

1 MEMBER WALLIS: Materials and the fluents?

2 MR. MEDOFF: The fluents through 60 years  
3 or through whatever the effective full-power year, so  
4 it's 52 for one unit and 55 for effective full-power  
5 years for the other unit.

6 MEMBER WALLIS: So it's just a  
7 calculation. There's no test?

8 MR. DUDLEY: Well, the testing is the  
9 actual charpy B notch data that's used to --

10 MEMBER WALLIS: Which is based on samples?

11 MR. DUDLEY: Right. What the surveillance  
12 program is required to do is there's an educated guess  
13 that what the most limiting materials are for the  
14 vessel and they included in the surveillance capped  
15 program, which includes capsules installed inside the  
16 reactor vessel, and they take them out periodically to  
17 check on the embrittlement correlations.

18 MR. DUDLEY: And also feed it back into  
19 calculations --

20 MR. MEDOFF: For the Upper Shelf and for  
21 the RTPTS.

22 MR. HALE: I might point out, Jim, that  
23 some of those capsules are put in locations where they  
24 see higher fluents. In fact, one of the criteria the  
25 staff has is that, at the end of the current license

**NEAL R. GROSS**

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

1 period, or that you have to pull out a sample that  
2 projects what the actual performance characteristics  
3 would be at year 60.

4 MR. MEDOFF: We had an open item on the  
5 surveillance capsule programs. We did confirm that  
6 the programs will project through 60 years of plant  
7 life.

8 MR. DUDLEY: The second program is the  
9 pressurized thermal shock screening criterion, which  
10 is 270 degrees for plates, forgings, and actual welds,  
11 and 300 degrees for circumferential welds. And as you  
12 can see from the values in the summary table, the  
13 results of the applicants calculations for both Units  
14 1 and 2 are well below the PTS screening criterion,  
15 and the reason for that is just the materials that  
16 were used in the construction of the vessel.

17 MEMBER ROSEN: It seems extraordinarily  
18 good.

19 MR. DUDLEY: Yes, they were able to select  
20 the weld materials that gave them such a low PTS.

21 MEMBER ROSEN: These are numbers for  
22 extended operation?

23 MR. DUDLEY: That's for 60 years, yes. Or  
24 is it for 48? The staff also performed independent  
25 calculations for these PTS values.

1           In the Unit 2 pressure temperature curves  
2           are acceptable through 23 effective full-power years  
3           and 21 effective full-power years respectively. The  
4           applicant updates the PT curves as necessary for  
5           continued operations and submits them to the staff for  
6           review and approval on a periodic basis. And updated  
7           PT curves will be available prior to the period of  
8           extended operation.

9           The next subject that we're getting into  
10          is fatigue, and I have Mr. John Fair here, who is the  
11          reviewer in that area, and he'll provide you more  
12          detailed information than my following summary.

13          The applicant determined that the number  
14          of cycles used for the design of Class I components  
15          found a number of cycles anticipated for 60 years of  
16          plant operation; and, therefore, the fatigue analyses  
17          within the scope of license renewal remain valid for  
18          the period of extended operation. Additionally, the  
19          applicant indicated that, with the exception of the  
20          reactor coolant sample lines, the remaining component  
21          analyses remain valid for the period of extended  
22          operations. The applicant did a further evaluation of  
23          the sample lines and found them acceptable for the  
24          period of extended operation, and the staff concluded  
25          that the applicant's evaluation is acceptable.

**NEAL R. GROSS**

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

1 MEMBER ROSEN: Let me see if I understand  
2 what you just said. What they did was re-calculate  
3 the number of cycles they were actually going to have  
4 based on the experience they've had to date and said  
5 that's actually equal to or less than what we thought  
6 we would have had for 40 years.

7 MR. DUDLEY: That's correct.

8 MR. FAIR: This is John Fair. For the  
9 Class II and III systems, there's kind of a simple  
10 criteria for stress allowable that you have less than  
11 7,000 cycles. So what they did was projected that  
12 they were going to have greater than 7,000 cycles for  
13 the period of extended operation.

14 The code requires you, if you're going to  
15 exceed 7,000 cycles, to have a knock-down factor on  
16 the allowable stress that you can have for those  
17 bending loads. So what the applicant did was check to  
18 see that their allowable stress was less than that  
19 allowable stress with the knock-down factor,  
20 considering the number of cycles for the period of  
21 extended operation.

22 MR. DUDLEY: And that's an explanation for  
23 the additional evaluation done for the sample lines  
24 since they exceeded the 7,000 cycles.

25 MEMBER ROSEN: The stresses were low

**NEAL R. GROSS**

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

1 enough.

2 MR. DUDLEY: The applicant also evaluated  
3 the impact of the environment on the fatigue life of  
4 the six components identified in NUREG CR62.60. The  
5 results of the evaluation indicate that, with the  
6 exception of the surge line, all the locations were  
7 below the ASME code fatigue limit of 1.0. The  
8 applicant committed to take further actions to address  
9 the environmental life of the surge line prior to the  
10 period of extended operation. The staff concluded  
11 that the applicant's evaluation and its commitment for  
12 further action to address the surge line are  
13 acceptable.

14 Any further questions? I'll move onto the  
15 next.

16 MEMBER FORD: Just so I understand it, the  
17 environmental multiplies the factor of 2 and 20; is  
18 that right?

19 MR. FAIR: No, the 2 and 20 factors are  
20 factors that the ASME used when they were constructing  
21 the fatigue design curve from the experimental data.  
22 The environmental factors we're talking about here are  
23 the later data that was taken that determined that  
24 there was less fatigue life in reactor order  
25 environment than was originally anticipated when the

**NEAL R. GROSS**

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

1 curves were developed. So the factors or the ratio of  
2 fatigue life in the reactor order environment to  
3 fatigue life and air.

4 CHAIRMAN BONACA: This is the ARGON data?

5 MR. FAIR: This is the ARGON data.

6 MR. DUDLEY: Okay. The next question we  
7 had TLAA was leak before break, and the staff verified  
8 that the analysis of the allowable flaw size under  
9 normal and faulted loads is valid for the period of  
10 extended operations. The applicant will use the  
11 fatigue monitoring program to ensure that the number  
12 of design cycles will not be exceeded; and, therefore,  
13 the assumed flaw size is not invalidated.

14 MEMBER WALLIS: So where are these flaws?

15 MR. DUDLEY: It's an assumed flaw in the  
16 reactor coolant piping.

17 MEMBER WALLIS: It's anywhere in the  
18 piping?

19 MR. DUDLEY: Yes.

20 MEMBER WALLIS: In the primary system?

21 MR. DUDLEY: Yes. I may need some help  
22 with this. Simon?

23 MR. SHENG: This is Simon Sheng with the  
24 Materials and Chemical Engineer Branch. These LBB  
25 application applied to the primary. And usually, when

**NEAL R. GROSS**

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

1 you perform an LBB analysis that you just assume,  
2 assume a flow size of any shape, usually. You keep on  
3 extending the size of flow until you can get 10 GPM,  
4 which is 10 times of the 1 GPM leakage rate that can  
5 be detected by the plant's leakage detection system.  
6 So that's the first part of analysis to determine the  
7 leakage flow size.

8 And the second part is that you want to  
9 make sure that the flow size is stable. In other  
10 words, the second step of analysis is to perform a  
11 mechanic analysis to determine the allowable flow  
12 size, beyond which the pipe is going to severe in two  
13 instantly. So usually, the margin between this ratio  
14 is two. That means that when the leakage flow size is  
15 at a certain length, it's still far shorter than the  
16 allowable flow size, so that way we can be sure that  
17 the leakage will be detected before it reaches its  
18 allowable flow size.

19 MEMBER WALLIS: It's a factor of two?

20 MR. SHENG: Yes, there's a factor of two  
21 between the allowable flow size and the leakage flow  
22 size. But remember that we also have a factor of 10  
23 into the leakage detection system. The detection  
24 system can detect 1 GPM, and, for this case, I'm not  
25 sure whether that's a 1 GPM or 0.5 GPM. But anyway,

**NEAL R. GROSS**

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

1 there's a factor of 10 so that the leakage rate is  
2 either 5 GPM or 10 GPM, which would make the leakage  
3 flows much, much larger, so that makes sure that we  
4 can detect it.

5 MR. DUDLEY: Okay. Any other questions?

6 MEMBER LEITCH: I do have a question  
7 about, I think it's GSI 168, I could be wrong about  
8 the number, but it concerns EQ low-voltage instrument  
9 and control cables, and there is, I guess, a  
10 recommendation about ready to come out, but when  
11 extrapolating out to 60 years, the licensee should  
12 take a look at environmental conditions, that is  
13 temperature, humidity, radiation, that the cables are  
14 exposed to and that they also ought to look at any  
15 adverse conditions that are affecting these cables and  
16 have water dripping on them or other signs. In other  
17 words, they ought to do a visual inspection. Has this  
18 applicant committed to that program or something  
19 similar, or have they just committed to do whatever  
20 comes out of GSI 168, or how has that whole issue been  
21 handled?

22 MR. DUDLEY: At this point, that would be  
23 handled through the operating plant issue. I'm not  
24 sure whether we got into it in license renewal space.

25 MEMBER LEITCH: There's a section on that

**NEAL R. GROSS**

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

1 that addresses extrapolating from 40 up to 60 years,  
2 and that's the question that I'm concerned about.

3 MR. KUO: Dr. Leitch, I think the  
4 applicant, in this case, they have committed to some  
5 of the programs in GALL Chapter 10, either E1 or E2 or  
6 E3, depending on the cables. And the GSI 168 is being  
7 resolved in the Part 50 space. Whatever the outcome  
8 come out, if there are action to be taken, the  
9 licensee will have to follow the action required of  
10 them. So it's really a separate thing right now.  
11 Right now, they are meeting all the requirements that  
12 we have asked them to do. They are providing aging  
13 management programs, according to --

14 MR. HALE: If I could, we did an  
15 assessment with regards to adverse localized  
16 environments as part of our review, and that is  
17 documented in summary in the application, talking  
18 about, you know, what we assume in the EQ analysis  
19 besides what's actually experienced, plus additional  
20 inspections with regards to adverse localized  
21 environments. You know, this deals with the issue of  
22 temperature, radiation, and moisture.

23 And we have a lot of margin in our EQ  
24 analysis relative to what it's actually exposed to  
25 versus, you know, what's in the design, so we have a

**NEAL R. GROSS**

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

1 lot of margin from our EQ standpoint, even for the 60-  
2 year evaluation.

3 The other thing, and maybe Caudle can  
4 mention this, is one of the inspections that the guy  
5 did who went into containment was to look at relative  
6 or spatial relationships between cable and piping  
7 inside the containment. And, at least St. Lucie's  
8 case, we have a very good configuration with regards  
9 to our cable routing relative to high-temperature,  
10 high-radiation piping.

11 I would say, in terms of whatever falls  
12 out of the GSI 168, of course, we'll have to implement  
13 in terms of whatever the criteria. If it says we have  
14 to go do this or this, we'll have to address it as  
15 part of our EQ program.

16 MEMBER LEITCH: I guess what I'm a little  
17 confused about is really just the regulatory process.  
18 As I understand the closure of GSI is going to be some  
19 kind of a document that's, more or less, information  
20 and a suggestion to the licensee. I mean, the  
21 regulatory information summary --

22 MR. KUO: It depends on the GSI itself.  
23 Some GSI resolutions has no addition actions required.  
24 Others, they do have additional requirement. Then we  
25 will send out the generic letter and implementing the

**NEAL R. GROSS**

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

1 requirements. Like, for instance, in the past, we  
2 have USI A46, the seismic kind of thing. Then, later  
3 on, we issue the generic 8820, so all the plants  
4 covered in that generic letter will have to take  
5 actions to implement the requirements. So it depends  
6 on what comes out from the GSI.

7 MEMBER LEITCH: Yes, well, I'm reasonably  
8 sure that the GSI has got to be a document called a,  
9 is it an RIS; is there such a document as that? And  
10 it looks like it's a suggestion to the industry that  
11 here's some things that would be a good thing to do,  
12 and, oh, by the way, if you're going to license  
13 renewal, it would also be good to make sure your  
14 environmental conditions have sufficient margin and  
15 make sure that you visually inspect it. But I don't  
16 see a requirement. So on one hand, we have people  
17 saying, well, we'll do whatever GSI 168 requires us to  
18 do, but, yet, it looks as though GSI 168 is about  
19 ready to be closed, and there's no requirement, it's  
20 only suggestions.

21 MR. KUO: I will find out more about that  
22 particular one later next time I'm coming. I will  
23 come back.

24 MR. HALE: I would like to indicate, P.T.,  
25 that you do have a requirement to address applicable

1 GSI's as part of the guidance for license renewal. In  
2 fact, we have a summary in the front that talks about  
3 looking at, and we're required periodically to take a  
4 look at what GSI's should be applied when you're doing  
5 license renewal. I'm not sure where those  
6 requirements are. I'm not sure if it's in the SRP or  
7 whether it's in one of the branch technical positions  
8 associated with it.

9 We had a statement in here, for example,  
10 on GSI 168 in the application because, at that time,  
11 it was indicated that that may be a potential. But  
12 there's a summary in there that says there's ongoing  
13 research. Until that time, it's really not one that  
14 can be addressed in our application at this time.  
15 There is a requirement, P.T.; I'm not sure where it's  
16 located.

17 MR. KUO: Dr. Leitch was talking about a  
18 different question, I think. He's asking a different  
19 question. So you have a GSI at 168 and got it  
20 resolved. There may not be any actions required, any  
21 requirements, so how do we know or what is the process  
22 for the licensees to implement some of the result or  
23 requirements? Whether there's requirements or not, we  
24 don't know. That's your question.

25 MEMBER LEITCH: That's exactly my

**NEAL R. GROSS**

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

1 question.

2 MR. KUO: Okay. I will come back to you  
3 on that.

4 MEMBER LEITCH: Okay, thank you. It's not  
5 just the St. Lucie issue, either.

6 MR. KUO: Right, I understand.

7 MEMBER LEITCH: It's from, you know, here  
8 on out, everybody will have this issue.

9 MR. KUO: Well, the issue is GSI 168 or  
10 the whole process?

11 MR. DUDLEY: We have the reviewers here  
12 that reviewed portions of the TLAA concerning the core  
13 barrel repair, and if I could have them come to the  
14 table. Just to give an overview --

15 CHAIRMAN BONACA: We need to move on  
16 because, I mean, we are still running real late, and  
17 we have a scheduled federal meeting at 3:30. I'll  
18 present some options at the end of this presentation  
19 on what we can do at the federal register meeting.

20 MEMBER ROSEN: Are you doing this for the  
21 core support barrel because of the questions that were  
22 asked at this meeting?

23 MR. HALE: Yes.

24 MEMBER ROSEN: I think I might have been  
25 the person who raised those questions, and I since

**NEAL R. GROSS**

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

1 read the SER portion that I didn't know about before,  
2 I missed, and I am comfortable with what's in the SER.

3 MR. HALE: Oh, okay. Thank you.

4 MEMBER ROSEN: So I'm going to give you a  
5 pass on my behalf.

6 MR. DUDLEY: Good. Then we can go to the  
7 conclusion slide for my presentation.

8 CHAIRMAN BONACA: I thought the issue was  
9 quite heavily discussed.

10 MR. DUDLEY: Yes, so I'll go to the final  
11 slide, which will just summarize the next steps we  
12 need to take.

13 MR. HARTMAN: I am Mark Hartzman. Thank  
14 you.

15 MEMBER ROSEN: That is the shortest  
16 presentation on record.

17 CHAIRMAN BONACA: That was a great  
18 presentation.

19 MR. DUDLEY: The staff has resolved all  
20 the open confirmatory items and is in the process of  
21 revising safety evaluation reports. The SER is  
22 scheduled to be issued on or before July 8<sup>th</sup>. The  
23 staff has issued the inspection reports that will be  
24 attached to the SER. The regional administrator's  
25 letter is scheduled to be issued on July 21st of this

**NEAL R. GROSS**

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

1 year. And we plan to come back to the ACRS full  
2 committee in September and issue the license on or  
3 before October 3<sup>rd</sup>. And if there's no other  
4 questions, that's the end of my presentation, and I  
5 can turn it over to Jack Cushing, who's been  
6 instrumental in developing the interim guidance  
7 process.

8 CHAIRMAN BONACA: Thank you very much for  
9 your presentation. What I would like to do, actually,  
10 is one way to resolve some of the time pressure, so  
11 let's go in this order, and we'll do without a break  
12 right now. We'll just hear this presentation. If you  
13 could contain it, you know, to a reasonable time.

14 MR. CUSHING: Yes, I understand.

15 MR. KUO: Jack, before you start, I just  
16 want to wrap up one issue. Dr. Leitch asked a  
17 question about the GSI 168. I just got the words that  
18 the staff has committed to issue a RIS on this one.

19 MEMBER LEITCH: Right. And that stands  
20 again for Regulatory --

21 MR. KUO: Information Summary.

22 MEMBER LEITCH: Okay. Thank you.

23 MR. CUSHING: All right. Hello. Jack  
24 Cushing. I'm a project manager in the License Renewal  
25 Branch, and I'd like to discuss the Interim Staff

**NEAL R. GROSS**

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

1 Guidance process. This process is at a draft stage  
2 and is going through staff concurrence. This  
3 presentation is focused on the process, how we  
4 developed the guidance, not the technical aspect of  
5 any specific ISG.

6 What is an ISG, and why do we need it?  
7 Interim Staff Guidance is new or expanded guidance  
8 that the staff needs to communicate in a timely manner  
9 to current and future applicants, as well as other  
10 stakeholders. And ISG is guidance that will be  
11 incorporated into the license renewal guidance  
12 documents, like the guidance documents they'll be  
13 incorporated into. They provide an approved method  
14 but not the only method of meeting the regulation. An  
15 applicant does not have to follow the guidance, but  
16 they do have to demonstrate to the staff that their  
17 alternative method complies with the regulations.

18 Why do we need the ISG process? License  
19 renewal is a learning organization. We learn from  
20 each review. We capture these lessons learned and  
21 communicate them to the stakeholders through an ISG.  
22 The ISG gives the stakeholders a means to raise issues  
23 related to the license renewal guidance documents and  
24 to be sure that they address and, if warranted, result  
25 in an ISG being issued.

**NEAL R. GROSS**

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

1           The ISG process includes identification,  
2           development, and implementation. Implementation of  
3           the ISG includes current and future applicant and  
4           addresses evaluating licensees that hold renewed  
5           licenses. For each approved ISG the staff believes  
6           involves compliance with the regulation, the staff  
7           will track the licensees to which it applies and  
8           ensure that they're evaluated in accordance with  
9           existing staff guidance prior to entering the period  
10          of extended operation.

11           This slide, which is not a reading test  
12          for anyone, but, hopefully, your handouts give a  
13          better view of it. This slide provides the overview  
14          of the ISG process. The staff, industry are  
15          interested stakeholders and may propose changes to the  
16          information provided in the LIG document. The ISG  
17          coordinator will screen the changes and determine if  
18          development of an ISG is warranted.

19           If it is, then the appropriate technical  
20          staff will review the change, and a proposed ISG would  
21          be issued for stakeholder comments. If the  
22          stakeholders agree, then the ISG will be published on  
23          the NRC web sites, and applicants may reference it in  
24          their license renewal applications. If the  
25          stakeholders do not agree, then they'll provide

**NEAL R. GROSS**

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

1 written comments, and the staff will hold a public  
2 meeting to address these comments. At that point, we  
3 would resolve the ISG and publish it on our web site.

4 The process also has a management review  
5 process involved in it, which, for an approved ISG, if  
6 an applicant or other stakeholder does not agree with  
7 the staff position, they may request further  
8 management review of the position. But even while  
9 it's under review, it's still an approved staff  
10 position and must be addressed.

11 Next slide, please. On development of the  
12 ISG, there are two types of ISG's: clarification ISG's  
13 and compliance ISG's. Clarification ISG's provide  
14 additional guidance to applicants that will reduce  
15 requests for additional information. Clarification  
16 ISG's do not create new staff positions that have not  
17 been addressed by previous applicants. Clarification  
18 ISG's can inform applicants that more information is  
19 needed on an issue already addressed in the license  
20 renewal guidance documents.

21 Clarification ISG's do not involve  
22 compliance with the regulation, therefore, do not  
23 involve back-fit consideration. Complacent ISG, on  
24 the other hand, do involve compliance with the  
25 regulations and are required to be signed out with a

**NEAL R. GROSS**

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

1 documented evaluation.

2 Implementation for applicants, current and  
3 future applicants must address all approved ISG's  
4 before a renewed license is issued. Applicants may  
5 wish to address an ISG before it is approved. Why?  
6 Because if it's approved before their license is  
7 renewed, then they will have to address it, possibly,  
8 at the last minute. And, also, if they address it  
9 during the review, then they will not have to address  
10 it in back-fit space.

11 Now, implementation for licensees holding  
12 a renewed license, the staff will track approved ISG's  
13 involve compliance with the regulations for licensees  
14 that hold a renewed license. Staff will prepare a  
15 back-fit package for licensees holding the renewed  
16 license in accordance with existing staff guidance and  
17 will present it to the committee to review generic  
18 requirements for the committee's evaluation.

19 And when will we complete the evaluation?  
20 We'll do that prior to the period of extended  
21 operations because these ISG's involve issues that  
22 deal with the period of extended operation. However,  
23 we won't normally wait until then. Normally, this  
24 will be done when the license renewal guidance  
25 documents are updated. And as I said before, we will

**NEAL R. GROSS**

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

1 maintain a list of all the ISG's that involve  
2 compliance and the licensees that have not yet  
3 addressed those.

4 Next slide. ACRS involvement. The staff  
5 is always available to brief on any of these issues.  
6 And there are two ACRS meetings for each license  
7 renewal application. The applicable ISG's are  
8 addressed and discussed at these meetings, and we also  
9 brief ACRS when the guidance documents are updated to  
10 include the ISG's.

11 Next slide, please. This slide and the  
12 next one are a status of the ISG's. There are 14  
13 ISG's. The first five have been completed, and are on  
14 the NRC's web site, and current applicants are  
15 addressing them. Two are no longer ISG's because they  
16 do not involve technical information. These are ISG-8  
17 and ISG-10. ISG-8 is the ISG process, which we are  
18 discussing today; and ISG-10 is the standard license  
19 renewal format, which provides guidance to the  
20 applicants for the license renewal applications based  
21 on lessons learned from reviews of applications using  
22 the new GALL format.

23 MEMBER WALLIS: So number six will be very  
24 useful. The housing effect of components, that seems  
25 to be a debatable issue on all these applications.

**NEAL R. GROSS**

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

1 MR. CUSHING: Right. And the treatment of  
2 active components and housings, that's under  
3 development. I'm not exactly sure the date it will be  
4 issued.

5 CHAIRMAN BONACA: What is the seismic II  
6 over I?

7 MR. CUSHING: Seismic II over I is the  
8 effects of the seismic Class II piping, the failure  
9 and the effects it would have on the seismic Class I.

10 CHAIRMAN BONACA: But where is it?

11 MR. CUSHING: Excuse me? Where is it?

12 MR. LIAM: This is Sam Liam. It's number  
13 nine.

14 MR. CUSHING: Number nine.

15 MR. LIAM: It's under the second scoping

16 --

17 CHAIRMAN BONACA: I see, okay. I  
18 understand. So this is a general criteria.

19 MR. KUO: It's broader than just a  
20 seismic.

21 CHAIRMAN BONACA: Yes.

22 MR. LIAM: And also Dr. Wallis' question  
23 about where's the housing. The proposed ISG on  
24 housing is in concurrence right now.

25 MR. CUSHING: And, as part of the license

1 renewal format, we've requested the applicants to  
2 address, the ISG's that they have addressed we ask  
3 them to break that out separately so that it will be  
4 apparent to everybody reviewing it that they have  
5 addressed those ISG's. Any other questions on the  
6 status?

7 MEMBER WALLIS: For the interim guidance,  
8 when do they ever become real guidance?

9 MR. CUSHING: Well, they are real guidance  
10 once they're approved.

11 MEMBER WALLIS: Yes, the interim isn't  
12 really a functional word, is it?

13 MR. CUSHING: Well, interim is interim  
14 because it's between revisions to the license renewal  
15 guidance documents. That's how it gets the interim.  
16 It can be misleading, and that doesn't seem like it's  
17 final guidance, but once we approve it, it is final  
18 guidance. Once it goes into the revisions of the SRP,  
19 we wouldn't be tracking them as ISG's. They'd be part  
20 of the guidance documents.

21 MEMBER ROSEN: The later you make these  
22 ISG's in this process and the more of them there are  
23 creates a huge bow wave for the CRGR, does it not?

24 MR. CUSHING: Yes. Not all of the ISG's  
25 are compliance ISG's, so for the ones that do involve

**NEAL R. GROSS**

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

1 compliance, then, yes, they will have to address them.  
2 And the more plants that get renewed licenses, the  
3 same issue would have to be addressed, but it would  
4 probably be the same issue for all the plants that  
5 would have renewed license.

6 Summary? All right. The ISG process  
7 captures the lessons learned from each review,  
8 communicates it to the staff, the applicants and other  
9 stakeholders in a timely manner. The process provides  
10 an open means for all stakeholders, staff, industry,  
11 and public to raise a concern and provide input on the  
12 license renewal guidance documents.

13 This process ensures that the input will  
14 be evaluated, tracked, and, if warranted, implemented.  
15 It provides a mean for the staff to keeps its guidance  
16 current and assist the staff when the guidance  
17 documents are updated. It also ensures that  
18 facilities with renewed license are evaluated for any  
19 ISG that involves compliance with the regulations. We  
20 feel that our license renewal guidance documents are  
21 living documents, and this process will help keep them  
22 current on a real time basis.

23 CHAIRMAN BONACA: So how do you address  
24 the issue of back-fitting? You have to give back-fit  
25 analyses, I imagine.

**NEAL R. GROSS**

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

1 MR. CUSHING: Right. It would be a  
2 compliance exception to the back-fit rule, and it  
3 would be taken, we have existing guidance for  
4 compliance. We would follow that process, like we  
5 would for any other compliance.

6 MEMBER ROSEN: It would be a cost benefit  
7 evaluation?

8 MR. CUSHING: For compliance, there's no  
9 cost benefit. It's just to comply with the  
10 regulations, and you have to do a documented  
11 evaluation to document the regulation. The station  
12 blackout would be one of them.

13 MR. DUDLEY: And this back-fit would have  
14 to go through CRGR review before it's implemented on  
15 operating plants.

16 MEMBER ROSEN: But the contentious back-  
17 fits are the ones that are cost-benefit back-fits,  
18 which this would not be. It would be simply a matter  
19 of demonstrating that the compliance needs to be  
20 achieved.

21 MR. CUSHING: Exactly, just demonstrating  
22 it, which we do when we issue our ISG's. When we  
23 believe they involve compliance, we have a documented  
24 evaluation performed before we issue it and  
25 demonstrating the regulation and the compliance

**NEAL R. GROSS**

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

1 aspect.

2 CHAIRMAN BONACA: Because, anyway, no  
3 plant that has received a renewed license has yet to  
4 go on into the period of extended operation. So it's  
5 more like committing to some additional items.

6 MR. CUSHING: That's correct. And I  
7 believe that's the end of our presentation.

8 MR. DUDLEY: That's the end of our  
9 presentation. I hope I've been brief enough. Is it  
10 too early to request directions on what information  
11 you'd like presented at the September ACRS meeting?

12 MEMBER ROSEN: Yes, it is because we have  
13 to go through the subcommittee discussion on what we  
14 heard.

15 CHAIRMAN BONACA: Why don't we go around  
16 the table and starting with you, Graham.

17 MEMBER WALLIS: I don't really have any  
18 issues. It just looks like one of these license  
19 renewals that's becoming more and more routine.

20 MEMBER ROSEN: Yes, I have three matters  
21 that remain on my list. We heard from Mr. Galletti a  
22 hint, I would call it, that some licensees' renewal  
23 activities may not have been conducted in accordance  
24 with Appendix B. Now, this doesn't apply to St.  
25 Lucie. The way we heard it was, unlike St. Lucie,

**NEAL R. GROSS**

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

1 which has done all of its stuff in accordance with  
2 Appendix B, some prior license renewal applicants may  
3 not have done it that way. And that was troubling,  
4 and I would really like some feedback on that.

5 MR. KUO: I've been thinking about it. I  
6 may be wrong, I have to check with our legal staff,  
7 but this is my personal view now. When they prepared  
8 the application, this is under Part 54, and Part 54  
9 does not have the requirement yet to say that you are  
10 to prepare your application in accordance with  
11 Appendix B. See, Appendix B only applies to Part 50  
12 plants.

13 MEMBER ROSEN: Appendix B applies to Part  
14 50, not to Part 54.

15 MR. KUO: Right. And Part 54, especially  
16 the application preparation, they are not -

17 MEMBER ROSEN: This is a very fine  
18 distinction to me. I know it's not a fine distinction  
19 to the OGC or to most NRC staffers, but the intent of  
20 Appendix B was to assure that safety-related  
21 activities conducted in accordance, and, certainly  
22 renewing a license for 20 more years is an important  
23 safety-related activity. So, to me, it should be  
24 required. If it isn't, that's a problem. But, to me,  
25 it should be. So I leave that question on the table.

**NEAL R. GROSS**

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

1 I don't want to go into it anymore here. It's just a  
2 very puzzling outcome, assuming what Mr. Galletti said  
3 is true, that some licensees did not conduct their  
4 license renewal activity in accordance with approved  
5 procedures and instructions, then I am puzzled and  
6 leave it that way.

7 The second point I think falls out of this  
8 is the need, again, not a St. Lucie-specific problem  
9 but a problem that may include St. Lucie, is the  
10 question of cable manhole inspection programs where  
11 there doesn't seem to be an adequate coverage of this  
12 issue in either the GALL report or in the ISG's, and  
13 I think I heard someone say that there was some idea  
14 that GALL would be augmented to cover it in the  
15 future. And I think that's important because we keep  
16 coming back to the same problem over and over again.  
17 The cable manholes fill up with water, and the  
18 programs to ensure that that doesn't happen are not  
19 uniformly successful.

20 And the third one that I have here is I'm  
21 not convinced that looking for interior leakage in  
22 below-grade concrete in plants that have aggressive  
23 ground water environment or looking at exterior walls  
24 of structure when they're excavated provides adequate  
25 assurance of the functionality of these important

**NEAL R. GROSS**

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

1 structures. I think something better is needed. I  
2 don't know what it is. I think maybe it's a research  
3 issue, maybe it's something license renewal could  
4 bring to research. Just a suggestion, but I think  
5 it's not adequate to say, well, if it leaks, we'll  
6 find it because we'll look inside, and if we ever  
7 happen to take down, we'll have a look at the outside.

8           Given the importance of safety-related  
9 structures over a 60-year life in aggressive  
10 environments, it is simply not adequate, in my view,  
11 to have that posture and to encourage the staff to  
12 have more stringent requirements.

13           MR. KUO: Well, Dr. Rosen, certainly, this  
14 is a good suggestion, and you recognize that this is  
15 really a generic issue. I don't think you meant to  
16 apply this to St. Lucie only.

17           MEMBER ROSEN: Not only St. Lucie but many  
18 safety-related concrete structures that are in  
19 aggressive environments ought to have more assurance.  
20 Licensees ought to provide more assurance of their  
21 continued functionality than simply saying we'll see  
22 it if it leaks.

23           MR. KUO: We will take a look at it and  
24 see if we could pass this issue to research.

25           CHAIRMAN BONACA: Before we move on to the

**NEAL R. GROSS**

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

1 other side, I think we need to understand more  
2 specifically what was presented here because my  
3 understanding is that the activities of scoping, for  
4 example, may not have been conducted under Appendix B.  
5 Because, I mean, the programs are the same.

6 MR. KUO: But when they prepared the  
7 application, they are not of the requirement of using  
8 Appendix B.

9 MEMBER ROSEN: You see, I'm not satisfied,  
10 I don't think, with that. I understand the  
11 implementation of the activities will be under  
12 Appendix B because they're in a Part 50 facility. But  
13 if one made mistakes that could have been avoided by  
14 an Appendix B program on the processes and  
15 documentation, then I think that the assurance that  
16 the agency and the public should have that this  
17 process was robust.

18 CHAIRMAN BONACA: When you do scoping, the  
19 applicant identifies all the documentation that  
20 they're using. The question is what is scoping under  
21 Appendix B means different from what they're already  
22 doing. That's the evaluation that you can make of the  
23 issue. At least we can understand the significance of  
24 the issue.

25 MEMBER ROSEN: I think this may be a fine

**NEAL R. GROSS**

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

1 point.

2 MR. KUO: And that's a review we do when  
3 we go out to do the scoping methodology review.  
4 That's the methodology we are reviewing, and whether  
5 they really follow the methodology, then the  
6 inspection is going to verify that. And plus, there's  
7 another aspect that I want to emphasize. The  
8 application is submitted and the oath and the  
9 affirmation, so whatever the information there, they  
10 ought to be true, to their knowledge.

11 MR. GALLETTI: If I could just say one  
12 thing. This is Mr. Galletti again. The idea that,  
13 certainly, the applications, the implementing guidance  
14 was not written under their formal Appendix B process,  
15 again, that's been my experience. However, I heard  
16 the comment that that somehow was related to it not  
17 being reviewed and approved, and I want to make that  
18 clear that, in fact, in the cases that I personally  
19 looked at where we have gone out and looked at the  
20 implementing guidance, even those cases where it was  
21 not under their formal Appendix B program, there was  
22 quite a bit of review and approval of those  
23 guidelines.

24 MEMBER ROSEN: Thank you for that  
25 clarification. That's helpful. And so the distance

**NEAL R. GROSS**

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

1 between full Appendix B and what was actually done  
2 continues to narrow.

3 MR. GALLETTI: It really is more of a  
4 pedigree than an implementation quality issue, as far  
5 as, you know, my own personal experience has been.

6 CHAIRMAN BONACA: I think this is a good  
7 point that was raised, and I want to reflect on that.

8 MEMBER LEITCH: No, I have no residual  
9 questions on what we heard today. I do have a couple  
10 of points of emphasis for the full committee meeting,  
11 but are we going to go around again and talk about  
12 those?

13 CHAIRMAN BONACA: You can just bring it up  
14 now.

15 MEMBER LEITCH: Okay. I thought today we  
16 might hear a little more about the, I guess it's a  
17 TLAA associated with the core support barrel repair.  
18 I didn't hear too much about that, and I'd like to  
19 hear a little more about that at the --

20 MR. KUO: Well, Mr. Hartzman was here.

21 MEMBER ROSEN: Yes, I waved him off,  
22 Graham. I thought I was the only one who was  
23 interested in that, and then I had failed to read all  
24 the material that was in the SER on it. When I read  
25 it, I was comfortable, but he was here.

**NEAL R. GROSS**

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

1 MEMBER LEITCH: Yes, okay. I missed that  
2 point. I heard you waving him off something, but I  
3 didn't know that that was the issue, or I would have  
4 unwaved him off.

5 MR. KUO: Mr. Hartzman was here, and he  
6 was prepared to give some brief --

7 MR. DUDLEY: I will just tell him not to  
8 do away with his notes because we'll pick it up in  
9 September.

10 MEMBER LEITCH: I think it would be good  
11 to hear a little bit. Obviously, at the September  
12 meeting, our time is more limited. I think it can be  
13 very concise. And as you say, it is treated rather  
14 completely in the documents that we have, but I would  
15 just like to hear a little bit about it.

16 MR. KUO: Okay. We will do that in the  
17 full committee meeting.

18 MEMBER LEITCH: Thank you. And I'm sorry  
19 I didn't -- I think one of the other things, and I  
20 think this is primarily for the applicant, is I would  
21 like to hear a little more in the full committee  
22 meeting about the follow-on process. That is, how  
23 you're going to continue to maintain and to monitor  
24 these commitments? What kind of an organization do  
25 you have in place? In other words, is there someone

**NEAL R. GROSS**

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

1 that's going to be permanently at the site who's  
2 responsible for tracking these commitments, seeing  
3 that this whole thing goes forward? I guess one of  
4 the things that we're really concerned about is we're  
5 committing to actions here, some of which will be 10,  
6 15, as much as 20 years away, and how is this going to  
7 be tracked? Supposed plant modifications are made in  
8 the interim, and are those modifications going to be  
9 somehow reviewed for what license renewal implications  
10 there may be associated with them? I guess that's  
11 really the essence of it is just how this thing goes  
12 forward from here. I think that's an appropriate  
13 thing to deal with at the full committee meeting.  
14 That's all I have.

15 CHAIRMAN BONACA: Thank you. Peter?

16 MEMBER FORD: Okay. I have no comments  
17 specific to St. Lucie. I enjoyed reading the SER and  
18 the LRA. As far as the aging management programs and  
19 the TLAA's, I've got three generic problems. The  
20 first is that GALL is taken as one of the approved  
21 procedures for the aging management processes. I  
22 think there's an urgent need for GALL needs to be  
23 updated. For instance, as I look down the aging  
24 management programs for various phenomena, alloy 600,  
25 for instance, and boric acid corrosion, it doesn't

**NEAL R. GROSS**

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

1 take into account some logistic effects. Davis Besse  
2 is an ideal example of that, where one program impacts  
3 on another, and that is not clear in the GALL report,  
4 and it can have an impact on people's decisions.

5 The second one is that it's apparent that  
6 all procedures which have been approved continue to be  
7 approved even though may not be correct. An example  
8 in this particular issue is the alloy 600 repair for  
9 pressurizers, which is looked upon as a TLAA and the  
10 applied fatigue analyses. Whereas, in fact, the  
11 phenomena that's giving rise to the failure may well  
12 be related to fatigue, but, in fact, it is primarily  
13 a stress corrosion cracking. In other words, it's the  
14 syllogism between stress corrosion cracking and  
15 fatigue, which does not take into account the original  
16 procedures, which were approved back in the 1990's,  
17 and that is to be looked upon.

18 And the third one, which is rather more  
19 important, I think, is the quantification of decision  
20 processes for one time or random inspections. This  
21 has come up quite a few times. This one here had a  
22 lot of impact on the concrete aspect, and I echo  
23 Steve's concerns on that, but, also, the galvanic  
24 corrosion, the fire protection systems. The decision-  
25 making process as to when and where you do these

**NEAL R. GROSS**

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

1 inspections is somewhat random. It's almost like  
2 engineering judgment. Some science can be applied to  
3 these, and so we need to look at the validity of the  
4 various degradation algorithms are used to make these  
5 decisions.

6 But those are my three generic --

7 CHAIRMAN BONACA: -- the one-time  
8 inspection, so you would like to know more  
9 specifically when they're going to be --

10 MEMBER FORD: Well, what is the decision  
11 process by which people decide on when you're going to  
12 inspect and where you're going to inspect. It cannot  
13 just be random. I recognize that sometimes it is  
14 random.

15 CHAIRMAN BONACA: This has been always  
16 presented as prior, but there is some latitude there  
17 that has been left. The only application was in the  
18 five years before we get into license renewal.

19 MEMBER FORD: But very, very rarely is  
20 degradation a linear process in time. Unfortunately,  
21 it's mostly expediential. So you've got to have some  
22 rationale as to when and where you're going to  
23 inspect. Those are my three main --

24 CHAIRMAN BONACA: Now, so far as the  
25 presentation of the full committee, any specific area

**NEAL R. GROSS**

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

1 we'll emphasize over other?

2 MEMBER ROSEN: We've heard one, just the  
3 core barrel repair.

4 CHAIRMAN BONACA: Yes, the core barrel.  
5 Yes, we already got that, but that's the one we got  
6 from Graham. I wanted to know from --

7 MEMBER FORD: I'd love to hear more about  
8 the concrete, and I recognize it's not specific to St.  
9 Lucie, but, on the other hand, St. Lucie is a sea-born  
10 station, and it does impact a bit more. I'd love to  
11 hear a little bit more of the rationale behind how  
12 they're going to perform the inspection.

13 MEMBER ROSEN: Yes, and I would like to  
14 second that and say I don't want to hear the recount  
15 of what they've already told us, although it may be  
16 useful for the other members. What have you been able  
17 to do between April the 9<sup>th</sup> and September, in terms of  
18 thinking about and looking into the ability of  
19 technology to help with this problem? Are there some  
20 technological capabilities that could be brought to  
21 bear to provide better assurance that some grade  
22 concrete in aggressive environments retains its  
23 functional integrity?

24 CHAIRMAN BONACA: Yes, I would expand it,  
25 actually, to say, you know, what gives you the

**NEAL R. GROSS**

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

1 confidence for coming and approving what is being  
2 done, which is not much? What is the technical basis  
3 for accepting these programs for testing or whatever?  
4 So I think that's an appropriate question, and I think  
5 it would be valuable to have some information in  
6 regard.

7 Now, you may also want to address the  
8 issue of how the foundations were, you know, the  
9 testing was done during construction. I mean, if  
10 there was a very high confidence regarding the  
11 permeability or lack of permeability of the structures  
12 because of various established processes, then, you  
13 know, well, we'll have more confidence.

14 MR. KUO: It looks like we need to address  
15 it from the beginning.

16 MEMBER ROSEN: But let me focus you, so  
17 you don't waste a lot of time. We understand, I  
18 understand that very high-grade concrete has been used  
19 in the construction, at least at St. Lucie, and all  
20 those things have been done in accordance with the ACI  
21 codes and the rest, and that there is a reasonable  
22 assurance that the concrete was actually placed in  
23 accordance with those designs.

24 What I would like to know is is there a  
25 method, having done all that, to now go back and look

**NEAL R. GROSS**

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

1 after 20 years of performance, look after 30 years of  
2 performance, look after 40 years in a way that's  
3 fairly comprehensive and continues to provide the  
4 assurance that the concrete is performing as it was  
5 expected to.

6 MR. KUO: If I could use my word to  
7 verify.

8 MEMBER ROSEN: To verify, yes. Trust but  
9 verify.

10 MR. KUO: So I will take this back to our  
11 staff, and we will do some thinking. We will come  
12 back to the committee.

13 CHAIRMAN BONACA: Okay. I have still to  
14 make my comments, and that's I don't have anything new  
15 in respect to others raised regarding residual  
16 questions. I think it was a thorough presentation. I  
17 was very pleased coming here that all the open issues  
18 are closed. That's encouraging to me. It means that,  
19 you know, there is merging of the industry with the  
20 staff. And realizing that in the scope of the license  
21 renewal effort, the open items probably represent all  
22 the commitments. So that shows, I think, that we're  
23 converging there. This committee is looking for how  
24 the whole process is converging in the industry to the  
25 point where it will become, you know, more routine

**NEAL R. GROSS**

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

1 and, in a sense, more effective, too. So that was  
2 very good.

3 I also feel that the experience of Turkey  
4 Point clearly helped quite a bit, and that's a good  
5 one. I second the opinions of the other members  
6 regarding what we need to bring about. When you talk  
7 about the concrete issue, certainly, you want to  
8 present that the information regarding phosphates,  
9 that's going to be very interesting to Dana Powers,  
10 and, probably, he will want to have that information  
11 even before then.

12 When you do the presentation to us in  
13 September, I would tend not to spend too much time on  
14 the process of scoping because we already know pretty  
15 well how that goes. More on the results of that, some  
16 of the, you know, unique issues that you have seen  
17 with a particular focus on operating experience.  
18 Clearly, the core barrel, it's an example, but there  
19 are other examples there where operating experience  
20 has led you to certain actions. And clearly, they're  
21 different, potentially, from other plants we have  
22 seen, and those will be of us interest to us.

23 And finally, clearly, the TLAA's are  
24 important. This plant has significant margin, and I  
25 think it's important to communicate that to the

**NEAL R. GROSS**

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

1 committee; they will be interested in that.

2 With that, I don't have any other  
3 comments. I want to thank you for a very well-informed  
4 presentation and apologize for the short time we had,  
5 but we had another meeting.

6 MR. KUO: If I may just make a couple  
7 comments. Dr. Ford mentioned about update GALL. Yes,  
8 indeed, we are committed to do that, and our goal is  
9 that we will complete a revision of GALL in the later  
10 part of 2004, next year.

11 And also, the industry's cooperation with  
12 us, they have taken an effort to update their NEI  
13 guideline 9510. We were told in the last meeting we  
14 had with them that they are shooting for July or  
15 August of this year to complete the revision of their  
16 9510. Right now, it's revision three. So we can  
17 review it and comment on that we will work with the  
18 industry so that we can also use the Reg Guides to  
19 endorse to their guideline.

20 I was just given a memo written on March  
21 the 7<sup>th</sup> from Jose Calvo, the chief of Electrical  
22 Instrumentation and Control Branch to executive  
23 director of HRS, John Larkins, on the close-out of a  
24 generic issue 168, qualification of a low-voltage  
25 instrumentation and cables. And in this memo, it

**NEAL R. GROSS**

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

1 transmits an NRC regulatory issue summary on the  
2 subject. So you probably haven't seen it yet.

3 MEMBER LEITCH: No, we haven't, at least  
4 I haven't.

5 MR. KUO: And that's all I have.

6 CHAIRMAN BONACA: Okay. One last note,  
7 during the presentation in September, you said you  
8 want to also review this Interim Staff Guidance. I  
9 would suggest that if you just present in a table the  
10 examples, you can speak from it. It shows how some of  
11 the issues that this committee has seen before are to  
12 guidance documents. That's good. The half-nozzle  
13 repair, it would lead us to something good.

14 With that, are there any other questions  
15 or comments from members, members of the public?  
16 None. This meeting is adjourned.

17 (Whereupon, the foregoing matter was  
18 concluded at 3:22 p.m.)

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: Advisory Committee on  
Reactor Safeguards  
Plant License Renewal  
Subcommittee Meeting

Docket Number: n/a

Location: Rockville, MD

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.



---

Matt Needham  
Official Reporter  
Neal R. Gross & Co., Inc.

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
 PLANT LICENSE RENEWAL SUBCOMMITTEE MEETING  
 ST. LUCIE UNITS, 1 & 2  
 APRIL 9, 2003, ROCKVILLE, MARYLAND

Contact: Tim Kobetz (301-415-8716, tj1@nrc.gov )

-PROPOSED SCHEDULE-

| Topics  | Presenters   | Time                    |
|---|--|-------------------------|
| I. Opening Remarks  | M. Bonaca, ACRS  | 8:30-8:35 a.m.          |
| II. Staff Introduction  | P. T. Kuo, NRR   | 8:35-8:45 a.m.          |
| III. Florida Power and Light, Presentation  | S. Hale  | 8:45-9:30 a.m.          |
| A. Background   |  |                         |
| B. License Renewal Application Scoping and Screening Process  |  |                         |
| C. Aging Effects  |  |                         |
| D. Aging Management Programs  |  |                         |
| E. Time Limited Aging Analyses  |  |                         |
| IV. Overview and Status of Open Items Related to License Renewal of St. Lucie Units 1 & 2 SER (including ROP and recent events, if applicable). | N. Dudley<br>J. Medoff<br>D. Nguyen<br>J. Fair<br>S. Sheng | 9:30-10:15 a.m.         |
| <b>BREAK</b>  |  | <b>10:15-10:30 a.m.</b> |
| V. SER Chap. 2: Scoping and Screening Methodology and Results, and aging management reviews   | G. Galletti<br>N. Dudley                                   | 10:30-11:30 noon        |
| <b>LUNCH</b>  |  | <b>11:30-12:30 p.m.</b> |
| VI. Aging Management Program Inspections and Concrete Aging Issues  | N. Dudley<br>C. Julian<br>D. Jeng                          | 12:30-1:00 p.m.         |
| VII. SER Chap. 3: Aging Management Programs   |  | 1:00-1:30 p.m.          |
| <b>BREAK</b>  |  | <b>1:30-1:45 p.m.</b>   |
| VIII. SER Chap. 4: Time Limited Aging Analyses  |  |                         |
| A. Overview   | N. Dudley  | 1:45-2:15 p.m.          |
| B. Reactor Vessel Neutron Embrittlement   |  |                         |
| C. Thermal Fatigue  |  |                         |
| D. Leak-before-break  |  |                         |
| IX. Interim Staff Guidance: Process and Status  | J. Cushing   | 2:15-3:00 p.m.          |
| X. Subcommittee Discussion  |  | 3:00-3:15 p.m.          |
| XI. Adjourn   |  | 3:15 p.m.               |

**NOTE:**

- Presentation time should not exceed 50 percent of the total time allocated for specific item. The remaining 50 percent of the time is reserved for discussion.
- 25 copies of the presentation materials to be provided to the Subcommittee



# LICENSE RENEWAL

---

**ST. LUCIE PLANT**

**ACRS  
SUBCOMMITTEE MEETING**

**April 9, 2003**



# Agenda

---

- Background
- Scoping/Screening Process
- Aging Management Reviews
  - Concrete Below Groundwater
- Aging Management Programs
- Time Limited Aging Analyses
- Conclusions



# Background

---

- Strategic planning for license renewal of FPL nuclear plants began in 1992
- FPL active in license renewal industry groups since 1993
- Turkey Point License Renewal Application (LRA) submitted in September 2000
- Integrated Plant Assessment (IPA) and Time Limited Aging Analyses (TLAAs) efforts for St. Lucie Units 1 and 2 initiated in Fall of 2000



# Background

---

- St. Lucie License Renewal Application (LRA) submitted in November 2001
- Received renewed licenses for Turkey Point Units 3 and 4 on June 6, 2002



# Background

---

- Safety Review Requirements and Guidance
  - 10 CFR Part 54-License Renewal Rule
  - Standard Review Plan for License Renewal
  - GALL Report
  - Regulatory Guide DG-1047
  - NRC position letters on generic issues
  - NEI 95-10



# Background

---

- IPA/TLAA Technical Work Description
  - Initial procedures piloted in 1996
  - Procedures based on making the best use of existing design references and tools
  - Information trips made to other applicants
  - In-depth review of another applicant's technical documents performed by core team



# Background

---

- **IPA/TLAA Technical Work Description (cont.)**
  - Results of NRC review of the Turkey Point license renewal application, lessons learned from NRC review of other applications, RAIs and RAI responses, and resolution to generic issues factored into procedures and output documents, as appropriate and available
  - Technical work performed in accordance with the FPL Quality Assurance Program



# Background

---

- Application Format
  - Same as Turkey Point
  - Chapter 1 - Administrative Information
  - Chapter 2 - SCs Subject to AMR  
(Scoping/Screening)
  - Chapter 3 - Aging Management Reviews (AMRs)
  - Chapter 4 - Time Limited Aging Analyses  
(TLAAs)



# Background

---

- Application Format (cont.)
  - Appendix A - UFSAR Supplement
  - Appendix B - Aging Management Programs (AMPs)
  - Appendix C - AMR Process for Non Class 1 Components
  - Appendix D - Technical Specification Changes
  - Environmental Report - Operating License Renewal Stage



# Background

---

- Source Documents
  - UFSAR and Technical Specifications
  - Licensing Correspondence
  - Design Basis Documents
  - Component Database
  - Drawings
  - Other



# Scoping and Screening Process

---

- Scoping and Screening Methodology
  - Described in Section 2.1
  - Methodology used for St. Lucie the same as that used for Turkey Point
  - Follows the approach recommended in NEI 95-10



# Scoping and Screening Process

---

- Scoping
  - Purpose - To identify Systems and Structures within the scope of License Renewal
  - Scoping Criteria - Systems and Structures which are:
    - Safety Related
    - Non-Safety Related which can Affect Safety Related
    - Systems and Structures relied on to demonstrate compliance with Fire Protection, Environmental Qualification, Pressurized Thermal Shock, Anticipated Transients without Scram, and Station Blackout



# Scoping and Screening Process

---

- Scoping - Safety Related
  - Safety Related definitions in FPL procedures the same as 10 CFR Part 54
  - Used UFSAR, Technical Specifications, licensing correspondence, Design Basis Documents (DBDs), Component Database, and design drawings
  - All systems and structures were reviewed for SR components and structural components



# Scoping and Screening Process

---

- Scoping - Non Safety which can affect Safety Related
  - Used UFSAR, Technical Specifications, licensing correspondence, DBDs, Component Database, design drawings, and pipe stress analyses
  - Two categories
    - Provides functional support
    - Potential for interactions



# Scoping and Screening Process

---

- Scoping - Regulated Events
  - Used UFSAR, Technical Specifications, licensing correspondence, DBDs, Component Database, design drawings
  - Also used Appendix R Safe Shutdown Analysis and Essential Equipment List, EQ List in the Component Database, and Station Blackout Load List



# Scoping and Screening Process

---

- Scoping Results presented in Section 2.2
  - 39 of 70 Systems in Scope
  - 16 of 46 Structures in Scope
  - Plant layout figures included for location of plant structures



# Scoping and Screening Process

---

- Screening
  - Purpose - To identify Structures and Components (SCs) which require an Aging Management Review
  - Screening Criteria - SCs which:
    - Support License Renewal System Intended Functions (component level scoping)
    - Perform the intended functions without moving parts or without a change in configuration or properties (passive)
    - Are not subject to replacement based on a qualified life or specified time period (long-lived)



# Scoping and Screening Process

---

- Mechanical System Screening
  - Evaluation boundaries and interfaces are established
  - SCs that are included within a system's evaluation boundaries are identified
  - SCs that support system intended functions are identified
  - SCs that are passive are identified
  - SCs that are long-lived are identified
  - Component Intended Functions for SCs requiring an Aging Management Review are identified



# Scoping and Screening Process

---

- Civil/Structural Screening
  - SCs for each structure are identified
  - SCs identified include non-current carrying electrical and I&C components
  - SCs that support each of the structure intended functions are identified
  - SCs that are passive are identified
  - SCs that are long-lived are identified
  - Component Intended Functions for SCs requiring an Aging Management Review are identified



# Scoping and Screening Process

---

- Electrical/I&C Screening
  - Component commodity groups are identified
  - Descriptions and functions for each component commodity group are identified
  - Component commodity groups that are passive are identified
  - Component commodity groups that are long-lived are identified
    - Component commodity groups covered by 10 CFR 50.49 EQ Program are considered to be subject to replacement based on qualified life



# Scoping and Screening Process

---

- Screening Results
  - Summarized in Chapter 2 and presented in 6 column tables in Chapter 3
    - Mechanical Sections
      - RCS and Connected Systems
      - ESF Systems
      - Auxiliary Systems
      - Steam and Power Conversion
    - Structures and Structural Components Sections
    - Electrical and I&C Section
  - License Renewal Boundary Drawings and UFSAR references provided



# Aging Management Reviews

---

- Purpose- For each SC requiring an Aging Management Review (AMR), demonstrate that the effects of aging will be adequately managed so that the intended functions will be maintained consistent with the Current Licensing Basis for the extended period of operation



# Aging Management Reviews

---

- Aging effects requiring management established based on review of engineering inputs
  - AMR technical resources
  - AMR operating experience reviews
- Methodology for determining aging effects requiring management for non-Class 1 civil/mechanical SSCs in LRA Appendix C



# Aging Management Reviews

---

- AMR Technical Resources
  - WOG Generic Technical Reports (15 total)
  - NUMARC License Renewal Industry Reports
  - EPRI Tools (both Mechanical and Civil/Structural)  
Derived from B&W Tools
  - Turkey Point Aging Management Reviews
  - GALL Report
  - Materials handbooks and in-house materials expertise
  - Participation in industry groups



# Aging Management Reviews

---

- AMR Operating Experience Reviews
  - Reviewed applicable INPO and NRC generic communications and FPL responses
  - Extensive review of plant specific history including:
    - Non-Conformance and Condition Reports
    - Event Response Team and Licensee Event Reports
    - FPL Metallurgical Laboratory Reports
    - Interviews with component/system engineers and plant walk-downs
  - Used as input for identification of aging effects
  - Establishes track record for managing aging



# Aging Management Reviews

---

- Application Chapter 3
  - Same groupings as screening
  - Results presented in 6 column tables
  - Technical guidance/criteria for aging effects for non-class 1 components described in Appendix C
  - Electrical design features are the same as Turkey Point (lead sheathed cable, outdoor areas, etc.)



# Aging Management Reviews

---

- GALL Report Comparisons
  - Differences between GALL component/commodity group listings and St. Lucie screening results identified and evaluated
  - Differences in materials and internal and external environments identified
  - GALL Report reference is provided in 6 column tables when the component/commodity group, material, and environment are the same



# Aging Management Reviews

---

---

- GALL Report Comparisons (cont.)
  - Aging management programs consistent with GALL identified



# Aging Management Reviews

---

## 3.2 ENGINEERED SAFETY FEATURES SYSTEMS

The following systems .....

Subsection 2.3.2 provides .....

The aging management review .....

The Engineered Safety Features Systems scoping, screening, and aging management review results were compared to the GALL Report [Reference 3.2-1]. The following component/commodity groups identified in the GALL Report do not require an aging management review for St. Lucie Units 1 and 2 for the reasons noted.

- Containment Spray Heat Exchangers (V A.6) - The St. Lucie Units 1 and 2 design do not contain these components. The St. Lucie designs utilize the shutdown cooling heat exchangers to perform this function.
- Refueling Water Tank Circulation Pumps (V D1.3) - The St. Lucie Units 1 and 2 designs do not contain these components.
- Refueling Water Tank Heating Heat Exchangers (V D1.6) - The St. Lucie Units 1 and 2 designs do not contain these components.
- Primary Containment Heating and Ventilation System Filters (VII F3.4) - The St. Lucie Units 1 and 2 designs do not contain these components.

Additionally, the GALL Report does not address systems/subsystems included in Containment Post Accident Monitoring.



# Aging Management Reviews

---

## 3.2.1 MATERIALS AND ENVIRONMENTS

The Engineered Safety Features Systems are exposed to internal environments of ..... For corresponding component/commodity groups included in the GALL Report, FPL identified the following additional environments at St. Lucie Units 1 and 2:

- Internal environment of treated water - other for Containment Spray valves, thermowells, orifices, and piping and fittings
- Internal environment of raw water - valves, piping, and fittings associated with the reactor cavity sumps (included as part of Containment Spray)
- Internal environment of air/gas for Containment Isolation valves, piping, and fittings
- Internal environment of air/gas for refueling water tanks and safety injection tanks

The tanks, pumps, heat exchangers, piping, tubing, and associated components and commodity groups for these systems are constructed of .... For corresponding component/commodity groups included in the GALL Report, FPL identified the following additional material applications at St. Lucie Units 1 and 2:

- Nickel alloy utilized for piping
- Aluminum and fiberglass reinforced vinyl ester utilized for the Unit 1 refueling water tank
- Brass utilized for valves
- Stainless steel utilized for spray nozzles, bolting, and safety injection tanks



# Aging Management Reviews

TABLE 3.2-4  
SAFETY INJECTION

| Component / Commodity Group [GALL Reference]     | Intended Function                  | Material                               | Environment                               | Aging Effect Requiring Management       | Program/Activity  |
|--|------------------------------------|--|---|---|---|
| <b>Internal Environment</b>                      |                                    |  |   |   |   |
| Safety injection tanks [V D1.7.3]                | Pressure boundary                  | Stainless steel                        | Treated water - borated                   | Loss of material<br>Cracking            | Chemistry Control Program   |
|  |                                    |  | Air/gas                                   | None                                    | None required   |
| Low pressure safety injection pumps [V D1.2.1]   | Pressure boundary                  | Stainless steel                        | Treated water - borated                   | Loss of material<br>Cracking            | Chemistry Control Program   |
| High pressure safety injection pumps [V D1.2.1]  | Pressure boundary                  | Stainless steel                        | Treated water - borated                   | Loss of material <sup>1</sup>           | Chemistry Control Program   |
| Shutdown cooling heat exchanger tubes [V D1.5.2] | Pressure boundary<br>Heat transfer | Stainless steel                        | Treated water - borated (inside diameter) | Loss of material<br>Fouling<br>Cracking | Chemistry Control Program   |
|  |                                    |  | Treated water - other (outside diameter)  | Loss of material<br>Fouling             | Chemistry Control Program   |
| Shutdown cooling heat exchanger tube sheets      | Pressure boundary                  | Carbon steel clad with stainless steel | Treated water - borated                   | Loss of material<br>Cracking            | Chemistry Control Program   |
|  |                                    |  | Treated water - other                     | Loss of material                        | Chemistry Control Program<br>Galvanic Corrosion<br>Susceptibility Inspection<br>Program |



# Aging Management Reviews

TABLE 3.2-4 (continued)  
SAFETY INJECTION

| Component / Commodity Group [GALL Reference]                        | Intended Function | Material        | Environment                  | Aging Effect Requiring Management | Program/Activity                          |
|---|-------------------|-----------------|------------------------------|-----------------------------------|---|
| <b>External Environment</b>   |                   |                 |                              |                                   |   |
| Safety injection tanks  | Pressure boundary | Stainless steel | Containment air              | None                              | None required                             |
| High pressure safety injection pumps                                | Pressure boundary | Stainless steel | Indoor - not air conditioned | None                              | None required                             |
| Low pressure safety injection pumps                                 | Pressure boundary | Stainless steel | Indoor - not air conditioned | None                              | None required                             |
| Shutdown cooling heat exchanger shells [V D1.5 3]                   | Pressure boundary | Carbon steel    | Indoor - not air conditioned | Loss of material                  | Systems and Structures Monitoring Program |
|   |                   |                 | Borated water leaks          | Loss of material                  | Boric Acid Wastage Surveillance Program   |
| Shutdown cooling heat exchanger channel heads and channel covers    | Pressure boundary | Carbon steel    | Indoor - not air conditioned | Loss of material                  | Systems and Structures Monitoring Program |
|   |                   |                 | Borated water leaks          | Loss of material                  | Boric Acid Wastage Surveillance Program   |
| Unit 1 low pressure safety injection pump cooler shells [V D1.5 4]  | Pressure boundary | Cast iron       | Indoor - not air conditioned | Loss of material                  | Systems and Structures Monitoring Program |
|   |                   |                 | Borated water leaks          | Loss of material                  | Boric Acid Wastage Surveillance Program   |
| Unit 1 high pressure safety injection pump cooler shells [V D1.5 4] | Pressure boundary | Cast iron       | Indoor - not air conditioned | Loss of material                  | Systems and Structures Monitoring Program |
|   |                   |                 | Borated water leaks          | Loss of material                  | Boric Acid Wastage Surveillance Program   |
| Unit 2 high pressure safety injection pump cooler shells [V D1.5.3] | Pressure boundary | Carbon steel    | Indoor - not air conditioned | Loss of material                  | Systems and Structures Monitoring Program |
|   |                   |                 | Borated water leaks          | Loss of material                  | Boric Acid Wastage Surveillance Program   |



# Aging Management Reviews

---

## 3.2.1 CONCLUSION

The review of industry information, NRC generic communications, and St. Lucie Units 1 and 2 operating experience identified no additional aging effects beyond those discussed in Subsection 3.2.2. Tables 3.2-1 through 3.2-5 contain the results of the aging management review for the Engineered Safety Features Systems and summarize the aging effects requiring management.

The aging effects requiring management are adequately managed by the following programs:

St. Lucie programs consistent with the corresponding programs in the GALL Report:

- ASME Section XI, Subsections IWB, IWC, and IWD Inservice Inspection Program
- Boric Acid Wastage Surveillance Program
- Chemistry Control Program

St. Lucie plant-specific programs:

- Galvanic Corrosion Susceptibility Inspection Program
- Periodic Surveillance and Preventive Maintenance Program
- Systems and Structures Monitoring Program

Based on the evaluations provided in Appendix B for the programs listed above, aging effects are adequately managed so that the intended functions of the Engineered Safety Features Systems components listed in Tables 3.2-1 through 3.2-5 are maintained consistent with the St. Lucie Units 1 and 2 CLBs for the period of extended operation.



# Aging Management Reviews

---

- Appendix C - Non-Class 1 Component AMR Process
  - Not required by regulation
  - Includes technical discussions regarding SCC, bolting, high cycle fatigue, etc.
  - Addresses various RAIs from previous license renewal reviews and lessons learned from Turkey Point
  - Follows EPRI Tools Methodology adapted to St. Lucie



# Aging Management Reviews

---

---

- Concrete Below Groundwater - ACRS

Questions:

- 1) How do phosphates affect aging of concrete structures?
- 2) How is corrosion of rebar managed?



# Aging Management Reviews

---

## 1) How do phosphates affect aging of Concrete structures?

Technical document review yielded no limits or guidance related to phosphates in soil or groundwater:

- ACI 201.2R Guide to Durable Concrete
- ACI 318 Building Code Requirements for Reinforced Concrete.
- ACI 349.3R Evaluation of Existing Nuclear Safety Related Structures.
- ACI 515.1R - A Guide to the Use of Waterproofing, Dampproofing, Protective, and Decorative Barrier Systems for Concrete (Table 2.5.2 - Effect of Chemicals on Concrete, says 10-85%  $H_3PO_4$  - disintegrates concrete slowly).



# Aging Management Reviews

---

- Documents Reviewed (Cont.)
  - ASME Section III, Division 2, Subsection CC - Code for Concrete Reactor Vessels and Containments
  - ASTM C94 Specification for Ready-Mixed Concrete
  - ASTM C114 Test Methods for Chemical Analysis of Hydraulic Cement
  - ASTM C150 Specification for Portland Cement
  - EPRI TR-103835 PWR Containment Structures License Renewal Industry Report
  - EPRI TR-103842 Class I Structures License Renewal Industry Report
  - EPRI TR-114881 Aging Effects for Structures and Structural Components (Structural Tools)



# Aging Management Reviews

---

---

- Phosphates in soil and groundwater are not detrimental to concrete durability because:
  - Phosphates are not very soluble in water in all ranges of pH (unlike chlorides & sulfates)
  - Soils & groundwater generally contain 500-1000 ppm total phosphates, but most is “fixed” and very little is soluble phosphate ions.
  - Nearly all water-soluble phosphates are converted to water-insoluble shortly after contact with concrete, thus precluding migration into the concrete.
  - Phosphates in soil and groundwater do not cause rebar corrosion.



# Aging Management Reviews

---

---

## 2) How is corrosion of rebar managed?

- High Quality Concrete - Low Permeability recommended by ACI 201.2R:
  - W/C Ratio  $< 0.45$  [St. Lucie  $\leq 0.44$ ]
  - ASTM C150, Type V Cement [St. Lucie used ASTM C150, Type II Cement, since Type V was adopted by ACI in 1977]
  - Appropriate Air Entrainment [St. Lucie 2.5% - 9% air entrainment]
  - Moist Curing for 7 days [St. Lucie used moist curing for 7 - 14 days]



# Aging Management Reviews

---

- High Quality Concrete (Cont.)
  - High quality constituent materials including aggregates per ASTM C33, Cement per ASTM C150, and clean water [St. Lucie concrete meets all]
  - Cover over steel: 1.5” - 2” minimum [St. Lucie structures have 3” minimum cover]
  - Concrete exposed to saltwater should have a 28 day compressive strength of at least 5000 psi [St. Lucie structures are 4000 and 5000 psi concrete, however, test results indicate >5000 psi was achieved]
  - Waterproof Membranes [St. Lucie has NNS waterproofing membranes on Containments, RABs, and backfilled side of the Intake Structures]



# Aging Management Reviews

---

---

- St. Lucie Concrete Inspections:
  - Exposed interior and exterior concrete surfaces are visually inspected for signs of degradation (spalling, cracking, rust staining).
  - Buried concrete structures are inspected when excavated for any reason. Recent examples resulted in no degradation:
    - Unit 1 Containment (1997 SGRP)
    - UHS Dam (2002 CPS replacement)
    - Unit 1 CCW Building (2002 exploratory excavation)
    - Unit 1 Cask Crane foundations (2003 replacement)



# Aging Management Programs

---

---

- For each aging effect requiring management, aging management programs (AMPs) are identified
  - Descriptions and attribute evaluations provided in Appendix B
    - 10 attribute evaluations for plant-specific programs
    - “Operating Experience and Demonstration” attribute evaluations for GALL programs (other attributes are evaluated as appropriate)
    - Quality assurance requirements and corrective action program discussed in Section 2.0 of Appendix B



# Aging Management Programs

---

---

- 2 categories of AMPs
  - 16 Existing (9 GALL, 7 plant-specific)
  - 7 New (1 GALL, 6 plant-specific)



# Aging Management Programs

---

---

## – Existing AMPs consistent with GALL

- ASME Section XI, Subsections IWB, IWC, and IWD Inservice Inspection Program (GALL program XI.M1)
  - Includes enhancements suggested by NRC for Turkey Point
- ASME Section XI, Subsection IWE Inservice Inspection Program (GALL programs XI.S1 and XI.S4)
  - St. Lucie program includes Appendix J testing in IWE program
- ASME Section XI, Subsection IWF Inservice Inspection Program (GALL program XI.S3)
- Boraflex Surveillance Program (GALL program XI.M22)
  - Includes enhancement for areal density testing



# Aging Management Programs

---

## – Existing AMPs consistent with GALL (cont.)

- Boric Acid Wastage Surveillance Program (GALL program XI.M10)
  - St. Lucie program includes more systems than GALL
- Chemistry Control Program (includes 3 subprograms)
  - Water Chemistry Control Subprogram (GALL program XI.M2)
  - Closed-Cycle Cooling Water System Chemistry Subprogram (GALL program XI.M21)
  - Fuel Oil Chemistry Subprogram (plant-specific)
- Environmental Qualification Program (GALL program X.E1)



# Aging Management Programs

---

- Existing AMPs consistent with GALL (cont.)
  - Flow Accelerated Corrosion Program (GALL program XI.M17)
    - Includes enhancements for small bore steam trap and drain lines
  - Steam Generator Integrity Program (GALL program XI.M19)
    - St. Lucie program includes additional secondary side activities



# Aging Management Programs

---

## – Existing Plant-Specific AMPs

- Alloy 600 Inspection Program
- Fatigue Monitoring Program
  - Includes enhancement from Turkey Point program
- Fire Protection Program
- Intake Cooling Water Inspection Program
- Periodic Surveillance and Preventive Maintenance Program
  - Includes specific enhancements for in-scope components based on the aging management reviews



# Aging Management Programs

---

---

- Existing Plant-Specific AMPs (cont.)
  - Reactor Vessel Integrity Program
  - Systems and Structures Monitoring Program
    - Includes enhancements for managing aging effects for inaccessible concrete, inspection of insulated equipment and piping, and evaluating masonry wall degradation and uniform corrosion



# Aging Management Programs

---

- New AMP consistent with GALL
  - Thermal Aging Embrittlement of Cast Austenitic Stainless Steel (CASS) Program (GALL program XI.M12)
  
- New Plant-Specific AMPs
  - Condensate Storage Tank Cross-Connect Buried Pipe Inspection
  - Containment Cable Inspection Program
  - Galvanic Corrosion Susceptibility Inspection Program



# Aging Management Programs

---

---

- New Plant-Specific AMPs (cont.)
  - Pipe Wall Thinning Inspection Program
  - Reactor Vessel Internals Inspection Program
  - Small Bore Class 1 Piping Inspection



# Time Limited Aging Analyses

---

---

- Reactor Vessel Embrittlement
- Metal Fatigue (RCS and BOP)
  - 40 year design cycles determined to be conservative and bounding for the extended period of operation
  - The approach to EAF consistent with that used for Turkey Point
- Environmental Qualification
  - Incorporated lessons learned from the Turkey Point review
    - Wear cycle aging
    - Classification of EQ TLAAAs (ii vs. i)
    - Temperature and radiation monitoring



# Time Limited Aging Analyses

---

- Containment Penetration Fatigue
- RCS Piping Leak Before Break
- Crane Fatigue
- Unit 1 Core Support Barrel Repair
- Alloy 600 Instrument Nozzle Repairs
- No time bound license exemptions identified



FPL

# Conclusions

---

- The aging management programs at St. Lucie will adequately manage aging effects so that the intended functions of in-scope SSCs will be maintained consistent with the current licensing basis for the period of extended operation
- All TLAAs for St. Lucie were identified, evaluated, and shown to be acceptable for the extended period of operation



---

## St. Lucie Units 1 and 2 License Renewal SER with Open Items

Staff Presentation to the ACRS  
Noel Dudley, Sr. Project Manager  
April 9, 2003

---



---

## Agenda

- › Staff Introduction (P .T. Kuo)
  - › Applicant Presentation (S. Hale)
  - › Overview (N. Dudley)
  - › Status of Open Items (N. Dudley, D. Nguyen,  
and J. Medoff)
  - › Scoping and Screening Methodology  
(G. Galletti)
-



---

## Agenda (continued)

- › Scoping and Screening Results (N. Dudley)
- › Aging Management Reviews (N. Dudley)
- › Aging Management Program Inspections (C. Julian)
- › Concrete Aging (D. Jeng)
- › Aging Management Programs (N. Dudley)
- › Time Limited Aging Analysis (N. Dudley and J. Fair)
- › Interim Staff Guidance (J. Cushing)

---

April 9, 2003

3



---

## Overview

### St. Lucie Nuclear Plant, Units 1 and 2

- › Hutchinson Island, St. Lucie County, Florida
- › Combustion Engineering/Large Dry Containments
- › Both Units generate 2700 megawatts thermal, and 890 megawatts electrical
- › Unit 1 license expires March 1, 2016
- › Unit 2 license expires April 6, 2023

---

April 9, 2003

4



---

## NRC Review Process

- › 156 RAIs issued
- › 11 open items
- › 8 confirmatory items
- › 7 meetings
- › 9 conference calls

---

April 9, 2003

5



---

## Results of NRC Review

- › 78 new structures (SCs) and components brought into scope and subjected to AMR
- › 48 of these SCs required AMPs
- › 1 new AMP

---

April 9, 2003

6



---

## NRC Audit and Inspections

- Scoping Methodology Review Audit
  - April 16 - 18, 2002
- Scoping Inspection
  - October 21 - 25, 2002
- Aging Management Review Inspection
  - January 13 - 17 and January 27 - 31, 2003

---

April 9, 2003

7



---

## Open Items

- 3.0.2.2-1: Verify that there is no open item in the AMR inspection report (resolved)
  - AMR inspection report issued
  - No open inspection items

---

April 9, 2003

8



---

## Open Items (continued)

- ▶ 3.0.5.7-1: Manage aging of fire protection system piping wall thinning (resolved)
  - ▶ Volumetric inspection completed
  - ▶ Minimum loss of material
  - ▶ Projected worst case corrosion rate

---

April 9, 2003

9



---

## Open Items (continued)

- ▶ 3.0.5.10-1: Manage aging of intake cooling water system small bore piping
  - ▶ Aging management programs
  - ▶ Material replacement program
  - ▶ Small corrosion cells lead to leakage

---

April 9, 2003

10



---

## Open Items (continued)

- ▶ 3.1.0.1-1: Manage aging of Alloy 600/690 and 82/182
  - ▶ Commitment to implement past and future commitments
  - ▶ Orders issued in February 11, 2003

---

April 9, 2003

11



---

## Open Items (continued)

- ▶ 3.1.0.1-2: Alloy 600 Inspection Program
  - ▶ Program applies to other Alloy 600 components besides those addressed in NRC Bulletins

---

April 9, 2003

12



---

## Open Items (continued)

- 3.1.0.3-1: Risk-informed methodologies for managing aging of small bore Class 1 piping (resolved)
  - Risk-informed methodology will not be used to eliminate inspection of components
  - Inclusion of information in the future program description

---

April 9, 2003

13



---

## Open Items (continued)

- 3.1.0.5-1: Reactor vessel surveillance capsule removal (resolved)
  - Clarification of end of life fluence values used for capsule removal schedules
  - Unit 1: 52 EFPY
  - Unit 2: 55 EFPY

---

April 9, 2003

14



---

## Open Items (continued)

- 3.1.1.2-1: Manage stress relaxation of non-Class 1 bolting material (resolved)
  - A concern at temperatures above 700 degrees F
  - Components are in environments below 700 degrees F

---

April 9, 2003

15



---

## Open Items (continued)

- 3.1.2.1-1: Pressurizer spray nozzle welds (resolved)
  - Thermal sleeves are machined, inserted, and expanded
  - Sleeves protect nozzles from thermal shock

---

April 9, 2003

16



## Open Items (continued)

- ▶ 3.6.2.1-1: Fuse holders
  - ▶ Provide double isolation between non-safety related instrument panel loads and safety-related loads
  - ▶ AMR assessed potential aging stressors
    - ▶ Located in electrical room panels
    - ▶ Copper alloy plated with corrosion resistant material
    - ▶ Low corrosion rate

April 9, 2003

17



## Open Items

- ▶ 4.6.4-1: Alloy 600 instrument nozzle repairs
  - ▶ Commitment to address TLAA pertaining to:
    - ▶ Flaw growth analysis of thermal and mechanical cycling
    - ▶ Potential wastage of ferritic material exposed to borated reactor coolant
  - ▶ Relief request from meeting ISI requirements as set forth in ASME Section XI
    - ▶ Implement alternative inspection/evaluation methods acceptable to NRC
    - ▶ Implement appropriate nozzle replacements complying with ASME Code requirements

April 9, 2003

18



---

## Confirmatory Items

- Resubmit response:
  - 2.3.3.7-1 SFP makeup from ICW system
  
- Update FSAR Supplement:
  - 3.0.2.2-1 Specific GALL programs
  - 3.0.5.1-1 Galvanic corrosion AMP
  - 3.0.5.4-1 Boric acid wastage AMP
  - 3.1.0.1-1 Alloy 600 AMP
  - 3.1.0.3-1 Small-bore piping AMP
  - 3.6.2.1-1 Non-EQ cables and connectors AMP
  - 4.3.1-1 Environmental assisted fatigue

---

April 9, 2003

19



---

## Revised Oversight Process

- Last update: December 2002 – all green

---

April 9, 2003

20



---

Break

---



---

## Scoping and Screening Methodology Review

- › Staff's review process
    - › Desktop review
    - › On site audit April 16 through 18, 2002
  - › Findings
  - › Conclusions
- 

April 9, 2003

22



---

## Scoping and Screening Results (52 RAIs)

- › Plant-level scoping
- › Mechanical
- › Structures
- › Electrical and I&C Systems

---

April 9, 2003

23



---

## Scoping and Screening Results Conclusion

- › The staff concluded that there is reasonable assurance that the applicant has appropriately identified components subject to an AMR in accordance with the requirements stated in 10 CFR 54.21 (a) (1).

---

April 9, 2003

24



---

## Aging Management Review Process

- Staff's review process
  - Materials, environments, and aging effects
  - All applicable aging effects were identified
  - Aging effects listed were appropriate
  - Identify appropriate AMP

---

April 9, 2003

25



---

## Aging Management Review Process (continued)

- Staff's reference documents
  - Standard Review Plan for License Renewal
  - NUREGs
  - Regulatory Guides
  - Information Notices
  - Generic Letters
  - Bulletins
  - Branch Technical Positions

---

April 9, 2003

26



---

## Aging Management Review Process (continued): 56 RAIs

- › Section 3.1, Reactor Coolant System
- › Section 3.2, Engineered Safety Features
- › Section 3.3, Auxiliary Systems
- › Section 3.4, Steam and Power Conversion Systems
- › Section 3.5, Containment, Structures and Components Supports
- › Section 3.6, Electrical and I&C

---

April 9, 2003

27



---

## Aging Management Review Process Conclusion

- › The staff concluded that the applicant has demonstrated the aging effects associated with the different structures and components will be adequately managed so that there is reasonable assurance that the intended functions will be maintained consistent with the CLB for the period of extended operation, as required by 10 CFR 54.21 (a) (3).

---

April 9, 2003

28



---

Break

---



---

## License Renewal Inspection Program Implementation

- › License renewal Manual Chapter - MC 2516
  - › License renewal inspection procedure - IP 71002
  - › Site-specific inspection plan for each applicant
  - › Scheduled to support NRR's review
  - › Resources - consistent team of the same five inspectors
  - › Training program for replacement team members
- 

April 9, 2003

30



---

## License Renewal Inspections

- › Scoping and screening inspection
- › AMP inspection
- › Third optional inspection

---

April 9, 2003

31



---

## Scoping and Screening Inspection

- › Objective: to confirm that the applicant included appropriate SSCs in the scope of license renewal
- › One week in length, conducted October 21 - 25, 2002, at St. Lucie site
- › Concluded that scoping and screening process was successful in identifying those SSCs needing aging management review
- › Documentation was of good quality with minor exceptions

---

April 9, 2003

32



---

## Aging Management Program Inspection

- › Objective: to confirm that existing AMPs are working well and to examine the applicant's plans for establishing new AMPs and enhancing existing AMPs
- › Two weeks in length, conducted January 13 through 17, and January 27 through 31, 2003
- › Electrical cable manholes periodic inspection program needed enhancements -- few flooding instances
- › Documentation was of good quality

---

April 9, 2003

33



---

## Third (Optional) Inspection

- › Objective: to review inspection open items identified during RAI and inspection process
- › Not needed
- › Applicant has already established tracking system for future actions

---

April 9, 2003

34



---

## Below Grade Concrete

- Concrete structures are in an aggressive ground water environment
- Systems and Structures Monitoring Program (SSMP)
  - Periodic inspections of structure interiors
  - Inspections conducted when structures are excavated

---

April 9, 2003

35



---

## Aging Management Programs (AMPs)

- Use of GALL Report
- Standard review process
  - Standard Review Plan for License Renewal
  - Ten attributes are evaluated
  - Conference calls
  - Requests for additional information

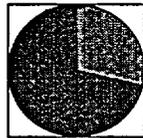
---

April 9, 2003

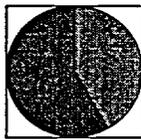
36



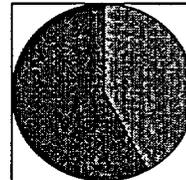
## Aging Management Programs



■ New AMPs  
■ Existing AMPs



■ Common  
■ System Specific



■ GALL  
■ Non-GALL

April 9, 2003

37



## Aging Management Programs Conclusion

- › The staff concluded that the FSAR supplements contain, as appropriate, summary descriptions of the programs and activities for managing the effects of aging as required by 10 CFR 54.21 (d).

April 9, 2003

38



Break



## Time-limited Aging Analyses (TLAAs)

- ▶ 10 CFR 54.21 (c) (1): Applicant shall demonstrate that
  - ▶ Analysis valid for period of extended operation (PEO)
  - ▶ Analysis projected to end of PEO
  - ▶ Manage the effects of aging



## Reactor Vessel Neutron Embrittlement Upper-Shelf Energy (USE)

- › Analysis of USE projected to end of PEO
  - › Unit 1: 56 to 73 ft-lbs
  - › Unit 2: 70 to 130 ft-lbs
- › Staff performed independent calculation

April 9, 2003

41



## Reactor Vessel Neutron Embrittlement Pressurized Thermal Shock (PTS)

- › Analysis of PTS projected to end of PEO
- › Staff performed independent calculation

|                        | <b>Limit</b> | <b>Unit 1</b>   | <b>Unit 2</b>  |
|------------------------|--------------|-----------------|----------------|
| <b>Plates/Forgings</b> | 270 degrees  | 100-241 degrees | 45-172 degrees |
| <b>Beltline Welds</b>  | 300 degrees  | 65 degrees      | 62 degrees     |

April 9, 2003

42



## Metal Fatigue

- › Number of design transient cycles bound the number of projected cycles for PEO
- › Applied environmental multipliers
  - › Six locations evaluated IAW NUREG/CR-6260
  - › Pressurizer surge line elbows may exceed code limit during PEO
  - › Commitment to possible further actions prior to PEO

April 9, 2003

43



## Leak Before Break

- › Analysis of allowable flaw size under normal and faulted loads is valid for PEO
- › Fatigue Monitoring Program (FMP) used to confirm flaw growth analysis is valid for PEO

April 9, 2003

44



---

## Schedule

- › Issue SER on July 8, 2003
- › Hold ACRS Full Committee meeting in September 2003
- › Issue renewed licenses on October 3, 2003



---

# Interim Staff Guidance (ISG)

## Process and Status

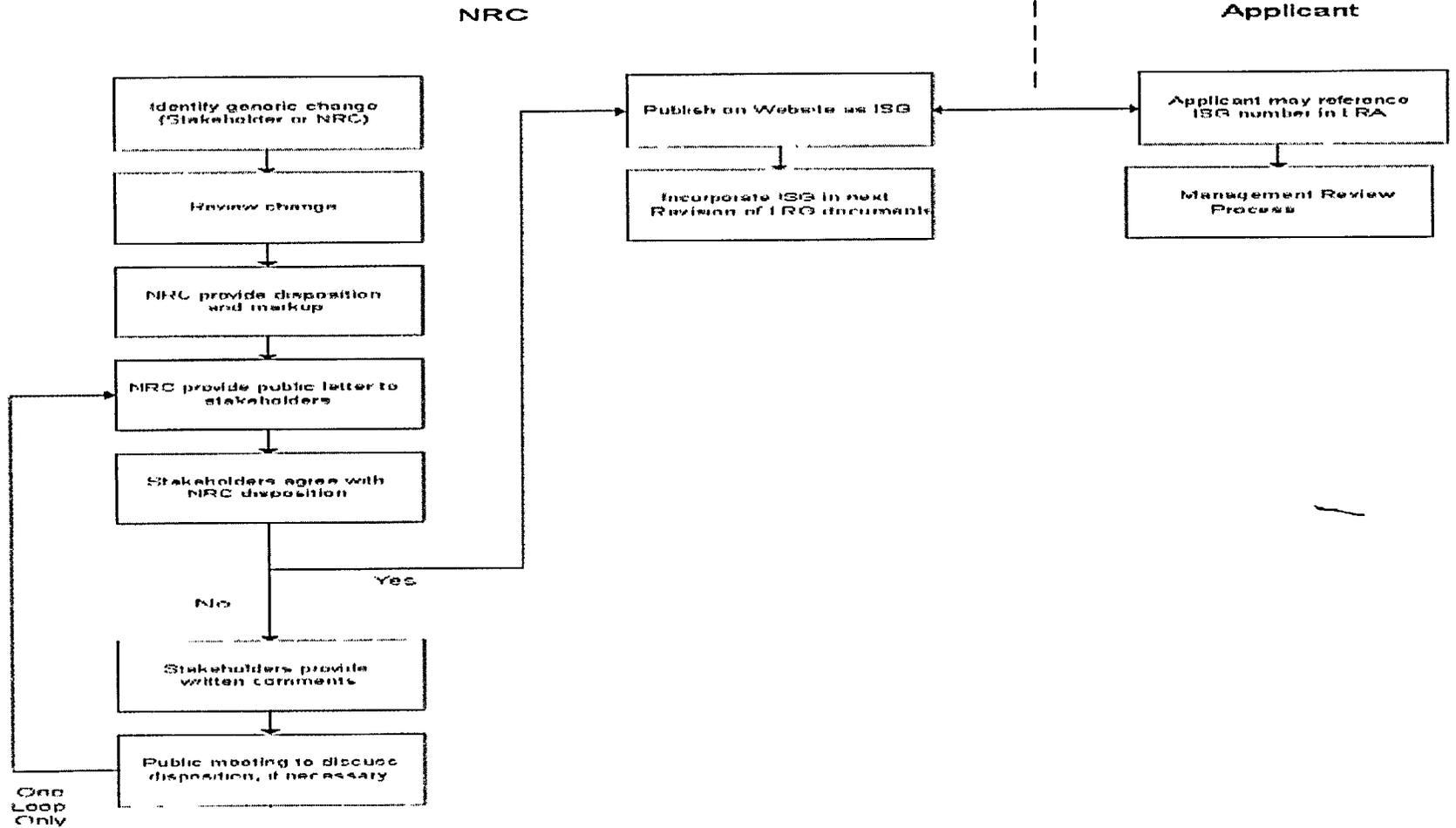
---



---

## Introduction

- › The purpose of the ISG process is to provide timely guidance to applicants for new staff positions.
  - › The ISG process includes identification and implementation of the ISGs for current and future applicants.
  - › The ISG process addresses evaluating licensees with renewed licenses.
-





---

## Development of the ISG

- Two types of ISGs
  - Clarification ISGs
  - Compliance ISGs

---

April 9, 2003

49



---

## Implementation: Applicants

- Applicants must address all approved ISGs before the renewed license is issued.
- Applicants may address ISGs before they are approved.

---

50



---

## Implementation: Licensees Holding a Renewed License

- › Staff tracks ISGs for licensees holding renewed licenses.
- › Committee to Review Generic Requirements (CRGR) will evaluate the staff's ISGs for applicability to licensees holding a renewed license.

---

April 9, 2003

51



---

## ACRS Involvement

- › Applicable ISGs are addressed in the SER.
- › ACRS will be briefed when the license renewal guidance documents are updated.

---

52



# ISG Status

| No. | Approved ISG No.<br>ISG Issue  | Purpose  | Status<br>Issuance Date |
|-----|--|--|-------------------------|
| 1   | ISG-01<br>GALL report contains one acceptable way, not only way          | To clarify that GALL report contains one acceptable way, not only way                                      | Completed<br>11/23/01   |
| 2   | ISG-02<br>Station Blackout Scoping (SBO)                                 | To add SBO scoping   | Completed<br>4/1/02     |
| 3   | ISG-03<br>Concrete Aging Management Program                              | To clarify the acceptable aging management programs (AMPs) in GALL and SRP                                 | Completed<br>11/23/01   |
| 4   | ISG-04<br>Fire Protection System Piping                                  | To clarify AMPs X1.M26 and M27   | Completed<br>12/3/02    |
| 5   | ISG-05<br>Identification and Treatment of Electrical Fuse Holders        | To include fuse clips and fuse block for fuse holders and to add a new AMP for fuse clips (i.e., metallic) | Completed<br>3/10/03    |
| 6   | Identification and Treatment of Housing of Active Components             | To clarify a need for AMR for housing of fans, dampers, and H/C coils                                      | Under staff development |
| 7   | Scoping Guidance for Fire Protection Systems, Structures, and Components | To clarify fire protection scoping   | Awaiting NEI response   |



# ISG Status (continued)

| No. | ISG Issue   | Purpose  | Status   |
|-----|---|--|--|
| 8   | Updating the Improved Guidance Documents, ISG Process   | To establish ISG process. Appeal will be a part of ISG process               | Deleted from ISG list per meeting with NEI on 2/13/03<br>(non-technical issue) |
| 9   | Scoping Criteria 10 CFR 54.4 (a) (2)  | To clarify the scoping criteria in 10 CFR 54.4 (a) (2)                       | NEI responded 2/24/03<br>Under staff development                               |
| 10  | Class of '03 Standard License Renewal Application Format  | To standardize license renewal format for 2003 applicants                    | Deleted from ISG list per meeting with NEI on 2/13/03<br>(non-technical issue) |
| 11  | Aging Management of Environmental Fatigue for Carbon/Low Alloy Steel                                      | To review this fatigue issue as an ISG process, as agreed by 9/18/02 meeting | NEI submitted on 1/17/03<br>Under staff development                            |
| 12  | Operating Experience with Cracking of Class 1 Small Bore Piping   |  | Identified as an ISG at 5/29/02 meeting, under staff development               |
| 13  | Management of Loss of Preload on Reactor Vessel Internals Bolting Using the Loose Parts Monitoring System |  | Identified as an ISG at 5/29/02 meeting, under staff development               |
| 14  | Operating Experience with Cracking on Bolting   |  | Identified as an ISG at 5/29/02 meeting, under staff development               |



---

## Summary

- › The ISG process:
  - Captures lessons learned from staff reviews,
  - Provides timely guidance to applicants for license renewal,
  - Ensures facilities with renewed licenses will be evaluated for the applicable ISGs.