MEMBER WALLIS: Materials and the fluents?

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

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

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

MEMBER WALLIS: Which is based on samples?

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

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

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

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

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

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

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

MEMBER ROSEN: It seems extraordinarily good.

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

MEMBER ROSEN: These are numbers for extended operation?

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

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

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

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

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

MR. DUDLEY: That's correct.

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

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

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

MEMBER ROSEN: The stresses were low

enough.

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

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

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

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

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

CHAIRMAN BONACA: This is the ARGON data?

MR. FAIR: This is the ARGON data.

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

MEMBER WALLIS: So where are these flaws?

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

MEMBER WALLIS: It's anywhere in the piping?

MR. DUDLEY: Yes.

MEMBER WALLIS: In the primary system?

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

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

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

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

MEMBER WALLIS: It's a factor of two?

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

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

MR. DUDLEY: Okay. Any other questions?

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

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

MEMBER LEITCH: There's a section on that

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

MEMBER LEITCH: That's exactly my

question.

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

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

MR. KUO: Right, I understand.

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

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

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

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

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

MR. HALE: Yes.

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

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

MR. HALE: Oh, okay. Thank you.

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

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

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

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

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

MEMBER ROSEN: That is the shortest presentation on record.

CHAIRMAN BONACA: That was a great presentation.

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

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

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

MR. CUSHING: Yes, I understand.

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

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

MR. KUO: Information Summary.

MEMBER LEITCH: Okay. Thank you.

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

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

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

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

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

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

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

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

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

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

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

documented evaluation.

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

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

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

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

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

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

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

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

CHAIRMAN BONACA: What is the seismic II over I?

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

CHAIRMAN BONACA: But where is it?

MR. CUSHING: Excuse me? Where is it?

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

MR. CUSHING: Number nine.

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

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

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

CHAIRMAN BONACA: Yes.

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

MR. CUSHING: And, as part of the license

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

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

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

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

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

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

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

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

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

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

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

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

MEMBER ROSEN: It would be a cost benefit evaluation?

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

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

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

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

aspect.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

CHAIRMAN BONACA: Before we move on to the

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

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

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

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

MEMBER ROSEN: I think this may be a fine

point.

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

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

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

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

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

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

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

CHAIRMAN BONACA: You can just bring it up now.

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

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

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

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

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

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

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

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

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

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

CHAIRMAN BONACA: Thank you. Peter?

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

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

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

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

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

But those are my three generic --

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

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

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

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

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

we'll emphasize over other?

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

committee; they will be interested in that.

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

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

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

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

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

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

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

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

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

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

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, tjk1@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** A. Background B. License Renewal Application Scoping and Screening Process C. Aging Effects D. Aging Management Programs E. Time Limited Aging Analyses	S. Hale	8:45-9:30 a.m.
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 J. Medoff D. Nguyen J. Fair S. Sheng	9:30-10:15 a.m.
	BREAK		**10:15-10:30 a.m.**
V.	**SER Chap. 2:** Scoping and Screening Methodology and Results, and aging management reviews	G. Galletti N. Dudley	10:30-11:30 noon
	LUNCH		**11:30-12:30 p.m.**
VI.	**Aging Management Program Inspections and Concrete Aging Issues**	N. Dudley C. Julian D. Jeng	12:30-1:00 p.m.
VII.	**SER Chap. 3:** Aging Management Programs		1:00-1:30 p.m.
	BREAK		**1:30-1:45 p.m.**
VIII.	**SER Chap. 4:** Time Limited Aging Analyses		
	A. Overview B. Reactor Vessel Neutron Embrittlement C. Thermal Fatigue D. Leak-before-break	N. Dudley	1:45-2:15 p.m.
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

FPL

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

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.

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

TABLE 3.2-4
SAFETY INJECTION

Component / Commodity Group [GALL Reference]	Intended Function	Material	Environment	Aging Effect Requiring Management	Program/Activity
Internal Environment					
Safety injection tanks [V D1.7.3]	Pressure boundary	Stainless steel	Treated water - borated	Loss of material 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 Cracking	Chemistry Control Program
High pressure safety injection pumps [V D1.2 1]	Pressure boundary	Stainless steel	Treated water - borated	Loss of material[1]	Chemistry Control Program
Shutdown cooling heat exchanger tubes [V D1.5 2]	Pressure boundary Heat transfer	Stainless steel	Treated water - borated (inside diameter)	Loss of material Fouling Cracking	Chemistry Control Program
			Treated water - other (outside diameter)	Loss of material Fouling	Chemistry Control Program
Shutdown cooling heat exchanger tube sheets	Pressure boundary	Carbon steel clad with stainless steel	Treated water - borated	Loss of material Cracking	Chemistry Control Program
			Treated water - other	Loss of material	Chemistry Control Program Galvanic Corrosion Susceptibility Inspection Program

TABLE 3.2-4 (continued)
SAFETY INJECTION

Component / Commodity Group [GALL Reference]	Intended Function	Material	Environment	Aging Effect Requiring Management	Program/Activity
External Environment					
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

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 ≤ 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 TLAAs (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)

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

NRC Review Process

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Revised Oversight Process

- Last update: December 2002 – all green

Break

Scoping and Screening Methodology Review

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

Scoping and Screening Results (52 RAIs)

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

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).

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

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

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

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).

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

License Renewal Inspections

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

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

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

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

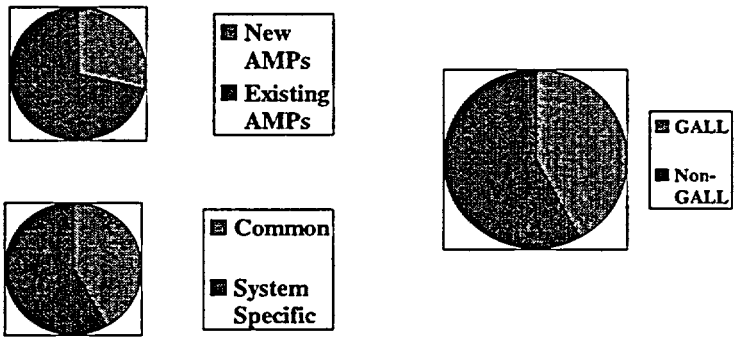
Below Grade Concrete

- 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

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

Aging Management Programs



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).

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

Reactor Vessel Neutron Embrittlement Pressurized Thermal Shock (PTS)

- Analysis of PTS projected to end of PEO
- Staff performed independent calcuation

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

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

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

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.

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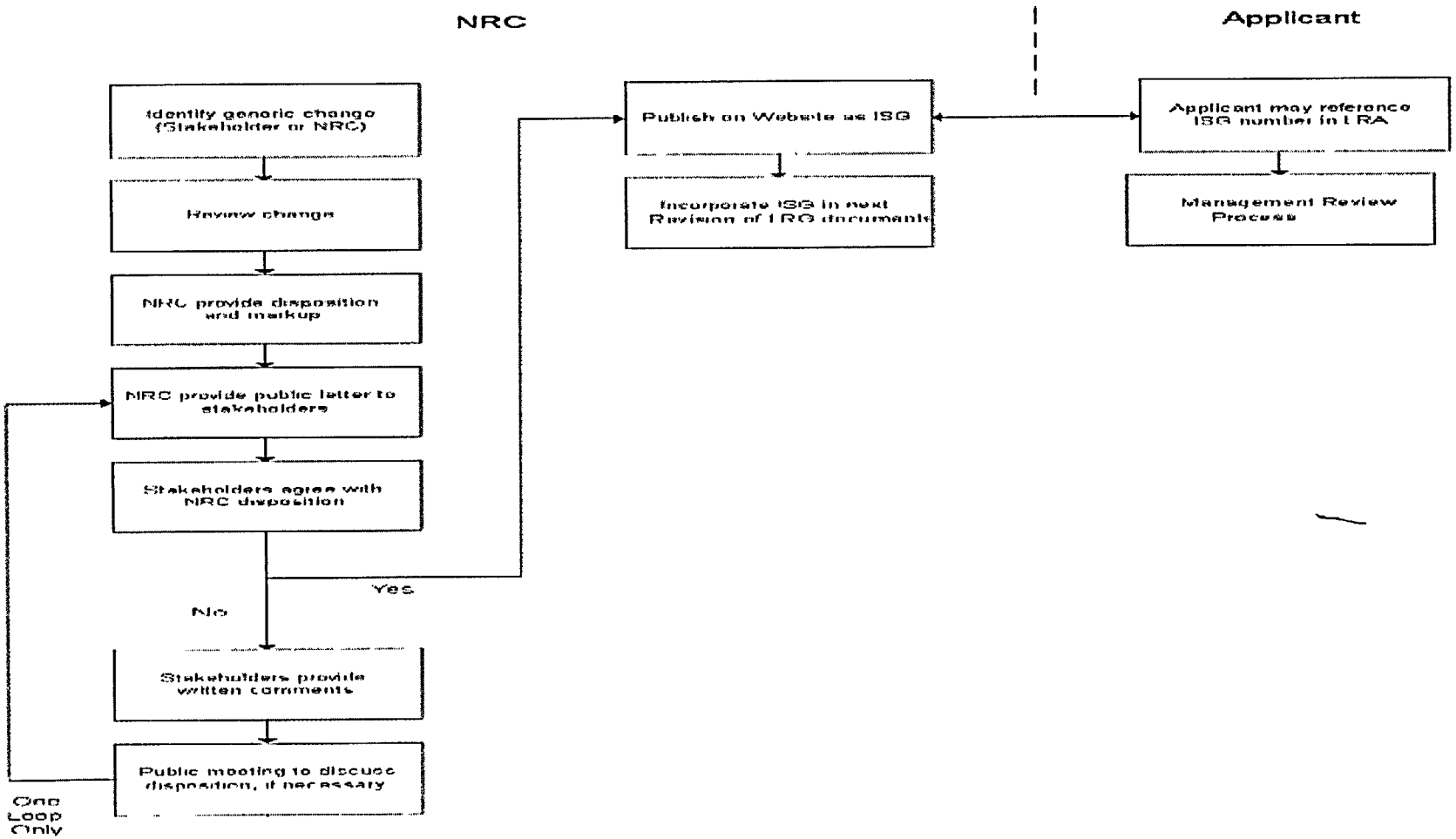
NRC
Applicant
Identify generic change (Stakeholder or NRC)
Review change
NRC provide disposition and markup
NRC provide public letter to stakeholders
Stakeholders agree with NRC disposition
Yes
No
Stakeholders provide written comments
Public meeting to discuss disposition, if necessary
One Loop Only
Publish on Website as ISG
Incorporate ISG in next Revision of LRG documents
Applicant may reference ISG number in LRA
Management Review Process

Development of the ISG

- Two types of ISGs
  - Clarification ISGs
  - Compliance ISGs

Implementation: Applicants

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

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.

ACRS Involvement

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

ISG Status

No.	Approved ISG No. ISG Issue	Purpose	Status Issuance Date
1	ISG-01 GALL report contains one acceptable way, not only way	To clarify that GALL report contains one acceptable way, not only way	Completed 11/23/01
2	ISG-02 Station Blackout Scoping (SBO)	To add SBO scoping	Completed 4/1/02
3	ISG-03 Concrete Aging Management Program	To clarify the acceptable aging management programs (AMPs) in GALL and SRP	Completed 11/23/01
4	ISG-04 Fire Protection System Piping	To clarify AMPs X1.M26 and M27	Completed 12/3/02
5	ISG-05 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 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 (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 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 (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 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.

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