0	10.0	10.0	10
$10 \leq x < 20$	10.0	10.0	10.0	10.0	10.0	6.0
$20 \leq x < 25$	6.0	6.0	6.0	6.0	6.0	6.0
$25 \leq x < 30$	6.0	6.0	6.0	6.0	6.0	Note 6
$x \geq 30$	Note 6					

### Notes:

1. Length of weld inspected must be at least 50 percent of the weld circumference with either volumetric or two sided surface technique.
2. Cracking is defined as the total length of as-found cracks as a percentage of the total length inspected for each weld. Crack lengths should be rounded up to the next whole number.
3. Stress values are for faulted loading conditions. Interpolation between stress values is acceptable.
4. Applies to welds with cracking  $\geq 10$  percent where neutron fluence is greater than  $3 \times 10^{20}$  n/cm<sup>2</sup> and less than  $5 \times 10^{20}$  n/cm<sup>2</sup> ( $E > 1\text{MeV}$ ). For fluences exceeding  $5 \times 10^{20}$  n/cm<sup>2</sup>, a plant specific analysis is required to be submitted to the NRC.
5. Linear extrapolation of the reinspection intervals is permitted up to a value of 10 ksi. Values should be capped (or rounded down) at values consistent with the approach in the above table.
6. Plant specific analysis is required.

## Flaw evaluation

---

- **I&E Guidelines provide generic guidance**
  - ♦ Other evaluation methods are acceptable
- **Evaluation approach based upon fluence at the end-of-evaluation period**
- **Limit load for ductile material behavior for all components**
- **LEFM/EPFM for less ductile material behavior**
- **BWRVIP developed Distributed Ligament Length (DLL) software utilized (BWRVIP-20)**
  - ♦ Can evaluate actual postulated crack profile

---

LEFM - Linear Elastic Fracture Mechanics

EPFM - Elastic-Plastic Fracture Mechanics

## **Status of U.S. NRC review**

---

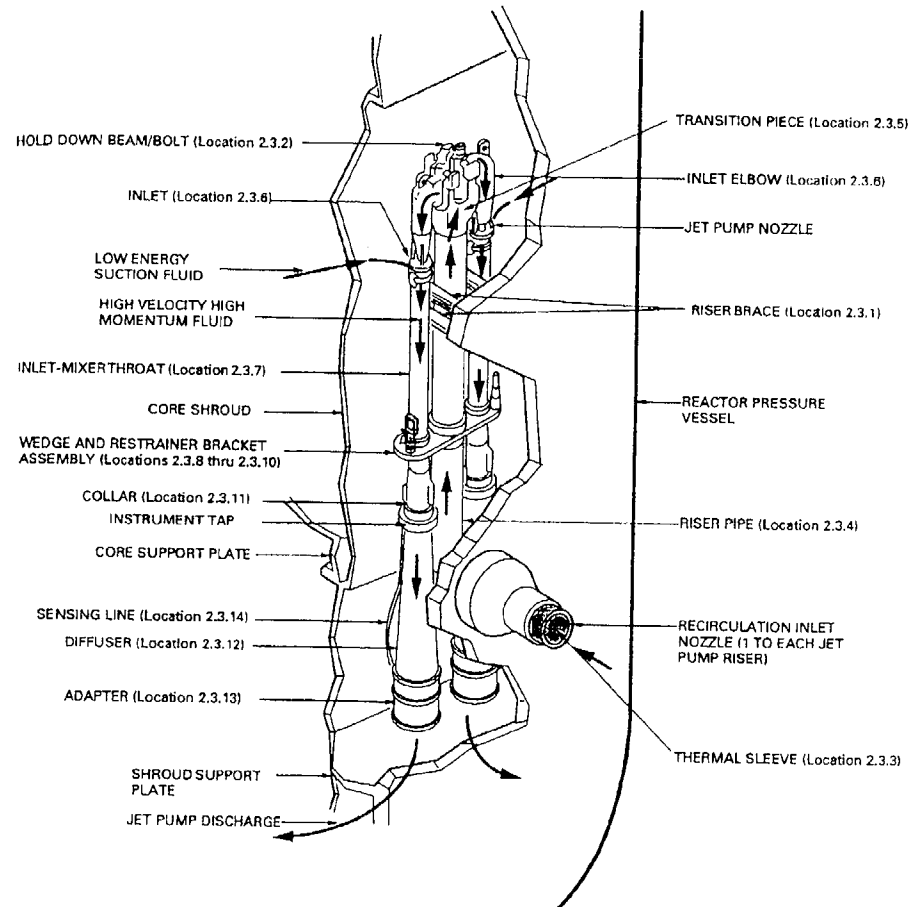
### **Review status:**

- **“BWRVIP-01”, Rev.1: SE 1994**
- **BWRVIP-01, Rev. 2: under U.S. NRC review**
- **BWRVIP-07: SE 12/99**
- **BWRVIP-63: under U.S. NRC review**
- **BWRVIP-76: under U.S. NRC review**

### **Notes:**

- **U.S. NRC required some revisions to BWRVIP-07; changes are incorporated in BWRVIP-76**
- **BWRVIP-76 to be comprehensive shroud I&E Guidelines**

## Configuration



## **Inspection history**

---

### **Inspections:**

- **Significant inspections performed per BWRVIP-41**

### **Findings:**

- **Indications/degradation reported in:**
  - ♦ **Holddown beams**
  - ♦ **Riser brace welds**
  - ♦ **Riser pipe welds**
  - ♦ **Diffuser welds**
  - ♦ **Riser brace-to-yoke welds**
  - ♦ **Wear at set screws and wedges**
  - ♦ **Instrument lines**
  - ♦ **Set screw tack welds**

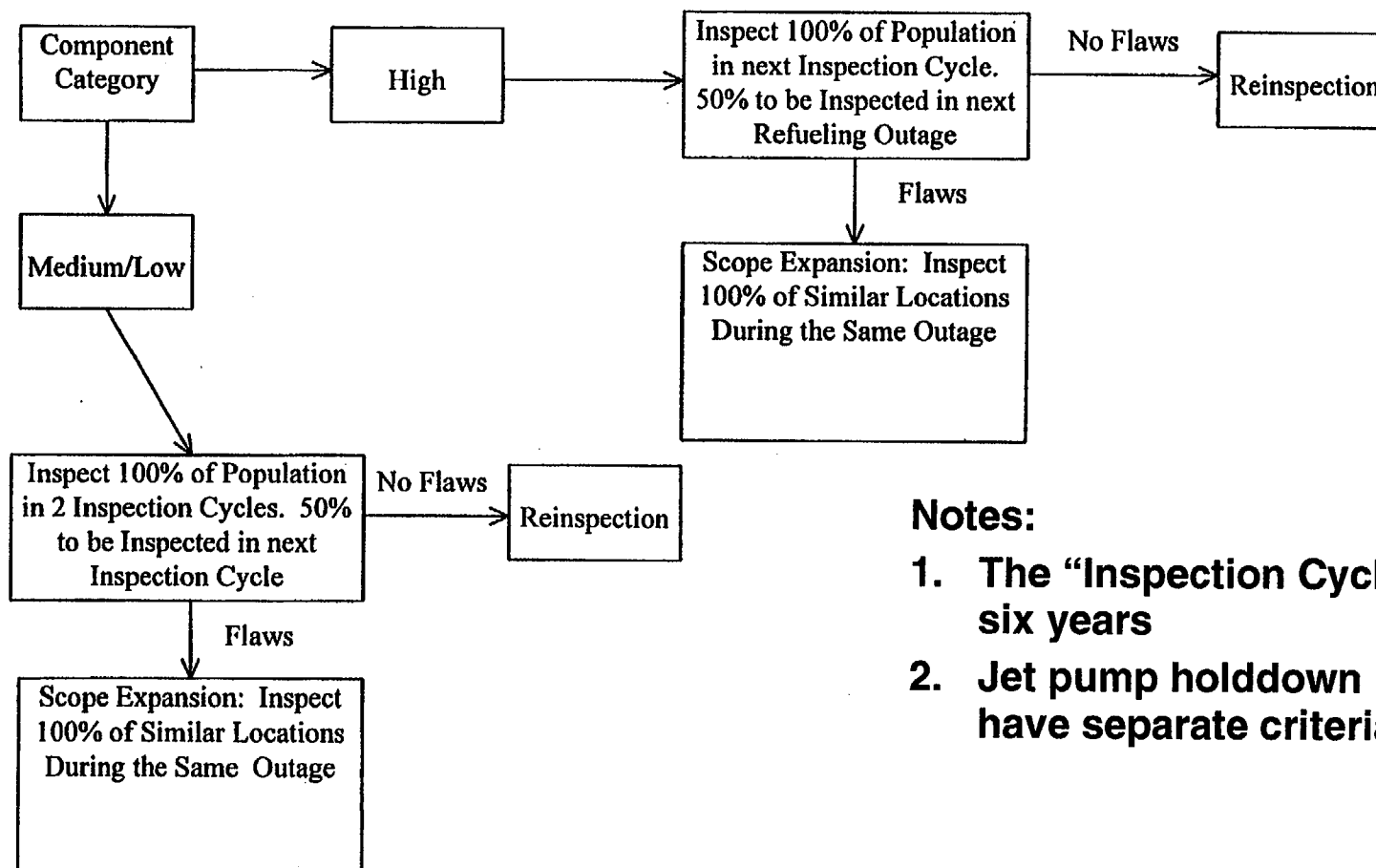
## **Inspection guidelines 1 of 3**

---

- **All welds ranked based upon safety significance (High/Medium/Low)**
- **Inspections not required for non-susceptible locations**
- **Inspection requirements for susceptible locations based upon ranking and the following charts**
- **For some components, analysis may alleviate inspection requirements**

## Inspection guidelines 2 of 3

### Baseline Inspection Requirements

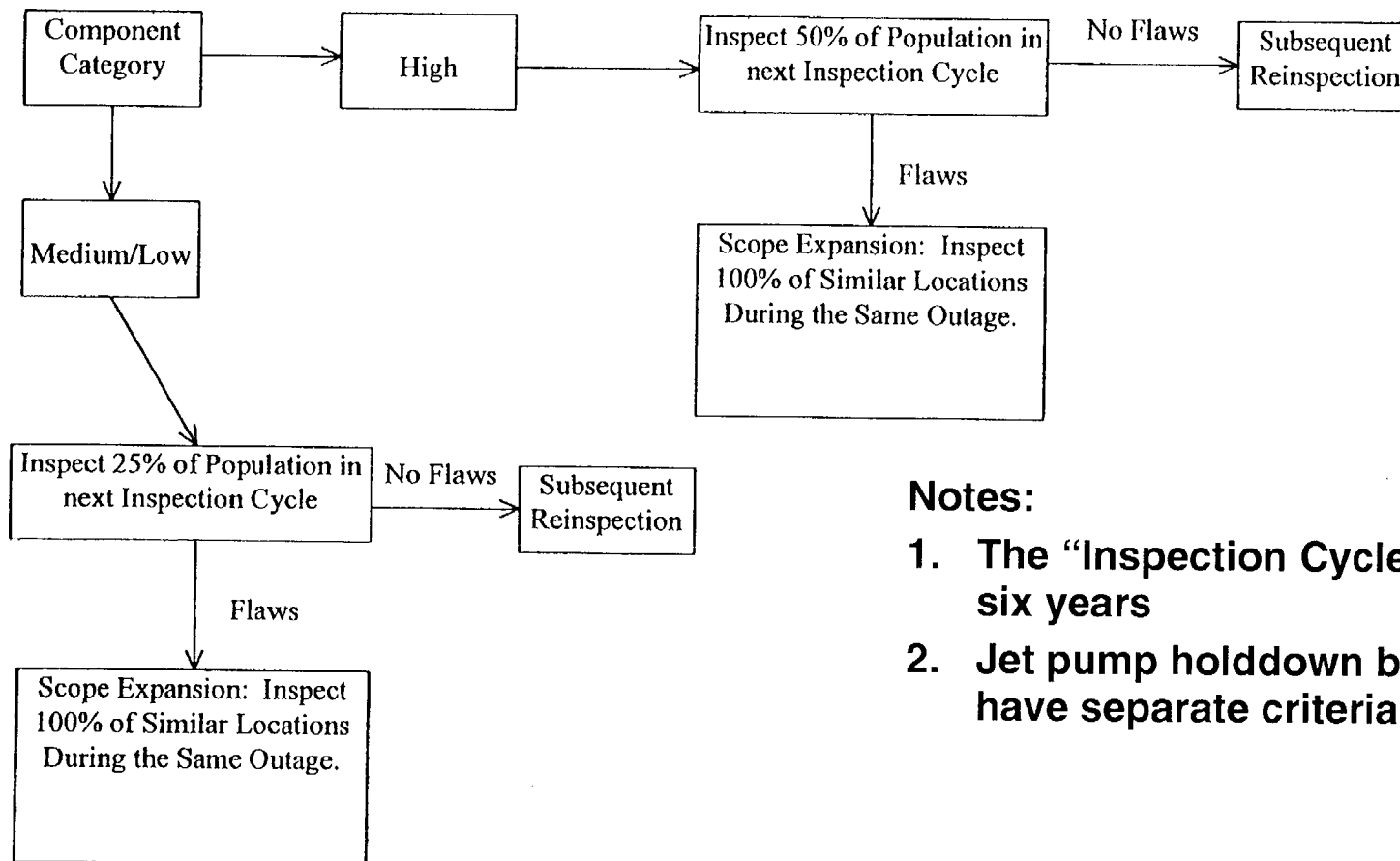


#### Notes:

1. The "Inspection Cycle" is six years
2. Jet pump holddown beams have separate criteria

## Inspection guidelines 3 of 3

### Reinspection Requirements



#### Notes:

1. The "Inspection Cycle" is six years
2. Jet pump holddown beams have separate criteria

## **Flaw evaluation**

---

- **Limit load techniques utilized for flaw evaluation**
- **DLL (BWRVIP-20) can be used**

## **Status of U.S. NRC review**

---

### **Review Status:**

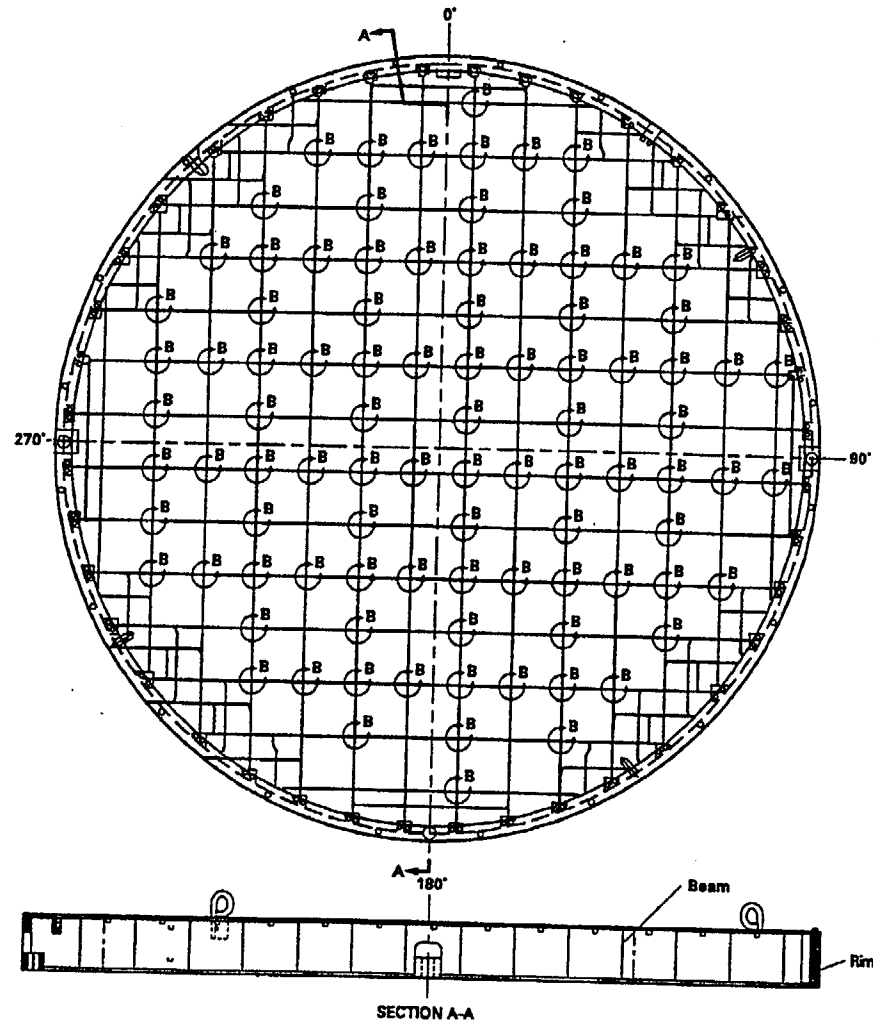
- **BWRVIP-41: SE 2/01**

### **Notes:**

- **Guidelines to be revised per SE**

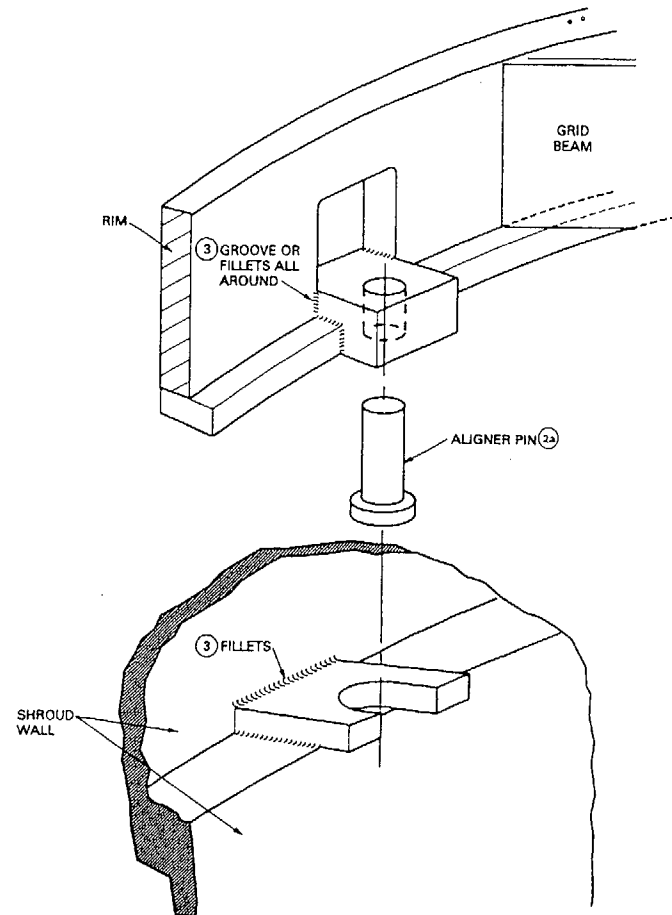
# Configurations 1 of 5

## BWR/2, BWR/3, BWR/4, BWR/5 Configuration



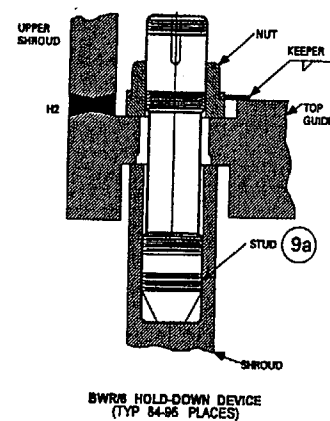
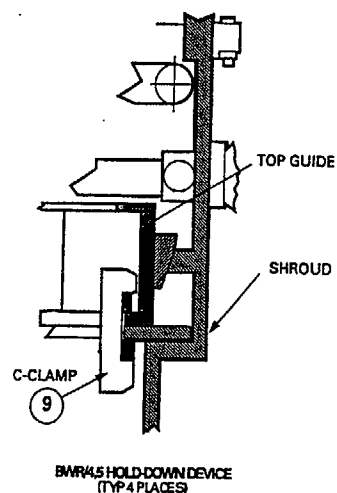
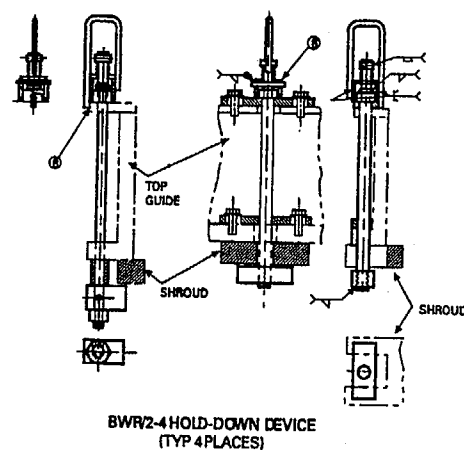
## Configurations 2 of 5

### Typical Vertical Aligner Pin Assembly



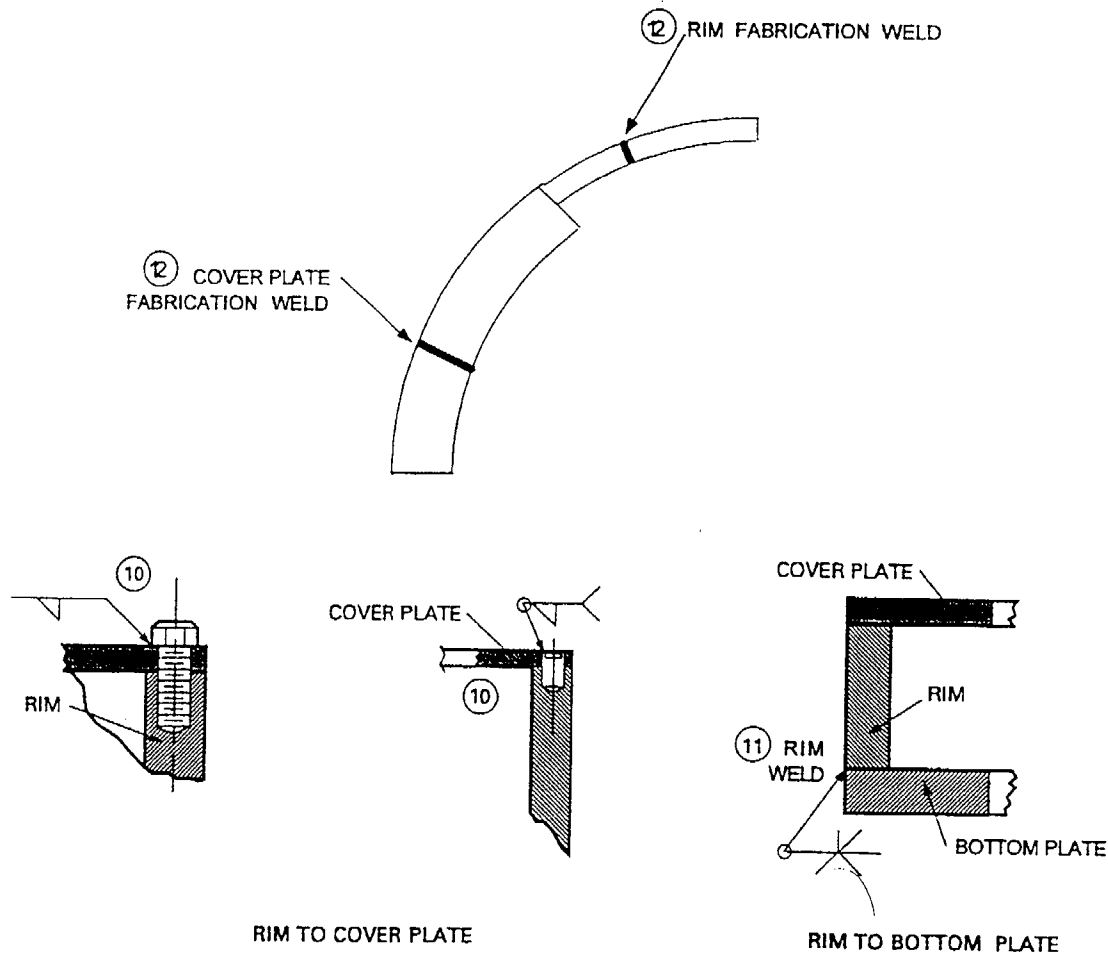
# Configurations 3 of 5

## Typical Holddown Assembly



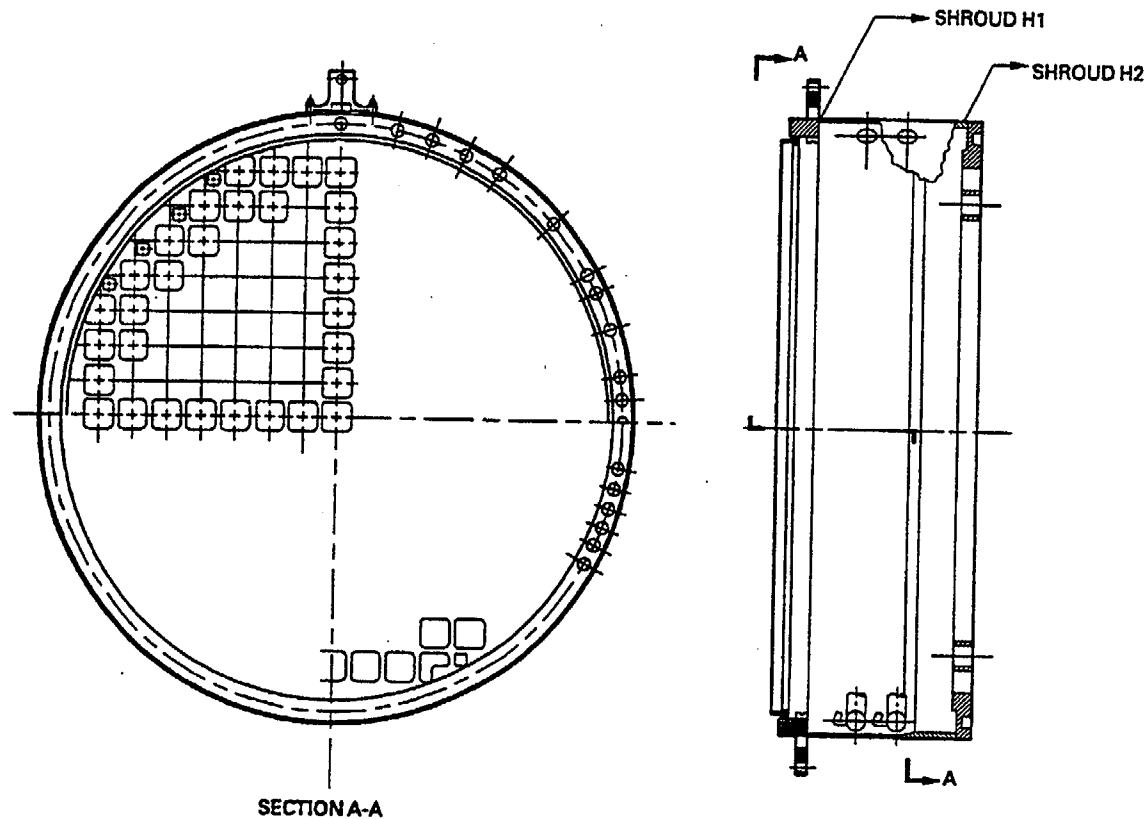
# Configurations 4 of 5

## Typical Rim Pins and Rim Welds



# Configurations 5 of 5

## BWR/6 Configuration



Note: Integral top guide may be more than one plate, connected by a fabrication weld (Location 17)

## **Inspection history**

---

### **Inspections:**

- **Substantial VT-1 and VT-3 inspections per BWRVIP-26 and prior SILs**
- **UT inspection of grid beams at Oyster Creek**

### **Findings:**

- **Oyster Creek reported indications in top guide grid beams**
- **Rim weld cracking in non-GE BWR**
- **Two indications in tack welds and keepers**

# Inspection guidelines 1 of 4

Location	Description	Applicability	Results of Structural Analysis/ Consequence of Failure	Inspection Strategy	Plant-Specific Analysis	Modifications/ Repair
1	Grid Beam and Beam- to-Beam Crevice Slot	BWR/2-5	No safety consequence of single failure at this location. Failure of upper beam has no impact. Failure of lower beam could cause some core instrument damage, but would not interfere with safe shutdown.	None required. (This recommendation will be reevaluated in 1997 after the Oyster Creek UT and sample exam.)	N/A	N/A
2, 3	Aligner Pins and Sockets in Top Guide and Shroud	BWR/2	Aligner hardware is redundant to brackets between the top guide and shroud. The example analysis demonstrates that with complete rim weld cracking, and one of eight brackets failed, the maximum top guide lateral displacement is 0.5".	None required.	N/A	N/A
		BWR/3,4 without wedges	Assuming the lateral reactions are equally shared by two aligners, the maximum shear stress on the pin is less than the allowable in the example analysis. With a minimum socket/block weld size of 0.5", a maximum of 35% of the weld for vertical pins or 70% of the weld for horizontal pins is required to resist shear. With complete aligner failure, and assuming no other means of lateral restraint, the maximum top guide horizontal displacement is limited to about 5 inches by the top guide contacting the upper shroud. Control rods can insert if static displacement is <2.5 in. SLC injection is also available to shut down the reactor.	VT-1 of welds in two adjacent aligner assemblies every other cycle. If cracking is found, expand inspection to all four aligner assemblies.	Analysis to account for plant-specific dynamic loading. Intent to reduce load and reduce % of weld area needed to resist load. If less than 20% of the weld is required, no inspection is needed.	No inspection required if wedges are added.

# Inspection guidelines 2 of 4

Location	Description	Applicability	Results of Structural Analysis/ Consequence of Failure	Inspection Strategy	Plant-Specific Analysis	Modifications/ Repair
8	Hold-down Assemblies	BWR/2-4 devices	With the assumed conservative vertical loading, many of the 206-inch, 12160 pound top guides, if unrestrained during a faulted event scenario, would lift. Plants in this category were designed with hold-down devices. See Appendix A for plant evaluations.	For plants whose faulted vertical loads exceed the top guide weight, a VT-1 inspection where the hold-down latches to the shroud should be done, inspecting two hold-down devices, 180° apart, every other cycle.	For plants whose faulted vertical loads exceed the top guide weight, a plant specific analysis with improved, best estimate LOCA uplift force values may change the conclusion so that inspection would not be required.	No inspection required if a modified hold-down device were installed that was SCC resistant.
9		BWR/4,5 C-clamps	The C-clamps are 316L stainless, welded to the top guide with creviced welds. It is possible, though unlikely, that the C-clamps could work free if the welds to the top guide cracked.	For plants whose faulted vertical loads exceed the top guide weight, a VT-3 inspection of each clamp assembly each 10-year interval is recommended.	Same as above	Same as above
9a		BWR/6 Studs	The studs, numbering 84-96, are highly redundant, and the material in bolting applications has not demonstrated SCC. Inspection can be infrequent and of a general nature to look for gross cracking or total failure of single studs.	VT-3 each 10-year interval.	N/A	N/A

# Inspection guidelines 3 of 4

Failure Location	Description	Applicability	Results of Structural Analysis/ Consequence of Failure	Inspection Strategy	Plant-Specific Analysis	Modifications/ Repair
10, 11	Rim Pins and Rim Weld	BWR/2	Even if rim pins or rim weld are failed, lateral loads are transferred to the brackets between the top guide and shroud, so there is no impact on top guide function.	None required.	N/A	N/A
		BWR/3,4 without wedges	The rim pins are captured and perform their function even if the fillet welds that retain them in place fail.	None required for rim pins.	N/A	N/A
			If the rim weld to the bottom plate is assumed to be failed, all lateral load is assumed to transfer to the shroud through the lower reinforcement block pins (4) and the bottom plate. Example analysis assuming a high accident loading shows that plants with dual pins with a diameter less than 0.68" exceed the allowable stress limit. In example analysis of the single pin configuration, all plants exceed the allowable stress limit if the rim weld is assumed to be failed.	Enhanced VT-1 every other cycle of rim weld locations accessible during normal refueling activities. If cracking is found, expand inspection to 25% of one side of the rim weld for qualitative evaluation.	No inspection required if analysis of reinforcement block pins with plant-specific loads shows that lower pin(s) have acceptable stress with the rim weld fully cracked.	No inspection required if wedges are installed between the top guide and shroud.
		BWR/4,5 with wedges	Even if rim pins or rim weld are failed, lateral loads are transferred to the wedges between the top guide and shroud, so there is no impact on top guide function.	None required.	N/A	N/A
12	Rim and Cover Plate Fabrication Welds	BWR/2-5	Because of the redundancy of the grid beams to the rim through the cover and bottom plates, failure of these welds has minimal consequence.	None required.	N/A	N/A

# Inspection guidelines 4 of 4

Failure Location	Description	Applicability	Results of Structural Analysis/ Consequence of Failure	Inspection Strategy	Plant-Specific Analysis	Modifications/ Repair
13	Eye Bolt Boss	BWR/2-5	These components have no function during normal operation, and serve no safety function for off-normal transients.	None required.	N/A	N/A
14	Support Bracket to Shroud Welds	BWR/2	The brackets are captured in place by the combination of small clearance between the top guide and bracket and the fillet welds along the shroud on both sides of the bracket. Since the brackets are loaded in compression against the shroud, they will function even if fillet welds are cracked. Also, there is redundancy in having eight brackets.	None required.	N/A	N/A
15	Threaded Boss to Cover Plate	BWR/2-5	These components have no function during normal operation, and serve no safety function for off-normal transients.	None required.	N/A	N/A
16	Lifting Lug to Rim Bolt or Weld	BWR/2-5	These components have no function during normal operation, and serve no safety function for off-normal transients.	None required.	N/A	N/A
17	Integral Top Guide Fabrication Welds	BWR/6	Since the BWR/6 top guide is single piece construction, the worst consequence of weld cracking in the typical fabrication is that cracking in both HAZs could cause a small piece, containing the weld, to fall out of the top guide onto the core plate. The top guide would still perform its function in this case, and the failure would be observable while moving fuel bundles during the next refueling activity.	None required for typical fabrication	Determine from fabrication records, if available, that top guide plate welds are arranged as described here, or comparably.	N/A

## **Flaw evaluation**

---

- **For flaw evaluation of the grid beams, linear elastic fracture mechanics techniques are used**
  - ♦ **Equations given in Appendix B of BWRVIP-26**
- **For other locations, specific flaw evaluation methods are not defined**
- **Evaluations of components other than grid beams based upon stress analyses**

## **Status of U.S. NRC review**

---

### **Review Status:**

- **BWRVIP-26: SE 9/99**

### **Notes:**

- **Guidelines to be revised per SE**

# **BWRVIP-75: IGSCC in BWR piping**

## **IGSCC History**

---

- **1960s: Scattered Incidents of IGSCC**
- **Mid - 70s: Small diameter piping IGSCC association with weld residual stresses**
- **Late - 70s: Larger diameter piping IGSCC**
- **Mid - 80s: IGSCC in 304L and 316L in creviced locations and areas of cold work**

# **BWRVIP-75: IGSCC in BWR piping, History of Industry Response**

---

- **Collaboration on remedy development**
  - ♦ BWR Owners Group for IGSCC Research
  - ♦ BWROG I 1979-1983; BWROG II 1984-1988.
  - ♦ New developments and adopted innovations
- **Plant-specific decisions on remedy selection varied**
  - ♦ Full or partial piping system replacements
  - ♦ Local repair and augmented inspection
  - ♦ Local mitigation and augmented inspection
- **Regulatory guidance on remedy implementation**  
NUREG-0313 Revision 2, 1988

# **BWRVIP-75: IGSCC in BWR piping, NUREG-0313, Rev. 2 categories**

---

Category	Weld Description	Inspection Frequency
A	Resistant materials	25% sample every 10 years (Same as Code)
B	Non-resistant materials stress improved within 1 <sup>st</sup> 2 years of operation	50% every 10 years (at least 25% in 6 years).
C	Non-resistant materials stress improved after 2 years of operation	Once within 2 cycles of stress improvement then once per every 10 years
D	Non-resistant materials, no stress improvement	100% every 2 refueling cycles
E	Cracked - reinforced by weld overlay or mitigated by stress improvement	Every 2 refueling cycles
F	Cracked – Inadequate or no repair	Every refueling outage
G	Non-resistant, not inspected	Next outage

# **BWRVIP-75: IGSCC in BWR piping, IGSCC control strategies implemented**

---

- **Detect IGSCC before damage compromises system integrity**
- **Remove found defects before continued growth compromises system integrity**
- **Prevent initiation by introducing a resistant material**
- **Maintain structural integrity and prevent unacceptable growth by reinforcing with a resistant material**
- **Prevent initiation by modifying the residual stress distribution**
- **Prevent further growth by modifying the residual stress distribution**
- **Slow initiation and growth using improved water chemistry**

# **BWRVIP-75: IGSCC in BWR piping, Reasons to revise NUREG-0313**

---

- **Since 1984, losses in capacity factor have been dramatically reduced**
- **IGSCC countermeasures are effective**
  - ♦ **Inspections are confirming little or no new crack initiation and growth in existing cracks**
- **Inspections result in radiation dose to personnel**
  - ♦ **Minimize inspections, particularly those that do not have an impact to safety**

# **BWRVIP-75: IGSCC in BWR piping, BWRVIP Approach**

---

- **All piping categories evaluated for appropriate changes to inspection frequencies**
- **Service experience and deterministic evaluations used to evaluate performance**
  - ♦ **Inspection results**
  - ♦ **Effectiveness of HWC and NMCA**
  - ♦ **Effectiveness of IHSI and MSIP**
  - ♦ **BWRVIP crack growth studies for stainless steel and nickel-base alloys**
- **Generic risk-informed studies used to support the technical basis for new inspection frequencies**

# BWRVIP-75: IGSCC in BWR piping, GL88-01 vs. BWRVIP-75 Inspections

Category	Weld Description	Existing Inspection Frequency of GL 88-01	Proposed Inspection Frequency per BWRVIP-75	
			NWC	HWC
A	Resistant Materials	25% every, 10 years at least 12% in 1 <sup>st</sup> 6 years	B-F = 25% every 10 years B-J = 10% every 10 years	10% every 10 years,
B	Non-Resistant Materials Stress Improved within 1 <sup>st</sup> 2 years of Operation	50% every 10 years at least 25% in 1 <sup>st</sup> 6 years	25% every 10 years	10% every 10 years
C	Non-Resistant Materials Stress Improved after 2 years of Operation	All within 2 cycles of SI, then all within 10 years, at least 50% within 1 <sup>st</sup> 6 years	25% every 10 years	10% every 10 years
D	Non-Resistant Materials, No Stress Improvement	Every 2 refueling Cycles	100% every 6 years	100% every 10 years, at least 50% in 1 <sup>st</sup> 6 years
E	Cracked – Reinforced by Weld Overlay	Every 2 refueling Cycles	25% every 10 years	10% every 10 years
	Cracked – Mitigated by Stress Improvement	Every 2 refueling Cycles	100% every 6 years	100% every 10 years, at least 50% in 1 <sup>st</sup> 6 years
F	Cracked – Inadequate or No Repair	Every Refueling Outage	Every Refueling Outage	Every Refueling Outage
G	Non-Resistant, Not Inspected	Next Outage	Next Outage	Next Outage

# **BWRVIP-75: IGSCC in BWR piping, Conclusions and Status**

---

- **NRC requirements and IGSCC countermeasures have been effective in managing IGSCC**
- **A revision of the inspection frequencies in NUREG-0313 is warranted and justified based on BWRVIP-75**
- **NRC has issued safety evaluation**
- **BWRVIP developing responses to address open items in safety evaluation**

# Conclusion

---

- **The BWRVIP has developed a program that is broad in scope**
- **The BWRVIP Program includes the appropriate elements including inspection, evaluation, repair and mitigation to assure reactor internals integrity**
- **Use of the BWRVIP Program during the period of a renewed license provides an adequate aging management program**

March 27, 2001

# **NEI 95-10 Industry Guideline For Implementing The License Renewal Rule 10 CFR Part 54**

Presentation to  
Advisory Committee on Reactor Safeguards  
Plant License Renewal Subcommittee

*Doug Walters  
Nuclear Energy Institute*



March 27, 2001

## **NEI 95-10**

### **■ Key Elements**

- Reference to the GALL Report
- Standard application format and content
- Table of components/commodity groups subject to an aging management review



## NEI 95-10, Revision 3

### ■ Revision 3 Changes

- Included a reference to the GALL Report
- Included PRA summary report and EOPs as potential information sources
- Modified components/commodity group table
- Incorporated selected references



## NEI 95-10, Revision 3

### ■ Revision 3 - Additional Changes

- Drawings printable in black and white
- Guidance to reflect when an aging effect requires management
- Inclusion of SAMGs as potential information sources
- Incorporation of additional selected references



## **NEI 95-10**

- Future changes to reflect lessons learned from the demonstration effort
- Goal is NRC endorsement without exception

