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NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

500th ACRS MEETING

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FRIDAY, MARCH 7, 2003

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The meeting came to order at 8:30 a.m. in room T2B4 of Two White Flint North, Rockville, Maryland, Mario V. Bonaca, Chairman, presiding.

PRESENT:

MARIO V. BONACA	ACRS Chairman
GRAHAM B. WALLIS	ACRS Vice-Chairman
GEORGE E. APOSTOLAKIS	ACRS Member
F. PETER FORD	ACRS Member
GRAHAM M. LEITCH	ACRS Member
VICTOR H. RANSOM	ACRS Member-at-Large
THOMAS S. KRESS	ACRS
DANA A. POWERS	ACRS
WILLIAM J. SHACK	ACRS
JOHN D. SIEBER	ACRS

STAFF PRESENT:

JOHN T. LARKINS	Executive Director, ACRS/ACNW
MEDHAT EL-ZEFTAWY	ACRS Staff
SAM DURAISWAMI	ACRS/ACNW
SHER BAHADUR	ACRS/ACNW
HOWARD J. LARSON	Special Assistant, ACRS/ACNW
RONALDO JENKINS	Early Site Permit Project Manager
MICHAEL SCOTT	Early Site Permit Project Manager
WILLIAM BURTON	Project Manager
RANI FRANOVICH	Senior Materials Engineer
PT KUO	Project Director, License Renewal

I-N-D-E-X

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

8:35 a.m.

CHAIRMAN BONACA: Good morning. The meeting will now come to order. This is the second day of the 500th meeting of the Advisory Committee on Reactor Safeguards. During today's meeting, the committee will consider the following: Early site permitting process, overview of the format and content of the Fort Calhoun license renewal application, future ACRS activities, report of the Planning and Procedures Committee, reconciliation of ACRS comments and recommendations, preparation for meeting with the NRC commissioners and propose the CRS reports.

This meeting is being conducted in accordance with the provisions of the Federal Advisory Committee Act. Mr. Sam Duraiswamy is the designated federal official for the initial portion of the meeting. We have received no written comments or requests for time to make oral statements from members of the public regarding today's session. A transcript of all portions of the meeting is being kept, and it is requested that the speakers one of the microphones, identify themselves and speak with sufficient clarity and volume so that they can be readily heard.

At this point, we will move to the first

item on the agenda, the early site permit process, and Dr. Kress will take us through this presentation.

MEMBER KRESS: Thank you, Mr. Chairman. As you know, there are at least three pending applications for early site permits coming up in the near future, I think June is the first one -- first two. And since the ACRS has had its ore in the water on siting issues for a long time, I thought it would be a good idea for us to at least know what the process is that's playing for early site permitting and to start getting up to speed on it a little bit.

One of the concepts that has been put forward on early site permitting has to do with the NEI I think has proposed a plant parameter envelope. And to kind of give you an idea of what that is, I had Ned place in front of you a table that was extracted from one of the NEI documents that gives you an idea of what they had in mind of what a plant parameter envelope might consist of. And I don't know what it looks like -- it's under Tab 8, I guess, of your book.

So I think we probably have a letter on this.

MR. JENKINS: Right. We have some extra copies if you want to pass them around.

MEMBER KRESS: Okay, yes. Okay. So with

that, I'll turn it over to the staff. Did you want to say some words, Jerry, before --

MR. WILSON: No. We'll have Mr. Jenkins make the presentation today for the New Reactor Licensing Project Office.

MEMBER KRESS: Thank you.

MR. JENKINS: Good morning. My name is Renaldo Jenkins, and I am an Early Site Permit Project Manager. On the speaker phone is Michael Scott who is my partner in terms of looking at site permit review standard.

The first slide -- go onto the next slide. Our purpose here is to brief the Commission -- excuse me, brief the Committee on the status of activities leading up to receipt of the first three ESP applications, to brief the Committee on the contents of the draft ESP review standard, to discuss future milestones for the ESP review standard document development and use and to address any questions or comments that you might have either on the process or the early site permit review standard. Next slide.

This is what we see as the agenda going through looking at the ESP issues and planned activities, the review standard document development approach, the document content and also plans for

future development and use of the ESP standard. Next slide.

The staff has been engaged with the Nuclear Energy Institute, NEI, and the potential applicants to facilitate the resolution of issues that have been raised prior to the submittal of these applications. The staff has, in the course of this past year, sent letters to the NEI to document the staff's position on these issues, and we plan to develop a SECY paper to communicate to the Commission our positions with respect to ESP issues. We had our last meeting on Wednesday of this week, and there are no additional ESP generic meetings planned with NEI before the applications are going to be submitted. However, we do plan to deal with any emerging issues that might come up raised by the applicants on a case-by-case basis. Next slide.

MEMBER KRESS: Are there issues now that you still are no in agreement on with the NEI?

MR. JENKINS: We're in the course of waiting for letters from NEI on certain positions that we met with them on, and once we get those letters then we can develop our response. Our process is just to listen to what they have to say and then give the staff's view on those issues. So it's not really a

question of a disagreement. We have put out the review standard to outline what the review guidance would be for an ESP application.

MEMBER KRESS: Has that standard gone out for public comment?

MR. JENKINS: Yes, it has. That was December of last year. And the public comment period is due to close at the end of this month.

MEMBER LEITCH: Renaldo, one of the things is this early site permit is still neutral or silent, I suppose, as far as the type of reactor that could be built on that site; is that right?

MR. JENKINS: The current regulations basically indicate that an applicant should provide information regarding the type of reactor.

MEMBER LEITCH: Oh, that's different, I think, from the last time we discussed this.

MR. JENKINS: No, no. The language is it should and so it's not a requirement.

MEMBER LEITCH: Oh, it should. Okay. Okay. Okay.

MR. JENKINS: And matter of fact, that's -- industry has proposed that it be neutral, as you say, that the type of plant. And that's really part of the discussion we've had, one of the issues we've

had with them on the PPE approach.

MEMBER KRESS: That goes to your second bullet.

MR. JENKINS: Right. The next couple of slides basically deal with the generic issues that we've been talking with NEI on. The first one, the staff position on QA. The staff expects that ESP applicants will use the applicable QA controls equivalent to those in Part 50 Appendix B for ESP activities that would affect the design of future safety-related systems, structures and components or SSCs.

The QA requirement is really on the staff, it's not on the applicant, because the contents of the application regulation doesn't specify that the applicant has to have an Appendix B Program. However, we have indicated to them that this is our review standard, that where site safety information is equivalent what would be in an Appendix B space, that we will use Appendix B guidance as a review criteria.

The next bullet, the plant parameter envelope, or PPE, we basically agreed with the industry that this could be used as a surrogate in lieu of specific design information. The next bullet --

MEMBER LEITCH: That's the question that I have, a number of aspects about that. Do they have to specify how many reactors are potentially going to be built on this site -- one, ten?

MR. JENKINS: Well, in the content of the application, it talks about the number of units.

MEMBER LEITCH: Is that also a "should," though? It might not happen?

MR. JENKINS: That's also -- yes, I think that's also a should. That's under the information that's to be provided. But it would be very hard for the staff to proceed forward without knowing that information.

MEMBER LEITCH: I would think so, yes. Also, do they specify a megawatt thermal capacity at the site?

MR. JENKINS: Yes. That's also in the -- under that broad category of shoulds.

MEMBER KRESS: Both those are items that are in the plant parameter envelope, I think, aren't they?

MEMBER LEITCH: Well, yes. I believe that's part of the NEI worksheet.

MEMBER KRESS: Maybe you're going to talk about this later, but are you looking at sites that

already have been approved and have a plant on it differently from a site that's just a new site and doesn't have a plant on it and has not been previously approved? Are those two types of sites viewed differently in this context?

MR. JENKINS: Well, in the review standard we take the approach that there's not an existing site. Essentially, all the information would be for greenfield --

MEMBER KRESS: You're saying that would certainly capture an existing site.

MR. JENKINS: Right. It really -- it captures both.

MEMBER KRESS: Well, my question, I guess, is is that too much to ask for a site that already has been approved and --

MR. JENKINS: Well, the three applicants, Grand Gulf, Clinton and North Anna, the sites that you're talking about and the utilities that are represented there, Entergy, Exelon and Dominion, they are proposing a site approval, which is different than the construction and operating license for the existing facility there. That's a different licensing process.

One of the differences during the

construction permit process the applicant had to specify a design for the plant and also a given footprint, and that was the approval for that particular facility. In this case, we're talking about approval of a site for non a specific design; in other words, a design that's not specified prior to any site approval.

To answer your broader question, we expect that the applicants that are pending before us will use existing information that's applicable.

MEMBER KRESS: Just bring it together.

MR. JENKINS: Just bring it together. They have the task of demonstrating that that information is applicable and relevant to this new site. When we went to Grand Gulf, the footprint for the new facility is in a different location, and it's different also than the construction permit that might have been approved there.

MEMBER KRESS: The distant to the site boundary may have changed.

MR. JENKINS: Right.

MEMBER KRESS: And the underlying ground structure may be different?

MR. JENKINS: Well, during the site visit we were observing their seismic investigation, and the

purpose of the seismic investigation was to confirm that the geological and geophysical properties for the new footprint would be the same, and therefore they could use that existing information, as found in the FSAR 4, in this case Grand Gulf.

MEMBER KRESS: Is that kind of thing laid out in the standard that a review should consist of a site visit to validate those things?

MR. JENKINS: Well, we have indicated in our response to NEI in terms of a pre-application that arrangements should be made for a voluntary visit of the staff. Now, of course, during the actual review, site visits will probably be necessary.

Okay. As the next bullet indicates, there was an issue regarding duration of the ESP that the --

MEMBER KRESS: The duration means the time the site is approved till it's no longer -- that's the amount of time they have to build a plant there?

MR. JENKINS: No. The duration here is the duration of the site approval. The regulations specify from ten to 20 years, and so the permit that the applicant receives is site approval that they can reference in a COL or use I believe in a construction permit.

MEMBER KRESS: So the applicant decides on

how long he wants and puts it in his application?

MR. JENKINS: Right. The overriding purpose of the ESP is to allow the applicant to bank -- that's the term that's used -- to have the site approval that they can use for whatever purpose that they would. Presumably, the next step would be to make plans for a future facility, but that depends on a lot of different variables.

MEMBER KRESS: When they -- let's say they want to think about this site and get it approved for 20 years and when you start doing things like safety evaluations and environmental impacts, do they have to project 20 years into the future and things like that to decide what the areas going to be like, the population and things?

MR. JENKINS: Right. That's really the heart of the permit is that the information provided has to cover the range of the requested duration that they are looking for. At the last meeting we had, NEI indicated that the applicants are actually looking over a 60-year period to include the 40 years associated with a COL.

MEMBER KRESS: I presume that the site that's already got a plant on it has things like -- already has the wind rows over a year's time period

and has the radiation monitoring --

MR. JENKINS: Right. Right.

MEMBER KRESS: -- on the other site and has emergency plans. Can the applicant just say, "We'll make use of these and that will be our program"? I mean is it as simple -- can they simply say, "We'll just continue doing what's already been done on the site"?

MR. JENKINS: I think from a legal point of view they have to provide all of the information assuming that the other site does not -- that the existing site doesn't exist. But they can use that information and refer to it. So if there's an approved NRC document related to this particular matter, they just simply have to show that it is relevant and applicable to this particular application.

MEMBER KRESS: Can they do that by reference some way or --

MR. JENKINS: I believe they can use it by -- they can but, one again, they have to make the case that it is relevant and applicable. So it depends on the subject matter. You mentioned emergency preparedness. When we talked to them about it, we indicated our expectation that they would make

contacts or arrangements with the local officials and state officials. So there would be presumably at the existing facility arrangements already made, and they would have to simply verify that this would be the case for the new facility or the new site.

MEMBER KRESS: Are there any provisions for -- if some organization wanted to pick a site that's already got a plant on it but it's in relatively high population area and maybe the population is changing since that plant has been built or maybe there's different traffic patterns or whatever, are there any provisions for the staff to look at that and say, "No, we don't think this is a good site because either you can't do an emergency response very well now or the population is such that --

MR. JENKINS: Well, we would have to look at that. And matter of fact, the review standard does call for the staff to look at population estimates.

MEMBER KRESS: But is this just looking to see if these things conform to the current regulations or is there some additional --

MR. JENKINS: Well, the site must meet Part 100 requirements, and Part 100 requirements talk about --

MEMBER KRESS: Well, of course it has to meet Part 100, yes.

MR. JENKINS: Yes. Part 100 requirements require that population considerations be taken into consideration to granting or saying that this site is suitable.

MEMBER KRESS: Let me ask you about that. Part 100 involves dose at the site boundary due to design basis accidents.

MR. JENKINS: Right.

MEMBER KRESS: Well, here we have -- we don't have a design, we have a plant parameter envelope maybe.

MR. JENKINS: Right.

MEMBER KRESS: Can it simply be assumed that whatever plant I'm going to build on there, number one, will likely have a safety status that's better than the existing plants or the same. It could be just like the one on there, that's not specified. But it couldn't it be almost assumed that the new plant's going to meet 10 CFR 100?

MR. JENKINS: Well, we can't --

MEMBER KRESS: We can't make that --

MR. JENKINS: We can't really make a leap of faith to assume that that in fact is going to

occur. If we go to the next slide, the ESP applicants must provide radiological dose consequence evaluations, and this is in the regulations. This is 10 CFR 50.34(a)(1) that, as Part 52 references, that particular regulation must be met.

MEMBER KRESS: This just means they have to specify a source term?

MR. JENKINS: Right. The source -- there's two components, one being the site characteristic, the X/Q or the atmospheric dispersion. And then there's this design information associated with a postulated release, a large release following an accident. And, of course, you're going to need source term and some type of release history in order to make the evaluation that at the boundary, if we're talking about --

MEMBER KRESS: No. What I was thinking is they could say, "Well, we're going to be with X/Q and this source term." They could simply say in their plant parameter envelope that, "We're going to be as good as or better than the current LWR on the site."

MR. JENKINS: Right.

MEMBER KRESS: And then that could be a commitment in the plant parameter envelope. I mean would that be sufficient just to say, "We're going to

be as good or better," and then there be perhaps at the COL stage when they do have a design or when they do decide on what plant they're going to build there, then they could be validated or verified?

MR. JENKINS: Well, the staff has to verify that, and we really can't verify a commitment. We have the dose limit, and you have to see, well, how are you still going to stay within that limit given what you are proposing? And we have a X/Q which is site characteristics. And during the July meeting, the initial position of the Task Force, the NEI Task Force, was to provide a bounding source term as a PPE and bounding release history that would allow presumably the staff to come to that determination. And we're in the process of talking about implementation details. But the requirement has to be met and the staff has to be able to verify that.

MEMBER KRESS: Yes. So with the bounding and the source term, they really don't have to -- and they don't have a design -- they don't have to evaluate Chapter 15, design basis accidents; they just say this bounding source term would cover all those?

MEMBER SIEBER: I would think that when you got to the operating license stage, you would have to define what the design basis accidents are.

MEMBER KRESS: That's at this stage I'm sure you --

MR. JENKINS: Well, the main thing --

MEMBER KRESS: Well, you would if it were certain.

MEMBER SIEBER: Well, some folks says that maybe the concept of design basis accidents is outmoded. But I don't think it is because you can't do the dose-to-the-public estimate without knowing the response of the plant in the so-called postulated design basis accident.

MR. JENKINS: Well, we really will not know what kind of reactor designs that that particular applicant is seeking. They are seeking that if the site parameters -- that the future design meets those parameters, then in fact they get site approval. And so we're operating based on the protocol that we will look at the PPEs in terms of its environmental and safety impacts, assuming that they are in fact true.

MEMBER KRESS: My impression of PPEs was that they took various reactor types --

MR. JENKINS: Right.

MEMBER KRESS: -- like LWRs, LMFBRs, the gas-cooled reactors and so forth and looked at all these characteristic things that you'll need to do an

environmental impact or to design to meet the environmental conditions or safety. And they just took the worst part of each one of these types of reactors and said, "This is our envelope," and therefore they could choose, easily choose any one of those designs because it's covered and it's bounded by the value they chose or they could choose some other design as long as they could show that it's within those bounds.

MR. JENKINS: In the PPE worksheet, there is a range of designs, and that's provided for the staff's information. The applicant could -- you could select that from that worksheet or select any --

MEMBER KRESS: As long as it's within the bounds of the envelope.

MR. JENKINS: Right. Right. And so the process is that they look at what's currently out there in terms of reactor designs, and they select the design parameter and try to envelope what they are interested in in the future building. They also are going to add margin in that parameter to account for business uncertainties and any uncertainties that might exist, because they are getting this information from the vendor and that might change.

So the particular parameter will be

reviewed by the staff for the environmental and the safety impacts. Primarily, they are focused on the environmental impacts for the selection of the PPE.

MEMBER KRESS: That was my judgment also, yes.

MR. JENKINS: Yes.

MEMBER KRESS: It was for environmental impact purposes, yes.

MR. JENKINS: Right.

MEMBER KRESS: Okay.

MEMBER LEITCH: Could we talk for a minute about the heat rejected to the river, or the pond? Is that a parameter that is specified in the PPE?

MR. JENKINS: The PPE worksheet includes parameters like that. It talks about heat rejection from coolant tower, but we really don't know what that would be at this point, because we don't have an application in front of us. That's the -- they presumably would be trying to address the environmental impact associated with that. We would also have to look at the safety side of any PPE value.

MEMBER LEITCH: Does the NRC -- are there other agencies involved in the approval of the heat rejected to the river?

MR. JENKINS: I think on the environmental

side, the staff works with EPA and there's the state -- we have a Memorandum of Understanding with states' environmental agencies.

MEMBER LEITCH: I guess I don't really understand that answer. In other words, my question is can you approve an early site permit for a certain heat rejection to the river? Is that within the scope of the NRC to approve that or is that beyond the scope of NRC or are you just silent on heat rejected to the river approval?

MR. JENKINS: I'm going to go to my colleague, Jerry Wilson.

MR. WILSON: I think what you're referring to is something such as a discharge permit, which is issued from the EPA. And our permitting on early site permit is along the lines is this suitable for a power plant? But that permit process does not include actions taken by other agencies. So if someone actually wanted to build a plant at that particular site, referenced an early site permit issued by the NRC, they would still have to get things like discharge permits from the EPA. That's not something that the NRC would do as part of this review.

MEMBER LEITCH: Okay. So the suitability then is suitability to site a reactor on that site --

MR. JENKINS: That's correct.

MEMBER LEITCH: -- not necessarily suitability to build a turbo generator with heat rejected to the river? That's beyond the scope of --

MR. WILSON: Well, we've made a determination from the perspective of the site safety characteristics and the environmental impacts, but we haven't authorized construction. That's a separate action from the NRC, and also that particular entity that's planning to build the plant would also have to get appropriate permits and approvals from other agencies that have responsibilities, such as discharge permits.

MEMBER RANSOM: That includes --

MEMBER LEITCH: So the approval of the early site permit then does not imply --

MR. WILSON: That they were going to be able to get those permits, that's correct.

MEMBER RANSOM: That includes non-federal permits, including state and locals.

MR. WILSON: Yes.

MR. JENKINS: Right. And when we asked the question on that, the applicants indicated that they would pursue that separately.

Okay. The next bullet talks about that

ESP applicants are expected to evaluate the severe accident impacts, but the severe accident mitigation alternatives would be deferred to the COL stage if the information is not available at the ESP stage.

VICE CHAIRMAN WALLIS: I'm not sure how they do that. I mean there are some designs that claim they cannot have severe accidents. How do you then evaluate impact of that?

MR. JENKINS: Well, this ESP applicant would not even identify the designs that you're talking about. Severe accidents as an issue has to be addressed, and if they are considering any design that involves severe accidents, they would have to address it.

VICE CHAIRMAN WALLIS: I don't know how they address if they don't --

MEMBER KRESS: Well, what I would do, probably, if I were them, is that I would use the same source terms that we know about for LWRs. And I would do it based --

VICE CHAIRMAN WALLIS: There's a bounding thing that has sort of --

MEMBER KRESS: Yes, and it's bounding. And then I would say my design is going to be better than -- as good as or better than that. And I can

show that it meets all the dose acceptance criteria. I think that's the basis of the plant parameter envelope concept is you kind of using a bounding value, and when you get ready to pick the design you stay within that --

MR. JENKINS: We're still in the process of talking with industry on the implementation, but it's clear in terms of a regulatory position it has to be addressed.

MEMBER RANSOM: Doesn't that, Tom, lead to -- I can't think of another process, but that process leads to elimination of a lot of sites --

MEMBER KRESS: It could.

MEMBER RANSOM: -- that otherwise could be used if --

MEMBER KRESS: It could if it's a new particular that has never been approved before, but I think if you selected a site that already has a plant on it, you're almost guaranteed that you're going to fit the rules.

MEMBER RANSOM: I was thinking new sites.

MEMBER KRESS: Yes.

MEMBER RANSOM: If you use a bounding approach using a light water reactor source term, you're going to be out in the country. You're not

going to be able to --

PARTICIPANT: Well, presumably, you could use any source term you wanted as long as your plant would then meet --

MEMBER RANSOM: Right.

PARTICIPANT: -- that source term.

MEMBER RANSOM: But if you say, "I want a site at Site x," which is near a city, let's say, and it's a new site, and I use the light water reactor source terms, you're not going to be -- you won't pass.

MEMBER KRESS: Maybe not and rightly so. They shouldn't choose a site if it wasn't going to pass.

MEMBER RANSOM: If they can't use that approach, if it's a new site near a city.

MEMBER KRESS: I think that's probably the way the systems will work, yes. If I were going to be one of the utilities, I choose a site that already had a plant on it if it were big enough to put another plant it.

MEMBER RANSOM: Obviously, but I think the ultimate --

MEMBER KRESS: That's because you've got all that information already developed that you can

make use of, and you can almost guarantee that you're going to pass the 10 CFR 100 type things. But, you know, that's up to them. If they want to pick a new site, they can, but they have a little more problem in showing -- they've got more work to do if they're going to pick a new site, I think.

CHAIRMAN BONACA: If you wanted to get an ESP in New York City, it would be the least of their problems.

MEMBER KRESS: Yes. It's not going to pass.

CHAIRMAN BONACA: It's a dog fight.

MEMBER RANSOM: Well, you might --

CHAIRMAN BONACA: No, I understand.

MEMBER RANSOM: -- be able to use a very advanced reactor that has such robust features that nothing comes out.

CHAIRMAN BONACA: That's why you want to make a case probably once you have the design.

MEMBER KRESS: That's problematic.

MEMBER RANSOM: No, but I'm just saying is you could use the bounding approach if you wanted to take an aggressive position like that.

MEMBER KRESS: That's right. But I don't think anybody's going to do that.

MEMBER RANSOM: Gen 4 plans to talk about it.

MEMBER KRESS: Yes. That's going to be a debate we'll enter into one of these days.

MEMBER POWERS: Dr. Kress, you've indicated that you think that an LWR source term is, in some sense, bounding. But in other context, you have raised the possibility that the qualitative features of an LWR source term might change because of different environments, ambient conditions. And I'm wondering how do those two square?

MEMBER KRESS: Well, when I said I thought it would be bounding, I had definitely in mind design basis accidents and design basis space.

MEMBER POWERS: But I think severe accidents --

MEMBER KRESS: But I think you would then -- when they come to the point of choosing some real design and real reactor type, the staff and the applicant is going to have to face up as to what their design basis accidents are going to be. And at that point, it may very well turn out that this wasn't bounding if they chose a design basis accident that somehow developed a higher source term. Then we've got a problem. The problem is that they won't be able

to actually build the thing there if they choose that type of reactor.

MEMBER POWERS: It seems to me that the bulletin addresses the issue of severe accidents, which I think ipso facto mean beyond design basis.

MEMBER KRESS: Yes. But that had to do with just SAMDAs, severe accident alternatives.

MR. JENKINS: Right, which require specific design information.

MEMBER KRESS: Yes.

MR. JENKINS: Okay. The last bullet --

MEMBER POWERS: Well, I'm still struggling here.

MR. JENKINS: Okay.

MEMBER KRESS: Well, I've been struggling with this too.

MEMBER POWERS: I mean is there a rule of rationality here that a gas-cooled reactor can't come in and claim that there are no accidents that will get air into the system?

MEMBER KRESS: I think the rationality would be that that's not within their design basis envelope because of frequency considerations probably, low frequency. We have the NEI --

CHAIRMAN BONACA: NEI would like to make

a statement.

MEMBER KRESS: -- who would like to make some comments here, which may be helpful.

MR. BELL: Thank you. Good morning. I'm Russell Bell with NEI. I Chair the Early Site Permit Task Force, and I've got two our applicant members here with me. I commend the ACRS on the excellent questions that they're asking of Renaldo. On some of these dose consequences in the severe accident area, the discussion is along the lines that we're preparing to propose to the NRC, and that is that a generic approach to severe accident impacts could be used to meet the expectation of the NRC that this issue be addressed at the early site permit stage even in the absence of actual design information. So that is the path we're on.

It was NUREG-1150 that was one example of a generic analysis of severe accidents. And I think we would take credit for the Commission policy that any future reactor would be expected to have superior severe accident performance than those evaluated under 1150. So that's an outline of the approach we plan to more fully discuss with the staff shortly.

On design basis dose, a little different situation. Early site permit is about the site and

not about the design, and we continually need to even remind ourselves of that as we talk as a Task Force. So we tumbled early to the reality that the only aspect of dose consequence analyses that is determined by the site of the X/Q. And so we proposed an approach to the staff along the lines I think Dr. Kress was alluding to earlier whereby NRC would -- we propose they would review and approve the X/Q, particularly that site in the ESP, but that would recognize that the actual dose consequence analyses would be a matter addressed in design certifications or at the combined license stage when you had an actual plant design. And only at that time when you have the actual site, including the X/Q, and the actual design dose consequence -- design basis dose consequences can you actually determine that the Part 100 criteria is met.

On this we and the staff have disagreed. We proposed that on December 20. Their response back to us indicated that they would expect to see dose consequence analyses in the early site permit application. We continue to disagree but to facilitate the pilot ESP applicants going forward, we have proposed including a bounding design basis accident dose consequence in the ESP, couple that with

the site X/Q.

MEMBER KRESS: That means you have to have a source term.

MR. BELL: That's right, that's right. We'd probably choose one of the certified designs or one of the ones going through certification, because those are the designs we've got complete information on. Now, in our view, at best this would demonstrate that the site can meet Part 100 requirements, not that it does. And so that's the nature of our disagreement with the staff. But we are on a success path in terms of moving the pilot applicants forward, because we think that there is a bounding approach here that is workable. We'll work out the details of that implementation with the staff. We're not convinced it's the optimal or the necessary one.

MEMBER KRESS: That X/Q is actually a site characteristic of this.

MR. BELL: That's right.

MEMBER KRESS: I mean it's already determined by the site itself.

MR. BELL: It is and like other site characteristics, hydrology, seismology, that would be firmly and thoroughly established in the early site permit approved by the NRC. I hope that helps.

MR. JENKINS: Just to be clear, the gentleman stated that their position would not assure that the site meets Part 100 until the COL stage. And the current regulations say, Part 52 Subpart A, that the site must meet Part 100. So there's no mechanism to allow the staff to come to its findings --

MEMBER KRESS: So in order to conform with the site permitting rules, you'd have to have some sort of --

MR. JENKINS: Exactly.

MEMBER KRESS: -- a demonstration.

PARTICIPANT: At least a bounding number.

MR. JENKINS: Right. And that's the reason why our letter back recommended the bounding PPE and associated design information. And we also concluded that the siting cannot be completely separated from the design. This portion of the design parameters must be specified in some way so that you can perform the radiological dose consequence evaluations and the staff can verify them.

MEMBER KRESS: That seems a little strange to me, and I'll tell you why. I've got a site that has already developed its wind characteristics and its distance population characteristics, and it's already got a site exclusion area boundary to it. All I have

to do to show that I meet the dose criteria is pick a source term that gives you that value or below it.

MR. JENKINS: Right. Right.

MEMBER KRESS: And so I mean it --

MR. JENKINS: Right. And we agree --

MEMBER KRESS: -- just seems like simply saying I will pick a source term that meets that, and I will have a design that has that source term or less. I mean is that -- it just seems strange that you're requiring a calculation or something to be done to show it, because its' --

MR. JENKINS: Well, that's what the regulations say. The regulation points us to it.

MEMBER KRESS: Yes. It still seems strange to me, though, because it seems like I would have liked the idea of just saying, "Well, here's the X/Q and we'll make sure when we put the plant down there that the dose actually meets."

MR. WILSON: Jerry Wilson, NRR. In a way, though, it's no different than any other issue that we evaluate in the early site permit. You can't determine the suitability of the site without some understanding of the types of plants that are being considered by the applicant. You need to know about the plan to look at the safety characteristics and the

environmental impacts.

And so what we're asking for is a demonstration, and, yes, they're going to have to assume a source term to do that, but you have to make other assumptions about the types of plants that you may be planning to put there in order to do this review. You can't separate a site review from a design review completely. You have to have some understanding of what's being considered by the applicant to do it, and we need to see some sort of a demonstration that that site is suitable for those types of plants you're considering.

MR. JENKINS: In fact, we went back to the last rulemaking, this is SECY 96-118, which pertained to amending Parts 50, 52, 100, and it issued the Appendix S to Part 50. And the discussion was quite extensive on the Commission. It's essentially knowing what's the radiological consequences of the new facility before you give the approval for that facility, the site approval for that facility.

MEMBER KRESS: Okay.

MR. JENKINS: Now, the --

MEMBER KRESS: That last bullet.

MR. JENKINS: Yes.

MEMBER KRESS: Isn't that a requirement

for an environmental impact statement?

MR. JENKINS: Yes, it is.

MEMBER KRESS: Do you have to do this?

MR. JENKINS: Yes. The question is has to do with, well, what does that review encompass? There's an update since that bullet was developed. The staff has issued a response. Basically, we have said that you would like to limit the scope of the review. We basically agree that you can, but you have to justify why you're limiting the scope of the review.

MEMBER KRESS: And then what -- is there any guidance on what --

MR. JENKINS: There's guidance contained in the --

MEMBER KRESS: -- constitutes appropriate justification?

MR. JENKINS: Well, the applicant would have to develop the justification for that.

MEMBER KRESS: Yes. They have to figure out what the --

MR. JENKINS: Right.

MEMBER KRESS: I mean is it simply the fact that it would be a lot of cheaper for us at this site than any other? Is that a justification?

MR. JENKINS: Well, and I guess I would defer to the Environmental staff. There are a number of guidance in the environmental standard review plan, which is NUREG-1555 and that's referenced in the ESP review standard. And that basically steps through the applicant's for how to do that review. The question -- this is a subject of apparently a rulemaking and that's another wrinkle to this in that the staff is going through a technical review stage now. We had a public meeting in January to get public comments on this particular subject.

MEMBER KRESS: This particular Committee normally concerns itself with safety and --

MR. JENKINS: Right.

MEMBER KRESS: -- and not environmental impacts, so we're a little bit fuzzy on some of the new rules relating to environmental impacts.

MR. JENKINS: Next slide. Some of the activities that the staff is and has been engaged in includes local public meetings. We had a public at Grand Gulf, that vicinity, November 14 of last year. Clinton, we're planning to have a public meeting in that general vicinity March 20. And North Anna on April 1.

MEMBER KRESS: So Grand Gulf is in

Alabama?

MR. JENKINS: No, it's in Mississippi.

MEMBER KRESS: Mississippi. I knew it was down there somewhere.

MR. JENKINS: So we would hand out brochures like this one and other brochures to explain to the public the scope of our review.

MEMBER KRESS: Didn't you have a big turnout at that November 14 meeting?

MR. JENKINS: Well, big is relative to the local community that you're involved in. And Port Gibson, Mississippi is a small population. We had roughly 100 people show up.

MEMBER KRESS: I wouldn't call that a big turnout.

MR. JENKINS: Well, it all depends on how you view it.

MEMBER KRESS: Well, were they generally in favor of this or --

MR. JENKINS: We got positive feedback from those who attended regarding the staff's presentation. And, of course, each community has their own view as to the existing facility, and now you're going to add another facility or you are making plans to seek site approval for another facility.

And, generally, for Grand Gulf, the population is all in favor of it.

MEMBER KRESS: Oh, that's interesting.

MR. JENKINS: That's the general sense that we get.

MEMBER POWERS: Dr. Kress, let me ask a question.

MEMBER KRESS: Okay.

MEMBER POWERS: Suppose that I retired from the ACRS and went to work for the Nuclear Control Institute, came to the hearing here and said the bounding source term that you have to use in the absence of any information about the plant is, one, the bounding source term that's been measured, and I insist that you use the source term from Chernobyl. How do you respond to me?

MEMBER KRESS: I guess I would fall back on the concept that Chernobyl would not be in my design basis. I would fall back on that card and say -- you know, there would be a big debate over whether that sort of thing ought to be in the design basis or not, and we've traditionally excluded that type of accident from the design basis because of the low probability of occurrence.

MEMBER POWERS: No. You can't fall back

on -- I mean I chose it deliberately. You can't fall back on occurrence that's occurred, and any kind of Bayesian Update --

MEMBER KRESS: It wasn't the kind of plant I'm going to build on there. So the probability of that kind of accident for the type of plant I'm going to build there is low. And I can say, well, it's so low that the probability times the consequences of it are still within an acceptable range and I don't have to deal with it in design basis space simply because it isn't a real probability. That would be the argument I would use. Now, I don't know how valid that argument is. It's basically the one that's always used in design basis concept.

MEMBER SIEBER: It would seem to me, though, that Part 100 that drives all this is not risk-informed; it's deterministic.

MEMBER KRESS: I think it's --

MEMBER SIEBER: It's a risk argument with probabilities of occurrence that probably wouldn't apply.

MEMBER KRESS: Part 100 can be said to be risk-informed because you have to show that for a whole range of design basis accidents that you meet the dose criteria and that and that these design basis

accidents are chosen -- now this is a rationale, it's not really true -- are chosen so that in a real risk base you will meet some sort of risk acceptance criteria if you conform to the design basis concept. So it could be said to be risk-informed if you took that view.

MEMBER SIEBER: Well, I think you'd have to make the argument as you already have in order to be able to make that statement. But as you read it verbatim, it's not risk-informed.

MEMBER KRESS: Well, then if then they choose to, say, put a HTGR on the site, then we're going to have to face up to what are the design basis accidents for this particular kind of plant?

MEMBER SIEBER: That's right.

MEMBER KRESS: And that's going to be another debate all together. And it should be risk-informed somewhat.

MEMBER SIEBER: I would --

MEMBER POWERS: I get rid of the idea of a design basis accidents.

MEMBER KRESS: Well, that might be one way to do it. I've got some sympathy for that view. But, you know, we're -- in our regulations, we deal with design basis phase almost exclusively, because we

don't have a risk-informed regulatory system alternative. So at the moment, we have to think in those terms, and I think when they choose a reactor that's not like an LWR, I think there will be a debate as to what the design basis accidents actually are.

MR. JENKINS: I think it's important to remember that at this particular point in time the staff will not know what specific reactor design that they are seeking. It's a 20-year permit, so we do not know what types of designs that may come along that fits within the envelope of the PPE and therefore also the site characteristics are compatible. So we do not know that the Commission will be giving site approval for this future facility. And the COL, and I'm sure Jerry Wilson would agree, that's where we would bring together the design and referencing the ESP and taking into consideration some of the other features that are necessary for the actual construction of the plant.

MEMBER RANSOM: Renaldo, could the applicant use an early site permit to ultimately build ten small, say, pebble bed machines on that site? I mean that's been proposed.

MR. JENKINS: If the permit --

MEMBER RANSOM: Within the scope of the ESP?

MR. JENKINS: If the permit in fact allows it.

MEMBER RANSOM: In other words, we'd have to disclose the fact that he's actually thinking of up to ten modules.

MEMBER KRESS: I think you disclose his total power.

MEMBER RANSOM: Right. You would disclose the total power in terms of megawatts, and the process, the review process will unearth certain information that will be part of the ESP, the permit itself. Our intent is, for example, that all of the PPE values would be specifically identified as part of the permit, as an attachment, for example. So that any future design would have to fall within not only the site parameters that are typically associated with the site characteristics but also the PPE values that the applicant is telling us is bounding. And the staff would evaluate the environmental impacts and the safety impacts associated with the application.

MEMBER RANSOM: Well, I chose that example carefully to get to my next question.

MR. JENKINS: Okay.

MEMBER RANSOM: Which is given the fact that the applicant discloses that, that he's going to

use multiple modules, maybe up to ten, would you then require him to take simultaneous accidents in all of them or just would he be allowed to take an accident only module at a time?

MR. JENKINS: The areas that we've talked about so far in terms of the radiological dose consequence evaluation and severe accidents would be the only two areas that we would be exploring. So specific design --

MEMBER RANSOM: Well, I'm getting to the source term question.

MR. JENKINS: Okay.

MEMBER RANSOM: So if you say, well, he's only has to take an accident in order to pick a bounding source term in one plant, one module, maybe 100-megawatt module, that's a different story than having a source term that's based upon an accident sequence, which involves a common mode failure and which results in multiple cores being damaged simultaneously, which would change the source term with a constant X/Q. You get a different result. So I'm trying to find out -- this is all new to me too. I'm trying to find out how you handle something like that.

MR. WILSON: This is Jerry Wilson, NRR.

That type of what I would consider part of the design review we do either in design certification review if there was a multimodule design proposed or in the application to build the plant, and we would make that determination as whether or not there were common mode failures to lead us to conclude that you could have more than one plant with a design basis discharge.

But for the purposes of early site permit, I don't believe we would do that. The applicant's going to propose some sort of a bounding release, and we'll evaluate the site from that perspective. And then it's up to the subsequent applicant to demonstrate that that release was bounding for their particular design or designs. And if not, then they wouldn't be able to reference that applicant or they'd have to do something additionally to demonstrate that site was acceptable. So from that perspective, the applicant is taking the risk. We're going to assume that that source term that he's specifying will be bounding for that subsequent design or designs that they propose to site there.

MEMBER KRESS: That's why I thought it would be just sufficient to say, "We will meet the regulations." It's silly to say, "I'm going to have this bounding source term and then --"

MR. WILSON: Well, Mr. Kress, if you want to submit an application on a postcard and say you're going to meet the regulations, you can try, but probably won't get passed me.

MEMBER KRESS: No. I know you have to have these parameters, though, for all the environmental impact and stay within them. I don't think there's any equivalent to it for the environmental impact, but for this particular aspect it seems like, "Well, we'll just stay within the -- we'll meet 10 CFR 100, that's our commitment."

MR. WILSON: Well, traditionally, we have expected applicants to do a demonstration to show us how they're going to meet the regulations.

MEMBER KRESS: Well, that's the X/Q and we'll say, "Well, we'll make our source term such that it meets the regulation." That's basically all they're going to do anyway. They'll work backwards. They'll take the X/Q got for this site and want to get approved, and then they'll calculate the source term it takes for that X/Q to meet the regulations and say, "We'll stay within that source term."

MR. WILSON: I could do that for all the regulations. I could do that for all the regulations and all the environmental impacts.

MEMBER KRESS: Well, that's basically what the parameter envelope does for you.

VICE CHAIRMAN WALLIS: This X/Q is weather-related. It's dispersal and not --

MEMBER KRESS: Yes, it's dispersal.

VICE CHAIRMAN WALLIS: So you're assuming that climate is somehow invariant over 20 years?

MEMBER KRESS: Well, no. They use bounding values for that.

VICE CHAIRMAN WALLIS: How do you know -- I mean the Gulf stream reverses in ten years in time or something and you have to reevaluate the --

MEMBER RANSOM: I think the answer to your question, Dr. Wallis, is, yes, that using X/Q assumes that climate is constant, it doesn't change dramatically like true causes like the one you just mentioned.

MEMBER SIEBER: It's also assumes there's no hills or valleys.

MEMBER KRESS: No, it's actually based on measurements at the site.

MEMBER SIEBER: That's right, but --

MEMBER POWERS: Or you could build an artificial hill and change your X/Q.

MEMBER SIEBER: Absolutely.

MEMBER KRESS: Or buildings.

MEMBER POWERS: Or level that hill. Move the hill.

MEMBER KRESS: It's possible. Please continue.

MR. JENKINS: All right. We also plan to have a public meeting here in Rockville to get feedback from the public on May 14, and the staff will be continuing to refine the nominal ESP review and decision timeline. That's the next slide that talks about --

MEMBER POWERS: Incidentally, Dr. Kress, in light of your extreme interest in this issue, I certainly think I would vote with the Committee to support your travel to the Clinton meeting.

MEMBER KRESS: I was just about to write that one down on my list here as something I may want to go to.

MR. JENKINS: As the slide indicates, we are projecting 33 months from the receipt of the application to the Commission decision, and these are -- the milestones are bounding in nature. If we get it completed earlier, then we move on to the next milestone.

And just to bring your attention, the

safety review will be in parallel, similar to license renewal, but will be conducted in parallel by the staff, where you -- starting from the acceptance review, day 60, you would have both the safety RAIs -- the staff would be looking to develop RAIs with respect to safety and also RAIs with respect to the environmental impact review. And as we move along the ACRS, this Committee would be involved basically from day 43, where the SER with open items would be issued, and we would be bringing the final safety evaluation back to this committee for review. Next slide.

MEMBER RANSOM: Well, hold it a minute. You have an 840 and ASLB initial decision? That's an assumption that there will be a public hearing on this?

MR. JENKINS: Yes.

MEMBER RANSOM: Or is that a required?

MR. JENKINS: We're assuming 12 months for the hearing.

MEMBER RANSOM: But is it required is my point?

MR. JENKINS: Yes, it's a mandatory hearing.

MEMBER RANSOM: Thank you.

MR. JENKINS: Okay. Next slide.

VICE CHAIRMAN WALLIS: You're assuming that the ACRS doesn't have any problems with this thing.

MR. JENKINS: we're assuming we are receiving a high quality application from the applicant.

VICE CHAIRMAN WALLIS: They're going to miss you. They'll just see you a couple of days after the ACRS review.

MR. JENKINS: As this slide indicates, the purpose of the review standard is to provide guidance to the staff and information to stakeholders on the review of an ESP application. We used existing guidance to the extent possible. That was our starting point with the development of the review standard. While we tried to be consistent with the power uprate review standard and license renewal guidance, there were some points in which we had to depart due to different format and content issues. Next slide.

The draft ESP review standard was issue for our interim use and public comment in December of 2002. And as I said before, the comment period ends at the end of this month, March 31, 2003. We provided the Committee with copies of this document, and we're

now in the process of developing additional guidance and quality assurance, the radiological dose accident analysis, that's what that term means, and physical security. And we're on course to release that later this month, and we will provide copies to the Committee of these three new sections that will go out for public comment. Next slide.

As part of the development approach, the staff looked at NUREG-0800 1981, that's the standard review plan for nuclear plants, we looked at NUREG-1555 1999, that's the environmental standard review plan, regulatory guides, information notices and other regulatory documents, such as NUREGs. Next slide.

The primary review branch was asked to markup their assigned sections in NUREG-0800 and NUREG-1555 to basically achieve two results. One is to clearly show what's needed and what's not needed in the ESP stage. And we wanted to revise existing guidance and bring some of these sections up to date since the documents we were -- those document 1981, clearly there were references that were out of date. Next slide.

As a result of these markups, the document essentially applies mainly to Chapter 2, NUREG-0800 having to do with site characteristics. Certain

sections were found not to be needed for an ESP review since they were addressed in other sections. The NUREG-0800 is basically a holistic document reflecting both the siting review, the design, construction and operations that the staff would engage in under the old Part 50. Additional sections were found to be applicable -- the QA, the security, some of the changes that have been going on in the security area. The amendment has this and examples being the site missiles and aircraft hazards. Emergency planning, that's the new guidance. And as we mentioned before, the accident analysis will be called Section 15.0 and that really deals with meeting 10 CFR 50.34(a)(1) on what we were talking before on radiological dose consequence evaluation. Next slide.

So markups were made with the NUREG-0800 sections, and we attended those sections to the review standard. We wanted the review standard to be a stand-alone document. Although we were using NUREG-0800, 0800 remains the same and does not constitute any revisions to NUREG-0800.

VICE CHAIRMAN WALLIS: When are you guys going to -- you've only had one public meeting so far?

MR. JENKINS: We've had one local public meeting?

VICE CHAIRMAN WALLIS: Do you find there's a concern about human-caused events, let's say? I mean I noticed in this document that we got here there's something about dam failures, and it says something about if you can show there isn't likely to be an earthquake, there's going to be challenge to the dam to do various things. I would think that there might be members of the public who said if you're going to build this reactor downstream of a dam, how about man-caused failures of that dam? I'm not saying this is likely to happen, but I can see that the public might be concerned.

MR. JENKINS: Well, one of the purposes of our going out to the local public near the site is to hear comments like that if in fact that's the case. As far as Grand Gulf, the local population was very supportive of the idea of a new facility, and the security, for example, is one of those things that's up in most people's minds, so we fully expect to and plan to address any questions that might come up that we think the public would raise in these meetings. Next slide.

VICE CHAIRMAN WALLIS: So this is something which would be in your decision-making process but not specified in your standard.

MR. JENKINS: No. The purpose of the public meetings is to provide public outreach consistent with the NRC's strategic goal.

VICE CHAIRMAN WALLIS: If it were a public outcry as well as outreach about something, then you'd have to take that into consideration, even if the physical problem that the public was crying out about was not in your review standard.

MR. JENKINS: Well, our current protocols call for feedback -- taking feedback any time we have a public meeting, and we listen to what the public says on particular issues. However, we have to follow the applicable regulations and the review guidance that we've put out.

So the results of this markup indicates that few changes were needed to NUREG-1555, as you were saying, that this is the environmental area. It's fairly recent. And the review standard just basically indicates what's applicable. The EIS that the staff would develop is a snapshot in time. The COL regulations call for an environmental assessment later based on new information or things that were not addressed at the ESP stage. Next slide.

So the review standard document contains, as you have in front of you, the process guidance;

that is, how the staff is going to go through the steps once we receive the application, as well as some of the internal procedures that are applicable. Attachment 1 is that review process flow chart. Attachment 2 is the applicability table for the safety evaluation, followed by the marked up NUREG-0800 sections. Attachment 3 is the applicability table for the environmental impact statement that the staff would develop. And we took a stab at developing a template, a safety evaluation report template. Next slide.

Just some discussion on some of the issues that we were faced with in developing this document. The 10 CFR Part 52 is fairly new in the sense that there's not much precedent and it's not specific. And there's the issue of where do you draw the line between the design information and what would be the siting type information to be verified? And so there's questions of how much the staff needs to look at and the difficulty in terms of the gray areas between the ESP and the COL. And so the staff is in the process of sorting that out. The industry has formed the COL Task Force, and so we've already started meeting on issues related to COL.

The review standard, particularly since we

had not received the NEI position with respect to the PPE, the use of PPE, did not allow us to address PPE as a method. Currently, we do plan to revise the document in the final version to include additional flexibility consistent with our position. A letter was sent to NEI. So we will accept PPE values as surrogate design information. Next slide.

Other issues that were, I guess, central to the development of the document had to do with the QA and Appendix B. We had talked about that as an issue we had with industry. Part 52 does not require Appendix B but the finality of the ESP determination implies that the staff has looked at the ESP information and essentially we are, when we grant the ESP, stating that there's no problems from a quality point of view. So this new section is being developed to address QA for the ESP application.

On radiation protection, if the applicant and license is the same, the licensee will handle the compliance of 10 CFR Part 20, and the applicant will discuss the impact on the construction workers in the environmental report. If the applicant and the licensee is different, then the licensee, once again, will have to ensure that Part 20 is complied with, but the applicant would have to -- excuse me, if the

applicant and the licensee is the same, the licensee takes on the responsibility of addressing both Part 20 and the impacts on the construction workers. If it's different, then the licensee addresses only the Part 20 compliance, and the applicant discusses the impact on the construction workers in the environmental report. Sorry. Next slide.

There was a question about coverage for subsurface investigation. Staff would like to make sure that there is adequate -- reasonable assurance that the actual site conditions revealed during excavation will be consistent with the model used for the ESP and that the license conditions requiring reporting of information has sufficient implication for public health and safety.

So as the next slide shows, if there is inadequate meteorological data, then the staff would basically deny the application.

VICE CHAIRMAN WALLIS: You had a superfluous "not" in that. You don't need that word, "not," and that makes it nonsensical. If inadequate data are not available.

MR. JENKINS: Right. If --

VICE CHAIRMAN WALLIS: If adequate data are not available or inadequate data are available.

You don't need two negatives.

MR. JENKINS: Right. If there's an inadequate meteorological data --

VICE CHAIRMAN WALLIS: You're not looking for inadequate data.

MR. JENKINS: No, we're not looking for it. Only if we find it.

VICE CHAIRMAN WALLIS: We've seen some in the past in other context.

MR. JENKINS: Thank you.

MEMBER RANSOM: Some of the kinds of inadequate data we've seen is not.

MR. JENKINS: Thank you for that clarification. Next slide.

MEMBER KRESS: You get lots of really deep advice from this Committee.

VICE CHAIRMAN WALLIS: This is quality assurance.

MR. JENKINS: The next step for the review standard is to incorporate the public comments, any comments that this Committee has to finish a new draft by June 2003 and incorporate any lessons learned, any information we can obtain from the acceptance review of the initial ESP application. We plan to issue the final, that is Rev. 0 of the document by the end of

this year.

VICE CHAIRMAN WALLIS: So you wait until you've got experience with these initial applications before you issue the document?

MR. JENKINS: Well, the acceptance review will allow us to make sure that in terms of scoping that we make sure that there's nothing that's --

VICE CHAIRMAN WALLIS: So you would use the draft document in your acceptance review and then modify it when you find that it didn't work out in some aspects or something.

MR. JENKINS: Well, if there's additional information that we have to take in consideration --

VICE CHAIRMAN WALLIS: You'll learn from that.

MR. JENKINS: -- we'll learn from that.

MEMBER KRESS: Now, if I'm a utility and I've got a early site permit already granted to me and I come in later and tell the NRC that I'm going to build an AP-600 on there and it's already certified.

MR. JENKINS: Right.

MEMBER KRESS: What do I have to do then?

MR. JENKINS: The next step is if you have -- an AP-600 is a certified design.

MEMBER KRESS: Yes.

MR. JENKINS: And so you would reference that design and reference the ESP in your COL application.

MR. WILSON: Jerry Wilson, NRR. To add on to what Mr. Jenkins said, the certified designs all have postulated site parameters.

MEMBER KRESS: Yes. That's what I --

MR. WILSON: And so you'd have to compare the actual site characteristics to the postulated site parameters. And the ESP is going to have postulated design parameters, and you're going to have to compare the actual design characteristics to the design parameters.

MEMBER KRESS: That would be the --

MR. WILSON: And make sure all that matches up. And then in addition, of course, you're going to have to talk about the qualifications of that particular applicant to design and build a nuclear power plant and the acceptability of their programs to operate that plant.

MEMBER KRESS: Yes. That's standard.

MR. JENKINS: Yes.

MEMBER KRESS: Well, are there any comments or questions from the rest of the Committee? I guess then that we thank you very much. This has

been very informative, and I suspect we'll try to craft a letter for you. Turn it back to you, Mr. Chairman.

CHAIRMAN BONACA: Thank you. It is a unique achievement, the 500th meeting of the ACRS, I mean that we've finished this presentation half an hour ahead of time, so I commend you for that. And I think we want to reschedule --

MEMBER KRESS: It wasn't my fault.

CHAIRMAN BONACA: No. I think it was good. I think we got a lot of information. I think we learned it early. What I would propose we do we take a break now until 10:30 and then we resume the meeting at 10:30 and we just review DG-1119, which I believe is in good shape, and vote on it so that we can close that. And then at 10:45 we have the presentation from the staff regarding Fort Calhoun.

(Whereupon, the foregoing matter went off the record at 10:00 a.m. and went back on the record at 10:43 a.m.)

CHAIRMAN BONACA: Okay. Let's go back into session. We do have a briefing by the staff regarding license renewal under the new regime, which is the new GALL regime. And the staff came to us and explained that these changes will cause us to have to

look at the application in a different way, and they want to help us navigate the application which supposedly will be significantly different. So we thought that it would be helpful for the members to hear what is different and get some training.

MEMBER SIEBER: You may want to point out, though, Mr. Chairman, that there's a Cd-Rom in the book --

CHAIRMAN BONACA: Yes.

MEMBER SIEBER: -- that covers the latest four or five documents that we were given.

CHAIRMAN BONACA: Right. In the back of your handout for the meeting, you do have in fact a Cd-Rom which includes the improved license renewal guidance documents. So you may want to take it with you and use --

VICE CHAIRMAN WALLIS: Way in the back. Way in the back of this black book.

CHAIRMAN BONACA: With that, we have Mr. Burton here and he'll walk us through.

MR. BURTON: All right. Thank you, Dr. Bonaca. Good morning. As Dr. Bonaca, mentioned, I -- it was probably about five or six months ago that I met with Dr. Bonaca and Mr. Leitch. I guess I'm still maybe feeling the effects of back when we did the

Hatch review. I know that a number of you had some issues that we called navigational challenges, and so I'm very sensitive to that now. And as we started to go through Fort Calhoun, which is the first plant to fully implement the new GALL process, I thought that it would be helpful before you all actually start to focus your attention on it to try and give you a little tutorial about how these new applications are formatted and also a little bit about how the staff is actually reviewing these new GALL applications.

So that is why I am here today. And just very briefly, what I'm going to try and do is talk about the current status of the GALL plants, talk about the new application format, the new approach that the staff is using when they review these applications and how we're documenting our review results.

I'm probably going to -- at one point, I think I gave you probably a little bit too much information in here. When we get into -- I wanted to -- when I get to the point where I'm talking about what the reviewers are doing, it gets a little intense. I may skip a few of those slides.

But for now here's the current status. St. Lucie is going to be the last pre-GALL plant that

you all are going to see. You guys just went through with Peach Bottom, right after that is St. Lucie. That's the last pre-GALL plant. And, actually, St. Lucie actually incorporated a few aspects of GALL in their application, so you'll actually get sort of a transition into the new GALL regime. But starting with Fort Calhoun, everybody after that is going GALL 100 percent. And in fact, we have six plants that are currently in-house that the staff is reviewing: Fort Calhoun, Robinson, Ginna, Summer and Dresden/Quad Cities, which is a joint application. And I may have jumped the gun a little bit in even coming here in March, because you all won't actually be -- I won't actually be presenting the Fort Calhoun review results until your June meeting, and even then it's going to be a little while yet.

But in terms of the new format, I wanted to just tell you in general what's changing and what's not. Some things are changing very little; other things are changing significantly. In Section 2, there is a small change when you look at it visually, but it's fairly significant because what the change that we did make in Section 2 really ties a lot of stuff together.

And what we have in Section 2, we've added

in place of the normal information in the third column, which is usually component material or something to that effect, we've actually put in what I call links, and you'll get examples of that that actually link the information, the component in Section 2 with the aging management review results in Section 3.

In Section 3, Section 3 has changed significantly. There are three -- each system or structure group has up to three different tables. Each table has different columns, mean different things, you use them in different ways, and I'll go through that.

Section 4, which covers the time-limited aging analysis, that has not changed at all. So that will be just the way you're used to seeing it. And, again, Appendix B, which has the aging management programs, that has also changed significantly. And I'm going to go through some examples of that.

The first thing I wanted to show you was an example of the Section 2 tables. What you have normally seen -- the first two columns have stayed the same. Normally what you've seen in the last column is a list for each of the components, perhaps like what the material -- what material it was made of, that

kind of thing. We've eliminated that. Instead what we have are a series of what we call links, and this is going to come up again. And what these do is they actually link you to the appropriate Section 3 table.

One of the things that has happened in the new GALL regime is that in Section 3 what you were used to seeing was a series of tables, each table representing a system. In the new GALL regime, all of that is gone. Section 3 loses the individual system flavor. For instance, all of the components that make up what we call the reactor systems, the reactor vessel internals, the vessel itself, the RCS, all of the components in those three systems get rolled up into a series of reactor system tables. So you don't see the individual components for those systems.

Anyway, so in order for you to understand for each plant-specific component where it lies in that rolled up Section 3 table, we needed to create these links. And when you go to the Section 3 tables, you'll see that link again in the first column of the Section 3 table. So format-wise, that's how Section 2 has changed. Okay?

MEMBER POWERS: No, not okay.

MR. BURTON: Okay. Go ahead.

MEMBER POWERS: You mean now I have to go

to two sets of tables to get the same information I used to get from one?

MR. BURTON: Well, actually, what you had before was you still had Section 3 tables, but the individual -- each table was system-specific, and each system had their individual components there. So the same list of the components that you see here for the instrument air system, in Section 3 there was an instrument air table with these same components. So you didn't need to link them the way we're doing here, because they each sort of stood on their own.

MEMBER POWERS: So now if I'm interested in instrument air, I have to shuffle through two tables.

MR. BURTON: Yes.

MEMBER SIEBER: Yes.

MEMBER POWERS: Why? That's ridiculous. That is a stupid thing.

MR. BURTON: Let me -- well --

PARTICIPANT: Why don't you tell us how you really feel about it.

MEMBER POWERS: That's ridiculous that I'm going to look system by system. I'm not going to look -- you just make it impossible to look at.

MEMBER SIEBER: You're just old-fashioned,

you need two computers.

MR. BURTON: Well, if it helps, you're not alone in your thought from some people. There are people who feel very strongly about this, but --

MEMBER POWERS: Well, I'm kind of namby-pamby about it.

(Laughter.)

MR. BURTON: Oh, Okay.

PARTICIPANT: Could have fooled me.

MR. BURTON: Okay. But this is what we have.

MEMBER SIEBER: Those are not hyperlinks. Those are just links, right?

MR. BURTON: Yes. I believe that in the application itself they're hyperlinked.

MEMBER SIEBER: Okay.

VICE CHAIRMAN WALLIS: You mean you can click on them and move, go there?

MR. BURTON: Say again?

VICE CHAIRMAN WALLIS: What's a hyperlink? I don't know what that is.

MR. BURTON: Oh. You just click on it and you'll go to the appropriate thing.

MEMBER POWERS: Yes, but I can't come back.

VICE CHAIRMAN WALLIS: You can't come back.

MR. BURTON: You'd have to hit the back button.

VICE CHAIRMAN WALLIS: The back button, yes.

MR. BURTON: But it is set up, though -- to get to what you're saying, it is set up to start here and move through Section 3 to the aging management programs. To move backwards, you'll have to use the computer feature that -- hit the back button to go back.

VICE CHAIRMAN WALLIS: If you're using paper --

MR. BURTON: Say again?

VICE CHAIRMAN WALLIS: Using paper, you have to --

MR. BURTON: Yes. Now, paper, there's a lot of flipping back and forth.

MEMBER SIEBER: Let me ask another maybe not too brilliant question.

MR. BURTON: It's all right.

MEMBER SIEBER: You have accumulators as the first component type up there. I can think of accumulators in instrument air system, I can think of

accumulators that are in PWRs that put water in. So are there more than one listing for accumulators, because the aging management program for the air system is going to be a lot different than --

MR. BURTON: That's true. And to answer your question, although you're getting a little bit ahead of me, what each one of these links -- you notice there are like four links for this accumulator. Each link, when you follow it into the Section 3 table, is really tied to a specific material environment and aging effect combination -- one for each.

MEMBER SIEBER: Then you should end up in this table with a bunch of accumulators as opposed to one accumulator and a list of four or five references.

MR. BURTON: Well, let me -- I understand where you're going. Let me try and give you an example. Let's say we had a system that had air tanks as well as water tanks, both.

MEMBER SIEBER: Okay.

MR. BURTON: Now, obviously, it would be up to the individual applicant how they wanted to group those in these tables. If they were to do it under one component type, called accumulators, what you would see as you follow each of these links, one

of these links would lead you to a borated water, stainless steel --

MEMBER POWERS: Yes. So I get to explore each one of them till I find the one I want by random chance.

MEMBER SIEBER: Yes. That's sort of the way it is.

MR. BURTON: Well --

MEMBER SIEBER: And there's a grand opportunity to find the wrong aging management program.

MEMBER POWERS: Why do you do these things?

MR. BURTON: Well, let me give you a little bit of history, okay? Even the links were not originally envisioned. You all were briefed during the development of GALL and the demo project and all that. The links were not part of that. In fact, what was going to happen was that you were going to have this table, the Section 3 tables. As I explained to you, they were going to be set up with no link at all. And what happened was probably within --

MEMBER POWERS: Is this a deliberate attempt to obscure the information?

MR. BURTON: No, it's not deliberate.

It's not deliberate.

MEMBER POWERS: To render the review difficult?

MEMBER SIEBER: This is to make everything like the Hatch report.

(Laughter.)

MEMBER POWERS: Oh, we're trying to make the Hatch report look good. Now I understand.

MR. BURTON: The intent of developing the GALL program was really to try and take credit for existing programs. That's really what it was all about. Management of a lot of these components is very well-established, it's common across utilities. Why not sort of grant blanket acceptance of that, and then all they have to do is credit the thing?

MEMBER POWERS: Why don't they just send in a postcard, "Please extend my license," you stamp it, "yes," and send it back to them, and we can circumvent all this?

MR. BURTON: Well, I don't know that we'd have a lot of public confidence behind that.

MEMBER POWERS: Well, the public isn't going to be able to read what they got.

MR. BURTON: Well, and that's one of the reasons why I wanted to come in front of you, because

I knew that this was going to be controversial.

MEMBER SHACK: Before you remove the table --

MR. BURTON: Oh, sorry.

MEMBER SHACK: -- why don't I just get a single link for the accumulator in the instrument air system?

MR. BURTON: Because I --

MEMBER SHACK: And in some other system I get a link to the accumulator for the feedwater injection.

MR. BURTON: Oh, okay.

MEMBER SHACK: Since I've got a table for a system, why do I have links to every accumulator?

MR. BURTON: Okay. And, see, we haven't gotten to the Section 3 tables. What these links are are not to different accumulators, they are to different material environment aging effects.

MEMBER SIEBER: Right.

MR. BURTON: That's what you'll see here. Like, for the --

MEMBER SHACK: But everything is related to the accumulator in the instrument air system.

MR. BURTON: Yes. What materials, environments and aging effects that the accumulators

in the instrument air system are subject to. And each one of these links you to each aging effect and how it's managed. These are good questions. This is exactly what I expected to get. That's why I wanted to get in front of you.

MEMBER SHACK: So I have four aging effects for accumulators, and this essentially links me to the four aging effects? Is that what I have?

MR. BURTON: Yes. And in fact, you notice that some say 331, 332? The first three numbers, at least for Fort Calhoun, 331 means Table 3.3-1, Item 7, 3.3-1, Item 13. And you'll see that when I get to --

CHAIRMAN BONACA: The accumulators is easy because you don't have that many but talk about tubing. Does it mean for tubing that there are -- for all tubings in the plant there are only five environmental effects?

MEMBER SHACK: Instrument air. This is just for instrument air.

MEMBER RANSOM: That's the point I missed. That's the point I missed, and so go back to the beginning of the process. If I want to know about instrument air's accumulators, those four references there will tell me about the accumulators in instrument air operating in different environments.

MR. BURTON: Yes. And the aging effects --

MEMBER RANSOM: If I click on one, I won't end up in the RCS accumulators.

MR. BURTON: I certainly hope not. That would be bad. That would be very bad.

MEMBER SIEBER: So you actually have to read the title.

MEMBER RANSOM: You actually have to read it, actually, yes.

MR. BURTON: Yes.

MEMBER RANSOM: We haven't figured out how to avoid that.

MR. BURTON: Okay. So this is the first change in Section 2, okay? Good questions. This is exactly --

VICE CHAIRMAN WALLIS: But it would help if you had Table 3.3-1 whatever as well to look at, so you can see what's --

MR. BURTON: Actually, later on, I am going to run --

VICE CHAIRMAN WALLIS: What happens if it's not Table 3.3, it's Table 3.1, so it's about something else.

MR. BURTON: Well, I am going to explain

that too.

VICE CHAIRMAN WALLIS: Okay.

MR. BURTON: Give me one minute here.

MEMBER SIEBER: Before you take that off, under accumulators, does that mean the aging management review results links all of them apply or one of the list you have may apply?

MR. BURTON: No.

MEMBER SIEBER: All of them do.

MR. BURTON: All of them have some application for this component at Fort -- in this case, Fort Calhoun.

MEMBER SIEBER: Regardless of where that accumulator is in that system.

MR. BURTON: Right. Now, let me -- now that you've said that, I'm jumping the gun here, you may have a link that leads to a particular material environment combination, and ultimately the call may be that there's on aging effect that requires management, but it's still documented, okay?

MEMBER SIEBER: All right.

MEMBER SHACK: Jacks regardless, the only accumulator aging management I'm going to see is for the accumulator in the instrument air system.

MR. BURTON: In the instrument air system.

If there's an accumulator for another system, you'll see that accumulator in a different table for that system.

MEMBER SIEBER: But it could have that same link.

MR. BURTON: It could have that same link, that's true.

MEMBER SIEBER: If its environmental condition was the same.

MR. BURTON: In fact, you will see the same links repeated, not only within the same system but across systems.

CHAIRMAN BONACA: Let me ask you this now. If I look at the ECCS accumulators, where will I find them? I mean I understand there will be a table that says ECCS accumulators, whatever you call them. Will it be in a grouping of reactor coolant system components?

MR. BURTON: Yes. You guys are way ahead of me. I was going to explain all of that. Let me go to the next --

CHAIRMAN BONACA: Okay.

MR. BURTON: I think the next slide will actually explain it.

CHAIRMAN BONACA: All right.

MR. BURTON: Section 3 -- that's all I wanted to say about Section 2 because that's really the only change. Section 3, all of the individual systems have been rolled up into six broad what we call system structural groups: 3.1, reactor systems, 3.2, ESF. So to answer your question, any of the ESF systems -- HPSI, RCIC, containment spray -- would be in 3.2. Three point three is auxiliary systems, and as you all know, the auxiliary systems are just all kinds of things: water, raw water, component cooling water, ventilation --

CHAIRMAN BONACA: Instrument air, right?

MR. BURTON: Instrument air.

CHAIRMAN BONACA: That's what I thought.

MR. BURTON: All of it gets caught in the auxiliary system.

VICE CHAIRMAN WALLIS: Seems to me in reviewing this thing I might not need Section 2 at all.

MR. BURTON: Whoa, okay. I want you to hold that question, because towards the end there is the question of how we do a comparison between the plant's program versus GALL. But comparing the plant's program --

VICE CHAIRMAN WALLIS: Is GALL organized

in the same way?

MR. BURTON: Well, yes. The GALL tables look like Section 3 when I show you the example.

VICE CHAIRMAN WALLIS: So you tried to make Section 3 more compatible with GALL, is that what's happened here?

MR. BURTON: Yes. That's exactly what's happened. But the comparison between the plants' programs versus GALL that in and of itself is not what the rule requires. What the rule requires is a demonstration that those individual plant-specific components will be adequately managed. So there is an additional step beyond just saying that, "Yes, your programs are consistent with GALL." Okay.

Each of those six system and structural groups that I had on the previous slide, under each one of those you can have up to three different tables, all right? The first table, 3.X -- the X tells you which of those six groups you're in. Three point 1 dash 1 would be reactor systems, 3.2-1 would be ESF systems. That's what the X means here. But 3.X-1, those tables represent structures and components that were evaluated in GALL, okay? Three point X dash 2 Table represents components that were not evaluated in GALL. And 3.X-3 Table represents

structures and components that were not evaluated in GALL, but the applicant has made a determination that the GALL AMR results are applicable to that component.

This dash 3 table, this is only for Fort Calhoun. Robinson, Ginna, Summer, Bay, they haven't taken that approach. They've actually incorporated this class of components into one of the other two tables, all right? But, in general, you're gong to see at least two tables, and in the case of Fort Calhoun, three. And that's what each of them represent. Okay? As soon as I show you an example, it will --

MEMBER SIEBER: It will just come together.

MR. BURTON: -- clear as mud, right? All right. Let me talk about the 3.X-1 Table. These are the ones that have components that were evaluated in GALL. In the table, these are the different table headings and then there's a -- in the discussion column, at least with Fort Column, it will discuss what material, what environment the component is made of, and we'll identify any aging management programs that they're crediting for managing that. And I'm going to show an example right now.

This is a page out of Table 3.1-1, 3.1

meaning that it has to do -- it's a reactor systems table, and here you can see exactly what makes up reactor systems -- the vessel, internals and the RCS. Those three together are rolled up into this reactor systems table. Here's the link. The link that we saw in Section 2 here's where it gets picked up in Section 3.

These four columns come directly out of GALL. These four columns are both in GALL as well as the SRP, our review guidance.

VICE CHAIRMAN WALLIS: So they have the same row number?

MR. BURTON: Now, again, when you go to GALL in the SRP this link is not there, okay? We had to sort of superimpose these numbers when we were actually trying to do the review. These were not -- again, the linkage was not --

VICE CHAIRMAN WALLIS: There's no cross-link to GALL here? How can I find this in GALL if I want to --

MR. BURTON: Okay. What the 01 means -- the way you would do it is 01 means it's the first item in the table, whether it's the table out of GALL, in Volume 1 of GALL, or whether it's in the SRP. The first row in that table is this one. Okay? So that's

how you go from one to the other.

Here are the columns, component type, aging effect and mechanism. This aging management program, this is the program that is recommended by GALL. This is not the program that the applicant may be crediting, this is what GALL says ought to be done, okay? And in this case, it's actually a TLAA. If GALL recommends further evaluation, it will say so right here.

CHAIRMAN BONACA: So that row number tells me that this is covered by GALL, it is a reactor system component, and it is the first line in the GALL.

MR. BURTON: Exactly. That's exactly right. Three point one means it's a reactor system, dash one means that it's in this table, meaning it's a table of components that was evaluated in GALL, and it's the first item in the GALL table. Okay?

Last column is the discussion column. You can see there's a lot more verbiage here, and it needs to be read, okay, because in here is where you find -- for instance, this happens to be a TLAA, tells you where you can find the TLAA evaluation. They do make definite statements consistent with NUREG-1801, that's GALL. Gives you the material, the environment that

it's exposed to, in this case, again, TLAA, cumulative fatigue damage. They'll give some discussions there. If they are taking exceptions, they mention that there. This is an important column for the reviewer. Okay?

VICE CHAIRMAN WALLIS: How do I know they've done it right? What do I have to do to check out that they've done something right? I have to go to Section 4.3?

MR. BURTON: Okay. Again, I'm going to give an example of that, but -- I'm going to talk about what the reviewer has to do in each of these circumstances. If you can give me just a few more minutes, I'm planning on going through that.

PARTICIPANT: Butch, if they were just totally subscribing to GALL, what would be some words in that discussion column?

MR. BURTON: They would say --

PARTICIPANT: They would say, "fully accept" or "consistent with 1801," period?

MR. BURTON: They would say, "consistent with 1801," and give some of the material environment information. Again, what you're used to seeing in these Section 3 tables is the first column is a component, the same component that you saw in Section

2, along with its material, environment, aging effect and aging management program. Because GALL is sort of a pre-approval of how to manage certain components, they don't provide -- the don't normally provide the material and environment as a matter of course in the table. Now, we can get it over here, but, presumably, if this is a GALL item, if you really wanted to confirm what that material and environment was, you'd go to GALL and confirm that.

VICE CHAIRMAN WALLIS: Now, if all they need here is a copy and paste which says, "FCS aging management reviews are consistent with those reviewed and approved in NUREG-1801," they can simply put it in every blank space.

MR. BURTON: If it applies.

VICE CHAIRMAN WALLIS: How do we know that they've done it.

MR. BURTON: Ah. Again, that --

VICE CHAIRMAN WALLIS: How do you know? I'm not going to check they've done it.

MR. BURTON: Yes. Right. I'm just explaining exactly what they are providing to us. Obviously, there is some confirmation that we have to do, but the confirmation is actually different than what we've done in the past for GALL items, and I'll

talk about that in just a few minutes.

Okay. The other two tables, 3.X-2, these are tables that are not evaluated in GALL. When you look at that table, it looks just like what you're used to seeing. It's got the material, the environment, the aging effect, the aging management program, just like you're used to seeing. And for a component that was not evaluated in GALL, the reviewer is going to have to do the traditional kind of review that he or she has always done.

Three point X dash three tables, these are components that were not evaluated in GALL but they could have been, okay? In this case, we get the traditional six columns -- material, environment, aging effect and so on -- plus, at least in Fort Calhoun's case, there are two additional columns where they make the argument why this component, even though it was not evaluated in GALL, why they should be able to take credit for a GALL AMR result. They make the case in those last few columns, and, again, I'll show you some examples of how that works.

This is an example of a dash-2 table. This should look very familiar. This is what you all always look at with the exception of the link, okay? Component type, material, environment, aging effect

and the program, okay? A dash-3 table looks just like the dash-2 table with those additional last two columns. Applicable GALL AMR result number, they're linking you back to the dash-1 table AMR result that they think applies to this component or group of components. And here's the justification. And what the justification usually is is they say, "Same material, same environment, subject to the same aging effects. We should be able to take credit for the same GALL AMR result." That's what you will usually see there. And then they'll actually link it to where you can find that in GALL.

Okay. That was the Section 3 tables. Now I'm going to talk about the aging management programs. That's the other area that has changed significantly. Okay. When you look at the aging management programs, they fall into three categories. They are either consistent with GALL, 100 percent no change, no difference or they are generally consistent with GALL but they take some sort of deviation from GALL or they're not consistent. And in the next few slides, I'm going to talk about what the reviewer has to do in each of these circumstances.

Some of the AMPs are common, like water chemistry is the perfect example. You credit water

chemistry in the reactor systems group, in the ESF group, in the auxiliary system group, it cuts across system groups, so that we call that common. There are other AMPs that are system group-specific, like one of the programs they have is the Reactor Vessel Integrity Program. That only applies in 3.1, the reactor systems, so it's system group-specific.

Okay. Now I'm going to start talking about what we do when we review this stuff. Okay. There is a new review approach. No change in review approach in Sections 2 and 4. In Section 2, we still have the same goal, which is to make sure that they have identified all the structure systems and components that are within the scope of the rule, that they haven't left anything out, number one; number two, for those systems that are within the scope of the rule, that they have not left out or omitted any structures or components that should be subject to an AMR. That is our goal in Section 2; that has not changed.

Similarly, in Section 4 where we do the TLAAs, we don't do anything any different, we're still going -- making sure that any analyses or calculations that are time-dependent, dependent on 40 years, that they do one of three things. Either the evaluation,

as it currently stands, is good for the entire 60 years; they have expanded the evaluation to include 60 years or they have chosen to actually manage the component. Those are the three options under Section 4, okay, and that hasn't changed.

Significant change in Section 3 and Appendix B, which is the aging management programs. Now, in our documentation, in our SER, the programs are actually in Appendix B of the application, but in the SER they are in Section 3, okay? So there is -- and I think at least the last few have done that. I think you've seen that before.

Okay. Staff performs its review in three parts. Part one is to review the aging management programs. That's kind of the heart of everything. Part two is a review of the aging management review results in the Section 3 tables. And then, finally, there is a review of the adequacy of aging management. This is what the rule requires, okay? And I'll talk about that when we get there, because we had some discussions about exactly what that entails.

Okay. Let me talk about the first part, the review of the AMPs. There are three types of AMPs, I told you. They are either completely consistent with GALL, consistent with GALL with

deviations or not consistent. This first one, these are the ones that are completely consistent with GALL. If that's the case, what does the reviewer do?

VICE CHAIRMAN WALLIS: Nothing.

MR. BURTON: Right. First thing is if they say that they are consistent, the reviewers here in headquarters don't do anything, at least that was the original direction that we got. In the last few days, we've been going back and looking at that again to see whether or not we're really comfortable with that. But the idea is that GALL is considered a topical report, and with topical reports, generally, when they invoke the topical report, there's not a whole lot of background review that we do. We sort of accept that that's the case. Now, with GALL, that's where we hope to get further down the line, but right now it's new, it's just now being tested.

Right now the staff is doing more than that. We're not just taking a hands-off approach. In fact, what we do the claim of consistency, when they say that they are consistent, even though the reviewers here in headquarters don't put any further effort into it, we do check that claim during the AMR inspection, and I just went through that with Fort Calhoun. So we have expanded the scope of the AMR

inspection somewhat. And, again, in the last few days we've had some discussions about whether this is really the best way to go. But right now this is how we check that claim of consistency.

MEMBER FORD: Now, in situations -- GALL was produced a couple of years ago, and some of these things change your time, for instance, the HP degradation issues. So how does the staff take into account it's a moving target and GALL will be changed, but it may not be changed in time for this particular review?

MR. BURTON: Okay. Well, let me talk specifically about vessel head penetrations and Davis-Besse and how we capture that, because, actually, the approach that we use to capture that sort of operating experience that's coming along -- it's really independent of GALL, okay? When we know that there is Davis-Besse, head degradation, obviously a problem, that is a right now problem as opposed to a license renewal problem. The concept is that that issue is going to be resolved in Part 50 space, right now, and those resolutions are going to become part of plants', individual plants' CLB. And with license renewal, whatever the CLB is going into the period of extended operation, that is what is going to be maintained.

And I will just tell you, though, specifically for vessel head penetrations and Davis-Besse, we in fact do have -- have issued either RAIs or open items to the applicants because it hasn't been resolved yet, what we've asked for is a commitment to implement whatever comes out the final resolution of the issue. So we don't ignore it, we don't ignore it. In fact, we pay quite a bit of attention to it. Did I answer --

MEMBER FORD: Yes. Yes.

MR. BURTON: Okay. So staff here in headquarters doesn't do the review. The claim of consistency is actually done during the inspection. The reviewer does, though, look at the FSAR supplement, which is the summary description of the programs and activities. The reviewer still does have to do that, has to do that regardless.

MS. FRANOVICH: Hey, Butch? Do you mind if I add something here?

MR. BURTON: No.

MS. FRANOVICH: This is Rani Franovich of the License Renewal staff. The claim of consistency being confirmed by the AMR inspection is currently under review. The inspection teams have found that some of their reviews of the aging management programs

against the GALL report involve judgment calls: How consistent are the applicants with the GALL report that are better left to the staff to decide the adequacy of?

So it may be that we change our process yet again to involve a table top audit or something of that nature here in headquarters where the reviewers can actually review the aging management programs at the plants against the GALL criteria to see if they are sufficiently consistent to say that, yes, indeed, they are consistent with the GALL report. That's all I wanted to add, Butch.

MR. BURTON: Okay. No, that's good. That's what we are talking about now. This is an example of a GALL program that the claim is that they are completely consistent. As you can see, half a page as opposed to what you're used to seeing with the ten program elements that go on for two or three pages. Very short and sweet. The only thing they need to address is their own plant-specific operating experience, and that's all that the reviewers here in headquarters make a determination about. So this is what you see when they claim to be 100 percent consistent. Okay?

CHAIRMAN BONACA: Okay. No. Actually,

some of the elimination I appreciate because oftentimes it's kind of repetitive. But the operating experience will be every time as planned, right?

MR. BURTON: Say that again, I'm sorry.

CHAIRMAN BONACA: There will be always a paragraph about operating experience.

MR. BURTON: Yes. Yes. Because operating experience is one of the ten program elements.

CHAIRMAN BONACA: I understand that.

MR. BURTON: But because it's plant-specific, you can't incorporate it into --

CHAIRMAN BONACA: That's right. Exactly.

MR. BURTON: -- one of the GALL programs.

VICE CHAIRMAN WALLIS: It's so difficult for me to conclude that because they found nothing, the inspection was effective.

MR. BURTON: Say again, I'm sorry.

VICE CHAIRMAN WALLIS: It's difficult for me to conclude that because they found no deterioration, the inspection was effective. They may just didn't try very hard.

MR. BURTON: You mean the inspectors?

VICE CHAIRMAN WALLIS: I don't know. It's just I don't know how you conclude that the inspection was effective since they found no significant age-

related deterioration. Maybe they didn't try very hard.

MR. BURTON: Okay. Well, I will put out there that I'm sure that that is always a possibility, but I will certainly say that we've gone through this already with Fort Calhoun, and I can assure you, and particularly because it was the first one, we gave Fort Calhoun a very, very thorough scrubbing. And in fact when I come back, I'm actually going to be coming back to talk about this in June, but the lead inspector will also be here and --

VICE CHAIRMAN WALLIS: I guess these are separate statements. You're not concluding that because they didn't find anything, they were effective. There's a completely different measurement of effectiveness somewhere else you guys perform.

MR. BURTON: Of the aging management programs?

VICE CHAIRMAN WALLIS: Right.

MR. BURTON: Yes. After --

VICE CHAIRMAN WALLIS: Well, the In-Service Inspection Program, someone's dug into that and said, "How do they do it, how often do they do it and everything."

MR. BURTON: Right. What I can tell you

-- well, let me just tell you briefly what we did with Fort Calhoun. What Fort Calhoun did, and, again, this is not a Fort Calhoun presentation, but for each of the aging management programs for which they claimed that they were consistent, they actually had a series of binders, engineering analyses, where they broke down the GALL aging management literally line by line. And next to it they said, "Here are the programs that we have on-site that we use to make sure that they are consistent." What the inspectors do is they break out -- like if it's a walk-down or something like that, they actually pull out those procedures and sit with the cognizant engineer and say, "Okay, show me the consistency."

VICE CHAIRMAN WALLIS: Do they look at the record of what they actually did with those procedures?

MR. BURTON: Yes. Yes. And --

VICE CHAIRMAN WALLIS: Look at the log of the walk-downs and everything?

MR. BURTON: Absolutely.

VICE CHAIRMAN WALLIS: Okay. Good.

MR. BURTON: And in fact, one of the things that I asked the reviewers to do for Fort Calhoun back here, back in headquarters -- some of

them feel that their hands are tied somewhat, because they're not supposed to look at anything if it's considered consistent. But I said if there's anything in particular that you really want the inspection team to look at, by all means tell us. And I had a long list. So there was a lot of phone calls back and forth during the two-week AMR inspection actually digging into this, and in some cases we actually brought some of that documentation back for the reviewers to look at. But we'll get into that in a lot more detail when I come and talk about Fort Calhoun.

VICE CHAIRMAN WALLIS: The detail will be before the Subcommittee, though, won't it?

MR. BURTON: Yes. Okay. Second type of AMP that they say they're consistent but they have some type of deviation. What does a reviewer do in that situation? Okay. What the reviewers here do -- the claim of consistency part is still confirmed during the inspection, but here in headquarters we've got to look at that deviation. What is the effect of that deviation from GALL? Is it acceptable? Is it the AMP with that deviation still adequate to manage the aging that's being taken credit for? And, again whether the FSAR supplement is an adequate

description. So when they deviate, we have to follow-up on all deviations. Okay?

In Fort Calhoun's situation, the deviations fell into three general categories. There were clarifications, there were exceptions, and then there were enhancements. And any deviations that they take from GALL have to be investigated and an assessment has to be done.

And in fact, this next example is at Fort Calhoun, their Cooling Water Corrosion Program. And I chose this one for an example because it has all three types of deviations. The first two bullets are clarifications that they're making. In this case, they claimed that they're consistent with GALL AMP 11M-20, which is open-cycle cooling water, and 11M-21, closed-cycle cooling, but they're taking certain deviations. In open-cycle cooling, a program description and program elements 3, 4, 5 and 6, external codings, are addressed not by this because if you go to GALL, the GALL for open-cycle cooling talks about codings but at Fort Calhoun external codings are addressed not here but in another AMP called general corrosion of external surfaces. So they make that clarification.

Similarly, there's -- each of these GALL

AMPs have chemistry-related discussions in them. Fort Calhoun has shifted those not from this particular AMP but in their chemistry AMP, so they make that clarification. Similarly, there are exceptions -- here's an exception. Again, this exception is to GALL 21, the closed cycle. It affects program elements 3, 4 and 5, and this has to do with maintenance of fluid flow and some other stuff. You can read that, but they take an exception, another deviation from GALL.

VICE CHAIRMAN WALLIS: I would think that the corrosion is affected by the fluid flow. You can't say that fluid flow is an active function. It affects static functions.

MR. BURTON: Okay. Well, let me -- okay. I guess I need to explain exactly what the exception is. When you read GALL what we're finding is that there are areas of GALL that need to be changed, and this is one of them. When you read the closed-cycle cooling water system, it gives the impression that this EPRI document, closed-cycle cooling water chemistry guidelines, that it gives some frequencies and in fact it doesn't. Okay? So that's what they're explaining here. Okay? Performance testing and other active system function testing is not performed on an 18-month or five-year frequency in accordance with

EPRI, because this EPRI document does not address this criteria. So they're saying, "We're taking exception to what you're seeing in GALL because GALL really is not right." And, again, we're keeping track of those things too for later.

MEMBER FORD: And so how do your reviewers resolve such a situation?

MR. BURTON: Okay.

MEMBER FORD: Go into the technical literature and do their own analyses or what?

MR. BURTON: Yes. They'll look at EPRI. If the intent of the GALL Program was to do this on a certain frequency and we just got the documentation wrong, the underlying issue, which is how often are you going to do it, still applies. So I would think that what a reviewer would do would look at that aspect, develop an RAI basically saying, "We understand the exception you're making, but you still have to address the underlying issue." So that's how we would -- and then they'd obviously give us a response, and we'll determine whether it's adequate or what. So does that make sense?

MEMBER FORD: Yes. But you're asking the licensee, Fort Calhoun in this case, to go away and look at the corrosion literature to come up with a

rationale why they should be doing this exception to this particular --

MR. BURTON: Yes. Why is this exception okay? And, again, I don't want to talk specifically about this because I don't know, but the exception that they're taking they may say, in fact, that it's not -- we don't do it on a regular frequency, we may do it just based on what we do see and will see the next time, I don't know.

VICE CHAIRMAN WALLIS: I don't understand this at all. I mean it's something about Cooling Water Corrosion Program, right? And it talks about we're only concerned with the pressure boundary, not in the maintenance and fluid flow, which obviously has some effect on water corrosion. We don't do this thing because EPRI doesn't consider it, and then an unobstructed testing and heat transfer performance are performed. Well, heat transfer performance has nothing directly to do with Cooling Water Corrosion Program, so this may just be a whole lot of fuzzy snow that --

MR. BURTON: Okay.

VICE CHAIRMAN WALLIS: How do you make sense of that paragraph?

MR. BURTON: Well --

VICE CHAIRMAN WALLIS: Does the reviewer make any sense of that paragraph?

MR. BURTON: Hopefully, the reviewer does, and unfortunately the reviewer is not here to talk about that, but I know you guys are starting to home in on the words that are here, and I don't want -- that wasn't what I wanted -- I want you to just kind of see how we do things.

VICE CHAIRMAN WALLIS: I guess that's the way I'd review this thing, and the whole thing is an enormous great big monster to review.

MR. BURTON: Yes.

VICE CHAIRMAN WALLIS: I just look at one or two things and say does that make any sense to me? And if doesn't, I'm going to say why should I believe the whole thing? That's the only way I can review this document.

MR. BURTON: Well, okay. Well, let me say this: The reviewers do know the GALL programs, that they do know. And if there are exceptions that are being taken, okay, they have a good understanding of if you take this exception, how is that impacting on what is the intent of the GALL Program? And if the applicant in the LRA doesn't have what the reviewer would consider a reasonable justification for the

exception, they need to ask an RAI and dig into it. And at this point, that's all I can tell you.

VICE CHAIRMAN WALLIS: I just wonder, how do we have any assurance that these reviewers understand their job, that they know how to do it and that they do it properly when they're confronted with this snow of information like this?

MR. BURTON: Well, the one thing I can tell you is that actually what I'm presenting to you now is a watered down version of about a three- or four-hour training session that we gave to the entire technical staff --

MS. FRANOVICH: November or --

MR. BURTON: -- November maybe.

MS. FRANOVICH: -- October.

MR. BURTON: We've done training sessions --

VICE CHAIRMAN WALLIS: I'm not sure that training is going to be helpful if they don't understand how heat transfer and water flow will affect corrosion.

MS. FRANOVICH: Can I ask a question that may clear this up, Butch? Could it be that the exceptions have to do with the loss of material, aging effect, and that the program criteria that address

falling, loss of heat transfer, that kind of thing is consistent with the GALL report? I haven't done a GALL report review so I don't know if that's the case, but could that be an explanation, Butch, of why those things are not addressed in the exceptions?

MR. BURTON: That could be, that very well could be. But I guess I want -- I don't want you to go away feeling that the staff, number one, doesn't understand how to deal with these issues, because --

VICE CHAIRMAN WALLIS: They must be pretty smart people, it seems to me.

MR. BURTON: Well, yes. Well, actually they are, they are very smart people. And then even though we are capturing this in GALL, these are not new issues. These are issues that have come up since the beginning of license renewal, and we've got reviewers who have been there since the beginning. They understand the technical issues, and they understand the implications of taking an exception to GALL and how they need to follow up on that.

MR. KUO: If I may interject, I'm sorry. This is PT Kuo, License Renewal. The reviewer who is going to do the review on this application are the same reviewers that have been doing the license renewal. So the difference here is only the format

difference here we are talking about.

VICE CHAIRMAN WALLIS: So we have a mechanism for common cause failure here. It seems to me the only way any error is revealed here is if there's some sort of an accident at Fort Calhoun that turns out to be because something corroded because it wasn't properly monitored or managed or something. And then we find out, gee whiz, why did that happen? And it turns that when you investigate, it was the staff allowed them to do something because they didn't understand what they were doing. That's the only way that these things would ever emerge if there were. I'm not saying there are going to be any errors in reviewing but if there were, I don't quite know how they're detected.

MR. BURTON: Well, you know, I think as a practical matter you're right, you're right. All a reviewer can do is go on their knowledge, and it's not just their knowledge, they have access to the entire knowledge of the Agency, okay, to say whether or not this deviation that they're taking is okay.

VICE CHAIRMAN WALLIS: But can the reviewer say, "I don't understand it; therefore, I can't make a decision"?

MR. BURTON: Oh, absolutely. That's where

the RAIs come from.

VICE CHAIRMAN WALLIS: Do they often say that many times?

PARTICIPANT: Many times.

VICE CHAIRMAN WALLIS: Many times. Okay. Thank you.

MR. BURTON: Not every time, but, you know --

MEMBER FORD: I've got a process question.

MR. BURTON: Okay.

MEMBER FORD: This last one you've just been talking about points up a situation where you're saying that the GALL report, or specifically this EPRI document, is merely incomplete in certain ways. And if it's incomplete for Fort Calhoun, it's incomplete for everybody who's going to use that particular GALL instruction. Therefore, is there a feedback circuit to going back and restructuring the GALL to take into account that academic or that factual --

MR. BURTON: I understand exactly what you're saying.

MEMBER FORD: Is there a process by which GALL gets rapidly changed, so we don't have to keep going through this --

MR. BURTON: Well, I won't -- I guess it

depends on your definition of "rapidly." First of all, Fort Calhoun is the first one to go through this --

MEMBER FORD: Yes, I understand that.

MR. BURTON: -- so we are just now finding all these little things.

MEMBER FORD: Sure.

MR. BURTON: What I do is I keep a running tally, okay? The technical reviewers -- very often the same person who is reviewing Fort Calhoun is probably reviewing two or three others, okay? So, certainly, we get that. There's a lot -- in order for this process to work, it requires a lot of crosstalk between reviewers, not only between reviewers who may be reviewing the same AMP but between the AMP reviewers and the reviewers who are looking at the Section 3 tables, because they're not always the same person. So there's a lot of crosstalk that goes on, and we as project managers try to encourage that. And there's a lot of information exchange on just those kinds of things.

MR. KUO: Butch, if I can address Dr. Ford's question. I think you are looking for a feedback mechanism. With the lessons learned from this review, yes, we do. We have kept a running log

of what we have found, that GALL may need to be improved or may need to be changed. We have a running log of that. And we have a plan to revise the GALL SRP guidance document. Actually, right now I'm -- we are shooting for '04, next year, to update the entire set of guidance documents. And we are working with the industry to establish a schedule for doing that. In the meantime, some of the license renewal lessons learned issues we have turned that into what we call the interim staff guidance for the industry to use.

MR. BURTON: This is the second page of that same program. This is the third type of deviation that we have at Fort Calhoun, which is an enhancement to GALL, where, again, for each of the GALL programs that they're saying they're consistent with for these particular program elements, they are making this enhancement.

Usually, enhancements are saying they're going to do more over and above what GALL asked them to do. But, again, each of these deviations the reviewers have to assess the adequacy of the deviation and whether the program with those deviations is still adequate to manage the aging effect for which it's credited. And we made very definite statements in the SER about that.

Programs that are not consistent with GALL. Those that aren't we go back to our traditional review where we evaluate each of the ten program elements. In the SRP, we have a branch technical position on exactly how to do that. So for those that are not consistent, we do it the old way. And, again, look at the summary description of the program to make sure it's adequate.

This is an example -- I'm not going to dwell on this. This is what you normally see. This is a program that's not consistent with GALL, so it's got all ten of the program elements. This first one shows the scope, here are the systems that credit this program in the next couple of pages. It's what you've normally seen with an aging management program with the ten elements. So I'm just going to skip through the next few.

Okay. That was part one of the review, when we look at the aging management programs. Part two is looking at the Section 3 tables. These are the -- there are program reviewers and then there are AMR results reviewers. These are the people who go through those Section 3 tables and check that claim of consistency. For the 3.X-1 Table, again, components that were evaluated in GALL, two types of information.

First type of information are assessments of structures and components that are consistent with GALL and GALL says it doesn't recommend any further evaluation. That's one type.

The other type of information in this are assessments of structures and components that are consistent with GALL, but GALL itself says there are certain aspects that require further evaluation. And if you go into the GALL, it will tell you line by line which are consistent with no further evaluation and which are consistent but require some further evaluation.

What does the staff do for that first type, for structures and components that are consistent but no further evaluation is required? Again, just like with the programs, if they say they're consistent, the reviewers here are done, although, again, like I said, we're discussing that may change. But right now that's kind of where we are.

The consistency is confirmed during the AMR inspection. And if we find any problems there, the inspectors kick that information back here to headquarters for evaluation by the reviewers here. What we're talking about, as Rani said before, is

rather than putting that on the inspection team, what we'll do is we may have the applicant come in and bring several examples of programs that they claim to be consistent, bring some of the background material and actually go over it.

As I mentioned before, reviewers, even though we say that they don't perform the consistency check, if there are particular things that they feel sort of uncomfortable about, they really want to have a little bit more of an in-depth check, they'll call that out and have the inspection team go over that specifically.

Okay. Consistent with GALL but GALL recommends further evaluation. Consistency part, AMR inspection team does that. The reviewer does focus his or her review on that recommended further evaluation. And what is involved with that further evaluation is documented in our SRP. So when GALL says further evaluation, well, like what are they talking about, what do I need to look at? The SRP will give them that guidance.

Okay. Back again, 3.3 auxiliary systems. And auxiliary systems can have 20 or more individual systems in it, but, again, in the Section 3 tables, they're all rolled up into dash-1, dash-2 or dash-3

tables. I just put this up because this is an example where further evaluation recommended, yes; detection of aging effects is to be further evaluated, yes; plant-specific, yes; TLAA. If you see a "no" here, then it's in that first bin, "no further evaluation recommended." If there is, it will give a "yes," and yo go to the SRP to find out exactly what that evaluation would involve.

Three point X dash two tables contain assessments that were not evaluated in GALL. In that case, the reviewer here in headquarters does their traditional pre-GALL review, the way we've always done it.

Just very quickly, here's an example of a, again, 3.3 auxiliary system dash-2 table, components that were not evaluated in GALL. In that case, material, environment, aging effect, aging management program. If there's no aging effect that requires management, stainless steel and ambient air, it will say so. And, again, all these are linked, okay, from Section 2.

Again, dash-3 tables, Fort Calhoun only. The other plants behind Fort Calhoun do not have this dash-3 table. Reviewer determines if GALL can be credited. Because, remember, in this table, they're

making the justification for why the components in this table should be -- the GALL AMR results should be credited for that component. This is where they make the case.

VICE CHAIRMAN WALLIS: Can you give an example of that?

MR. BURTON: I'm sure I can. Let's see, the very next -- again, auxiliary system table, dash-3. There is a link 3.3-3, Item 7 in this table. Here are the components. These components were not -- and what's different is apparently these components made of this material, in this environment was not evaluated in GALL, okay, specifically. Aging effect, here's the program that they credit, but they're saying even though these components were not evaluated in GALL, I'm claiming that they could be evaluated under this GALL AMR result.

Why? The material is subject to the same environment and aging effect and managed by the same management program as evaluated here. The aging effect is independent of component type. Basically, what they're saying is, "These components -- there is a component here made of this material in this environment and, consequently, has these -- credits that AMP, and we want to apply it for these too.

Technically, GALL didn't include these, but we feel that you can do that." And in that case, the reviewer has to make a call to say whether or not that's acceptable.

Okay. This is the part, Part 3. This is the part that is required by the rule. The rule does not say make sure that an applicant's programs are consistent with GALL; that's not what the rule says. What the rule says is that an applicant has to demonstrate adequate aging management for their components.

MEMBER FORD: But the metric of adequacy is GALL. So you are looking to GALL.

MR. BURTON: Yes. You are looking -- GALL is definitely part of that. That's the first part of being able to make this determination, but I'm going to give you an example of why just doing this comparison is not enough. Say you're looking at structures, and there's a certain way that you're going to manage concrete components. GALL says you do it A, B and C, okay? You look at the applicant's programs and they say, "We're going to do it A, B and C." Great, no problem. You look at steel components. GALL says X, Y and Z; program thing says X, Y and Z. Great.

Now, what you do is you -- okay. Now, in all of that you have not looked at individual plant-specific components, you've looked at AMPs. Now you go and start in Section 2 with those links and say you're looking at links associated with a concrete structural component. You follow the links through, you look at the first link, it links you to the right thing in Section 3, to the right aging management program. Great.

You go back, there's a second link for that same component. You follow that, wait a minute. That link is going to a steel aging management program. Something is wrong. So from a reviewer's point of view, just doing that program comparison, that is not enough. You have to actually follow those links through to see where they're going to make sure that they're going to the right place.

MEMBER FORD: So there's no way of -- something came up just recently. You can't look at the performance of rebar in concrete by this process.

MR. BURTON: Say that again.

MEMBER FORD: You can't look at the structure integrity of rebar, reinforced bar, in concrete by this process.

MR. BURTON: Well, I don't want to say

that, and I'm not familiar enough particularly with structural stuff with GALL to say. GALL may address that, I don't know, and you'd have to get one of the structural people here. Let's assume it does, let's assume it does. If it addresses it and what -- GALL is supposed to be the end process of what the staff has approved as credit for existing programs. If an individual applicant is following that, that should be okay.

Now, if it wasn't evaluated in GALL, then we're going to have to get the plant-specific basis for how they're going to do that. We still have to do that. But GALL is supposed to be an effort where you don't have to keep going through that stuff over and over again. We've got established, approved means of managing a particular component. But, again, the specific thing, I can't speak specifically to it.

MR. KUO: Let me just speak to that. Yes, indeed, the GALL evaluated both the concrete itself and the rebar.

PARTICIPANT: Good. That's good.

CHAIRMAN BONACA: We need to move on.

MR. BURTON: Okay. All right. Okay. I talked about the need for a lot of crosstalk. AMR reviewer who's looking at Section 3 must communicate

with the AMP reviewer to ensure that the components are adequately managed. When they're following those links through and they get to the program, that reviewer has not actually reviewed that program. They've got to talk to that program reviewer and say, "Did you find any problems here? They're taking credit for this particular component. Is there any problem with that? What problems have you found?" And there's got to be that feedback.

And, actually, I think I'm going to skip a whole bunch of these, and I am going to get to how we document some of this stuff. Okay. And I'm skipping through a lot, and this is what I wanted to skip through anyway. If you find your Slide Number 23, this is where I'm going to start talking about how we document the results.

Okay. Just like you mentioned, it's a complex review, okay, and it is very easy to start to get yourself turned around with some of this stuff. So what we did was we developed a template for the SER, and we put a number of -- we put in a lot of boilerplate language that was pre-approved by the lawyers. And what it does is it gives -- even someone who is new to license renewal, it gives them guidance on what it is you're trying to do, what is the end

result of your review? And it's documented in that boilerplate, either introductory or summary, language. So we've put together a template.

The template actually includes several columns of that 3.X-1 Table. It actually has, straight out of the SRP, the component type, the aging effect and the aging management program that GALL credits. There are two additional -- I think it's in there.

But next to that is here's what GALL says -- how GALL says it should be managed, here is how the applicant manages it, right next to each other. And then right after that is a summary of the staff's assessment of that. It will either say, "Yes, we agree it's consistent," or, "Yes, we agree it's consistent with further evaluation recommended and here is in the SER where you can go and see our evaluation of that," or, "No, it's not, and you can find our evaluation of that here." But it's all in one place. It gives a road map where you can find the individual results.

This comes out of a template. What I wanted to do is start with Section 3, and the next few pages is where we actually trying to give the reader sort of a summary. Section 3.0.1 talks about the GALL

format, the stuff I just went over with you, okay, to try and help explain what they're looking at there. Section 3.0.2 gives a summary of how the staff went about its review.

So when you get the SER, you know, if you've forgotten all this stuff I've been saying to you, it's all right there. One of the things that we've done -- I think we're already doing this even before Fort Calhoun -- but in Section 3, what I'm going to be providing to you is a table of the common AMPs. And for each of the common AMPs, like, for instance, bolting integrity, here are the two GALL AMPs that they claim to be consistent with, here are the system groups that credit this program, and here is where you can find the staff's evaluation in the SER. So, again, with this table, it will direct you exactly where you need to go to look at what you want to look at.

Right after that table we have the aging management programs that are system-specific; they aren't common. Containment leak rate, here are the GALL AMPs that it claims to be consistent with. You can find it in 3.5 structures, and specifically in this subsection is where you'll find the staff's evaluation of that program. So that's what's going to

be in the SER.

VICE CHAIRMAN WALLIS: Isn't the staff's evaluation going to be a refrain which says that the licensee has met all the requirements of the GALL report; therefore, everything is blessed and they can proceed? And it's going to say the same thing over and over and over and over and over again?

MR. BURTON: Rest assured, because I just got finished my first pass on the Fort Calhoun SER, it will not say that. You will not be bored.

(Laughter.)

MR. BURTON: Very interesting reading. Very interesting reading.

New documentation of staff review results. This isn't set in stone; I'm still looking at this. Because the AMR inspection now has an expanded scope and it's a little more critical to reaching our reasonable assurance finding, I was considering actually including it in the SER. But after the recent discussions that we had, I'm not sure that that's going to happen. But that was a consideration.

Lessons learned. This first thing requires more time than we have, okay? What we found with these first applicants is that when they say they are consistent with GALL, we have different

understandings of what that means, okay? We recognized it right away, staff jumped right on it, and there were a series of meetings with NEI to nail this down.

Just very briefly, what we mean when we see the words, "consistent with GALL," means same program -- I mean same component, same material, same environment, same aging effect, same aging management program. If any of those are different, they're not consistent. What we found is that several of the applicants gave themselves some leniency with what consistent means.

And I think in the worst case, and I can't think of which one it was, when they came in for their overview about a month after they submitted their application, we asked, "When you say consistent what does that mean?" And they said, "We've got the same component." That's it. Could be a different material, different environment, completely different aging effects, different aging management program, but they still say they're consistent. That's a problem.

So the staff has its work cut out for it in terms of getting to the root of all this and making that adequacy call. Fort Calhoun was not one of them, I can tell you that. Okay? So we are hopefully with

the next application, which is Farley in September, that class of '04, I guess it is, hopefully this is settled, we won't have this anymore.

We also talked with NEI at the same time about some formatting changes that would improve things. And then, finally, I've been getting feedback from the reviewers about the template and how we can maybe do some things. When they are consistent, we should have less verbiage on what they're consistent with and more verbiage on what they're not consistent. That's basically what the comments are that are coming back. So we're looking at alternative ways for the template. Okay?

And then, finally, Fort Calhoun is the first application to fully utilize the new GALL process. I will be prepared to talk to you about in-depth in June. We have six plants in-house right now. We've developed a review and documentation process to help with the review.

And, finally, when all this is over, as PT mentioned, we've been keeping a running tab of things that need to be looked at afterwards, and I'll be doing a full debrief with all of the reviewers as well as the applicant when all of this is over to see what lessons learned we have, and we'll be incorporating

them into our license renewal documents in the future, in '04, as PT mentioned.

MEMBER FORD: Is there anything in your lessons learned so far to show that we have missed things in advance that we have approved licenses for, license renewals for?

MR. BURTON: The answer to that, I guess I would have to say, yes, but it's not GALL-specific. There are technical issues that come up all the time, and one of the things that we're struggling with is -- okay, let me give you a for instance. Ten CFR 54.4(a)(2), that's a scoping criteria, non-safety-related SSCs whose failure could adversely impact on an intended function. In the rule, we have developed an interim staff guidance on how an applicant should approach that and capture that population of SSCs. With any ISG that comes up, one of the things we have to do is we've got to say, well, how does this impact on those who already got their license, okay?

So there are technical issues that come up. That's one of them. We have one about fuse holders, there's a whole series of them. But one of the things that we're struggling with is even when we come up with a resolution to this issue, what about those people who have gotten their license? What

should be the appropriate mechanism to bring them on board to deal with that? And, you know, we're looking at the whole 50-109 backfit thing. We don't have a clear answer, consistent answer with that yet, but we are aware of it and, believe me, it's the subject of a lot of discussion.

MR. KUO: And, Dr. Ford, I think, just like Butch mentioned, this concern that you have is really not GALL plant-specific. It happens all the time. That's the most troubling aspect of this review is that we always have the late-coming RAIs. The staff's initial evaluation missed something, and then we are at the time writing SER. All of a sudden this is a new question, but we have to go out to the applicant and ask them to address it.

Yesterday, we briefed the Committee on Peach Bottom, for instance, the top guy issue. That was the last minute issue that we asked the applicant to address. So, yes, for our practical purposes, that is a matter a lot. We do find that the staff sometimes miss some issues, but hopefully we will catch it all the time.

MR. BURTON: And the last thing I want to say is, you know, the handouts that I gave you have three-hold punch in them. Put them in a binder

because this is going to come up again, not just from me in June but --

CHAIRMAN BONACA: Okay. All right. Any questions?

MR. KUO: If I may say something again, I just wanted to emphasize that this is a new review approach. The staff has struggled with it for a long time, and I'm sure -- I won't be surprised at all that the members of this committee will find difficulty in navigating the application or even having problems with how the staff reached its conclusion. So I would like to make an offer. Before June when Butch has to come before the Committee to make the Fort Calhoun meeting, at any time that the members of this Committee have any questions and doubts or clarifications, let us know, we will be there to provide information or even to give any informal briefing.

CHAIRMAN BONACA: Okay. Thank you.

MEMBER POWERS: You're welcome.

MR. BURTON: Thank you.

CHAIRMAN BONACA: Thank you for the informative presentation, and I think we will now go through experience with this review, I guess, for when Fort Calhoun comes up.

PARTICIPANT: Just when we thought we knew what we were doing.

(Laughter.)

CHAIRMAN BONACA: Okay. We won't be very shy about giving you our comments, we are sure about that. Okay. With that, we can now stop the recording of the meeting.

(Whereupon, at 12:03 p.m., the ACRS meeting was concluded.)

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 500th 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.

Eric Hendrixson

Eric Hendrixson
Official Reporter
Neal R. Gross & Co., Inc.

Presentation to the Advisory Committee on Reactor Safeguards

EARLY SITE PERMIT (ESP) AND ESP REVIEW STANDARD

Presented By
Ronaldo Jenkins
Michael Scott
Early Site Permit Project Managers
New Reactor Licensing Project Office

March 7, 2003

Purpose

- Brief the Committee on status of activities leading up to receipt of first three ESP applications
- Brief the Committee on the contents of the draft ESP Review Standard (RS), in conjunction with Committee review of draft document and potential letter to the Commission
- Discuss future milestones for ESP RS document development and use
- Address Committee questions or comments on ESP process or ESP RS

Agenda

- ESP issues and planned activities 30 min
- ESP RS document development approach 10 min
- ESP RS document content 30 min
- Plans for further development and use of ESP RS 10 min

ESP Issues

- NRC staff has met several times with the Nuclear Energy Institute (NEI) and potential applicants to facilitate resolution of ESP issues prior to submittal of applications
- Staff has sent letters to NEI to document staff positions
- Staff is also developing a SECY paper to communicate positions on ESP issues to the Commission
- No additional ESP-related meetings are planned with NEI before applications are submitted
- Emergent issues raised by applicants will be resolved on a case-by-case basis

Staff Positions on ESP Issues

- The staff expects ESP applicants to use applicable QA controls equivalent to those in Part 50 Appendix B for ESP activities that would affect the design of future safety-related systems, structures, and components
- Applicants may use a plant parameter envelope (PPE) to provide the design information required by regulations in lieu of providing a specific plant design
- NRC will evaluate the ESP applications to ensure that the requested duration is supported by the applicable data and analyses

Staff Positions on ESP Issues (Continued)

- ESP applicants must provide radiological dose consequence evaluations; they may use the PPE approach
- ESP applicants are expected to evaluate severe accident impacts but may defer severe accident mitigation alternatives to the combined license (COL) stage if information is not available at the ESP stage
- A position on evaluation of alternative sites is currently in staff review

Other Activities

- Conduct local public meetings
  - Grand Gulf: Nov. 14, 2002
  - Clinton: Mar. 20, 2003
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- Plan additional public meeting in Rockville on May 14, 2003 to inform and receive feedback from public on ESP review process and ESP Review Standard
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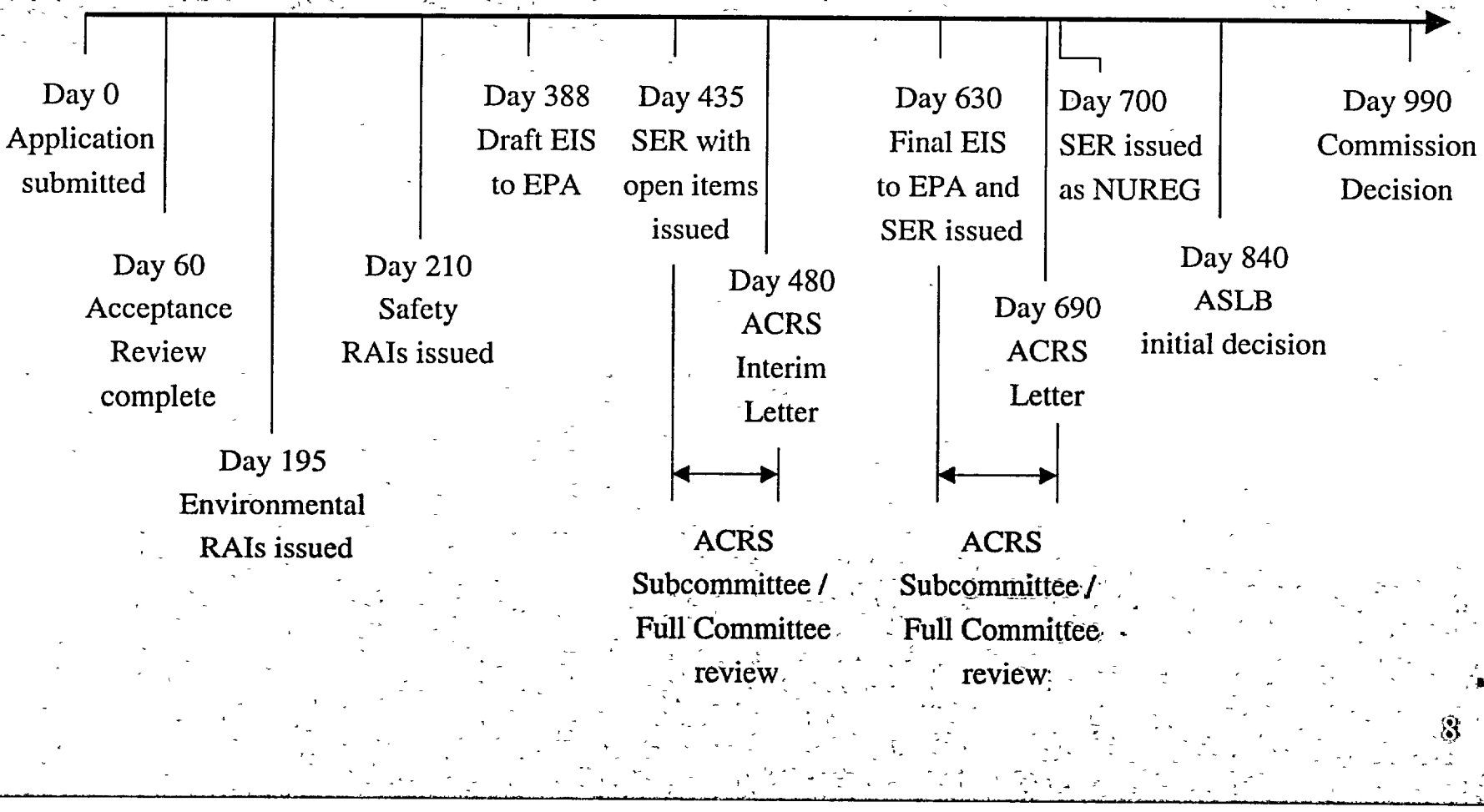
Nominal ESP Timeline

33 months receipt to Commission decision



ESP Review Standard (RS)

- Purpose of ESP RS is to provide guidance to staff and information to stakeholders on review of an ESP application
- Use of existing guidance to the extent feasible was the basic premise in the development of the ESP RS
- While staff sought consistency with draft power uprate RS and license renewal guidance, draft ESP RS and power uprate RS emerged quite different in format and content (different scopes, situations, and availabilities of precedent)

Document Development Status

- Draft ESP RS released for interim use and public comment in December 2002; comment period ends March 31, 2003
- Provided copies of document to Committee in January 2003 for review
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  - Regulatory Guides
  - Information Notices
  - Generic Letters
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Standard Review Plan Markups

- Primary review branch asked to mark up assigned sections of NUREG-0800 and NUREG-1555 to achieve two results:
  - Strike out text not applicable to ESP to clearly show what is needed and what is not at ESP stage
  - Revise (using highlight and strikeout) existing guidance to bring portions of sections applicable to ESP up to date

Results of Staff Markups

- Most applicable sections of NUREG-0800 are in Chapter 2 (Site Characteristics)
- Certain sections (e.g., 2.4.8 and 2.4.10) were found to not be needed for ESP review, since applicable parts of those sections were adequately addressed in other sections
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  - QA (new guidance being developed)
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- "Snapshot in time" nature of environmental impact statement reduces need and feasibility of attempting to specify what is needed at each licensing stage

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  - Applicant and licensee different: Licensee ensures compliance with 10 CFR 20; applicant discusses impacts on construction workers in environmental report

Issues Addressed During Document Development (Continued)

- Adequacy of coverage for subsurface investigations
  - Reasonable assurance that actual site conditions revealed during excavation will be consistent with model developed for ESP
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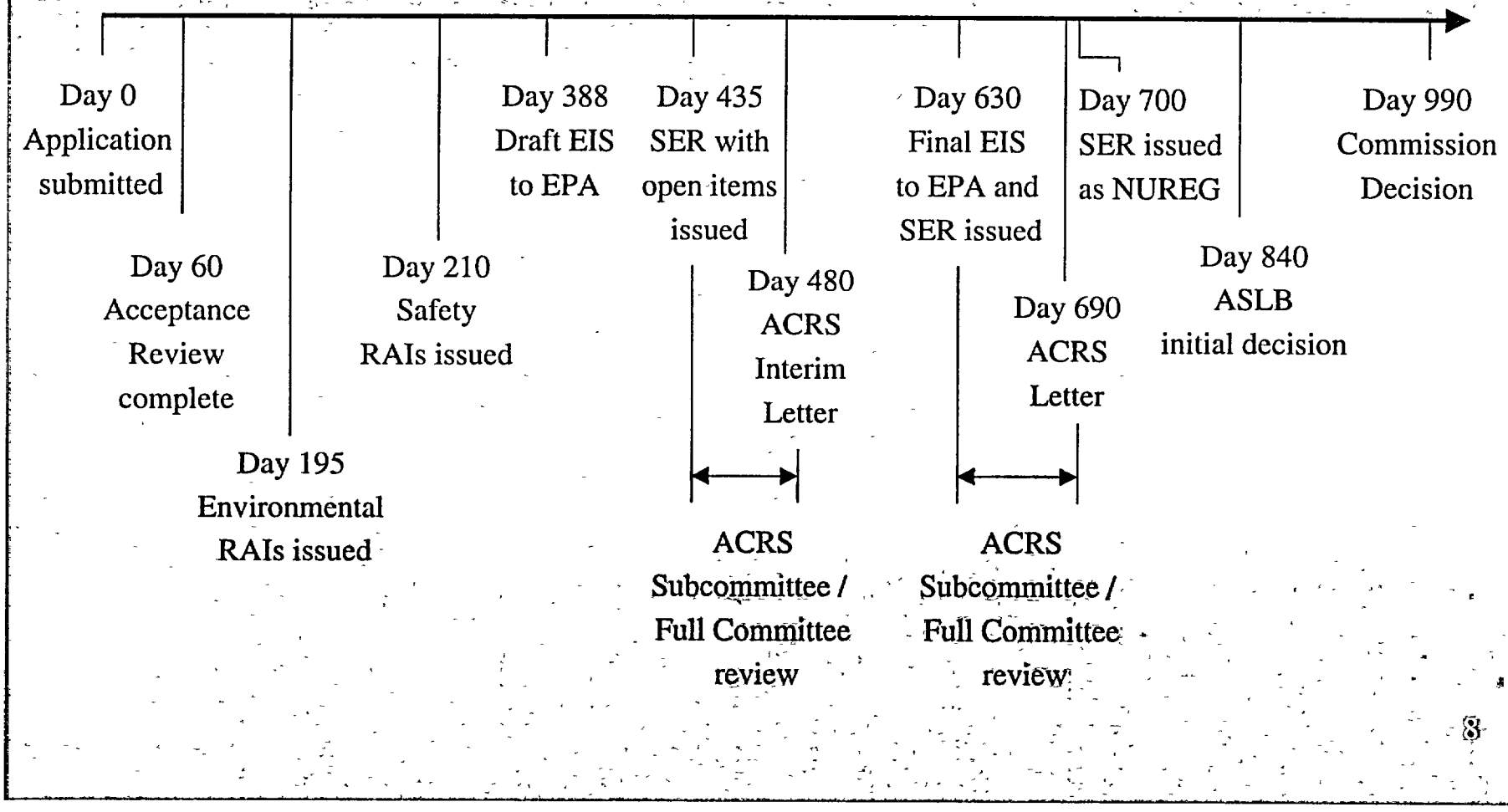

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ACRS BRIEFING

LICENSE RENEWAL UNDER THE NEW GALL REGIME

MARCH 7, 2003

WILLIAM "BUTCH" BURTON
NRR

BRIEFING AGENDA

CURRENT STATUS OF GALL PLANTS

NEW LRA FORMAT

NEW REVIEW APPROACH

NEW DOCUMENTATION OF STAFF REVIEW RESULTS

CURRENT STATUS OF GALL PLANTS

St. Lucie is the last pre-GALL plant (although aspects of GALL were incorporated into the St. Lucie LRA)

Starting with Ft. Calhoun, all plants applying for a renewed license will follow the GALL process

Six GALL plants are currently under staff review:

- **Ft. Calhoun**
- **Robinson**
- **Ginna**
- **Summer**
- **Dresden/Quad Cities**

NEW LRA FORMAT

SECTION 2: SCOPING AND SCREENING METHODOLOGY AND RESULTS

Section 2 tables contain links to Section 3 tables

SECTION 3: AGING MANAGMENT REVIEW RESULTS

Section 3 format has changed significantly!

SECTION 4: TIME-LIMITED AGING ANALYSES

Section 4 format has not changed

APPENDIX B: AGING MANAGEMENT PROGRAMS

App. B format has also changed significantly!

TABLE 2.3.3.8-1
INSTRUMENT AIR
Component Types Subject to Aging Management Review and Intended Functions

Component Type	Intended Functions	Aging Management Review Results
Accumulators	Pressure Boundary	3.3.1.07 3.3.1.13 3.3.2.23 3.3.2.25
Bolting	Pressure Boundary	3.3.1.05 3.3.1.13
Filter Housing	Pressure Boundary	3.3.2.01 3.3.2.04
Pipes & Fittings	Pressure Boundary	3.3.2.71 3.3.2.75
Tubing	Pressure Boundary	3.3.2.37 3.3.2.40 3.3.2.71 3.3.2.72 3.3.2.71
Valve Body	Pressure Boundary	3.3.2.01 3.3.2.04 3.3.2.05 3.3.2.10 3.3.2.13 3.3.2.14 3.3.2.71 3.3.2.72 3.3.2.71
Valve Operator Bodies	Pressure Boundary	3.3.2.01 3.3.2.04 3.3.1.05 3.3.1.13 3.3.2.23

NEW LRA FORMAT

SECTION 3

INDIVIDUAL SYSTEMS HAVE BEEN ROLLED UP INTO 6 BROAD SYSTEM/STRUCTURAL GROUPS:

3.1 - Reactor Systems
3.2 - ESF Systems
3.3 - Auxiliary Systems
3.4 - Steam and Power Conversion Systems
3.5 - Structures
3.6 - Electrical and I&C

As a result of the system roll-up, individual systems are lost in Section 3

NEW LRA FORMAT

SECTION 3

EACH SYSTEM/STRUCTURAL GROUP CONSISTS OF 3 TABLES:

3.X-1 Structures and components (SCs) evaluated in GALL

3.X-2 SCs not evaluated in GALL

3.X-3 SCs not evaluated in GALL, but GALL could be credited with managing component aging

Note: Robinson, Ginna, and Summer do not have 3.x-3 tables

Section 3 tables include links from Section 2 tables

NEW LRA FORMAT

SECTION 3

3.X-1 TABLES LIST SCs EVALUATED IN GALL

- Component group
- Aging effect/mechanism
- GALL AMPs
- Whether GALL recommends further evaluation
- Discussion

Discussion column identifies component materials and environments, gives information on GALL, and identifies AMPs that are credited for managing component aging

TABLE 3.1-1
SUMMARY OF AGING MANAGEMENT PROGRAMS FOR REACTOR VESSEL, INTERNALS, AND REACTOR COOLANT SYSTEM EVALUATED IN NUREG-1801 THAT ARE RELIED ON FOR FCS LICENSE RENEWAL

Row Number	Component	Aging Effect/ Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.1.1.01	Reactor coolant pressure boundary components	Cumulative fatigue damage	TLAA, evaluated in accordance with 10 CFR 54.21(c)	Yes, TLAA	1. The FCS aging management review results are consistent with those reviewed and approved in NUREG-1801 except as noted in item 4 below. 2. The metal fatigue time limited aging analyses are discussed in Section 4.3. 3. Consistent with NUREG-1801, this group includes the low alloy steel and carbon steel with stainless steel cladding, stainless steel, CASS, and nickel alloy in borated treated water; and low alloy steel in deoxygenated water and steam at FCS. 4. Cumulative fatigue damage is not an aging effect requiring management for control element assembly shroud bolts and core support barrel snubber assembly socket head cap screws. These components are preloaded to prevent fatigue cycles.

NEW LRA FORMAT

SECTION 3

3.X-2 TABLES LIST SCs THAT WERE NOT EVALUATED IN GALL

Table format is similar to the traditional 6-column tables in pre-GALL applications

3.X-3 TABLES LIST SCs NOT EVALUATED IN GALL, BUT GALL CAN BE CREDITED FOR MANAGING COMPONENT AGING

Traditional 6 columns, plus 2 additional columns that provide justification for crediting GALL for aging management

Note: Only Ft. Calhoun has 3.X-3 tables

TABLE 3.1-2
FCS REACTOR VESSEL, INTERNALS, AND REACTOR COOLANT SYSTEM COMPONENT TYPES SUBJECT TO AGING MANAGEMENT NOT EVALUATED IN NUREG-1801

Row Number	Component Types	Material	Environment	AERMs	Program/Activity
3.1.2.01	External surfaces of stainless steel components in reactor coolant system pressure boundary	Stainless Steel	Ambient Air	None	Not Applicable
3.1.2.02	Pressurizer heater sleeves, steam generator - tubes, ICI nozzles, nozzle safe ends, CEDM and incore instrument housings, reactor head vent pipe, pressurizer bottom head plate cladding, steam generator primary head cladding and shock suppressors & supports, nozzle welds, thermal sleeves	Nickel Based Alloy including Alloy 600	Borated Treated Water	Loss of Material Crevice corrosion in the presence of sufficient levels of oxygen, halogens, sulfates, or copper	Chemistry Program (B.1.2)
3.1.2.03	External surfaces of nickel based alloy components in reactor coolant system pressure boundary	Nickel Based Alloy including Alloy 600	Ambient Air	None	Not Applicable
3.1.2.04	Steam generator lower head and manway cladding and primary side tube sheet	Nickel Based Alloy	Borated Treated Water	Cracking	Chemistry Program (B.1.2)

TABLE 3.3-3 (CONTINUED)
COMPONENTS IN AUXILIARY SYSTEMS NOT EVALUATED IN NUREG-1801 THAT RELY ON AGING MANAGEMENT PROGRAMS IN NUREG-1801 FOR FCS LICENSE RENEWAL

Row Number	FCS Components	FCS Material	FCS Environment	FCS AERMs	FCS Program Activity	Applicable NUREG-1801 Aging Management Review Results Row Number	Justification for applying NUREG-1801 Aging Management Review Results
3.3.3.09	Valve bodies, piping & fittings, duct, damper, bolts, heat exchangers	Cast iron, cadmium plated steel, galvanized steel, copper alloy	Ambient Air	Loss of Material	Boric Acid Corrosion (BAC) Prevention Program (B.2.1)	3.3.1.13	The material is subject to the same environment and aging effect, and managed by the same aging management program as evaluated in Table 3.3-1, Item 3.3.1.13. The aging effect is independent of component type.
3.3.3.10	Fire blocking damper, duct, valve bodies, fan housings	Galvanized steel, cast iron	Ambient Air	Loss of Material	Periodic Surveillance and Preventive Maintenance Program (B.2.7)	3.3.1.05	The FCS components are made of the same material, exposed to the same environment, subject to the same aging effects and managed by the same aging management program as the components evaluated in NUREG-1801, Volume 2, VII.F2.1-a.

NEW LRA FORMAT

APPENDIX B

AGING MANAGEMENT PROGRAMS (AMPs)

AMPs are either:

- **Consistent with GALL**
- **Generally consistent with GALL, but with some deviation from GALL**
- **Not consistent with GALL**

Some AMPs are common (i.e., they are credited with managing aging in components in more than 1 system/structural group)

Some AMPs are system group - specific

NEW REVIEW APPROACH

NO CHANGE IN REVIEW APPROACH IN LRA SECTIONS 2 AND 4

SIGNIFICANT CHANGE IN REVIEW APPROACH IN SECTION 3 AND APP. B (APP. B REVIEW RESULTS ARE DOCUMENTED IN SECTION 3 OF THE STAFF SER)

NEW REVIEW APPROACH

STAFF PERFORMS REVIEW IN THREE PARTS

Part 1 - Review of aging management programs

Part 2 - Review of aging management review results in tables

Part 3 - Review of adequacy of aging management

NEW REVIEW APPROACH

APPENDIX B

PART 1 - REVIEW OF AGING MANAGEMENT PROGRAMS

AMPs THAT APPLICANT CLAIMS ARE CONSISTENT WITH GALL

Staff does not review

Claim of consistency is confirmed during the AMR inspection

Reviewer determines whether the FSAR Supplement adequately describes the AMP

B.1.6 INSERVICE INSPECTION PROGRAM 3.1.6

The Inservice Inspection Program is consistent with XI.M1, "*ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD*," and XI.S3, "*ASME Section XI, Subsections IWF*," as identified in NUREG-1801. The scope of the FCS Inservice Inspection Program includes those plant-specific components identified in Tables 3.1.2 and 3.1.3 of this application for which the Inservice Inspection Program is identified as an aging management program.

Operating Experience:

Review of the plant specific operating experience indicates that the FCS Inservice Inspection Program has been effective in managing the aging effects of components. No significant age related deterioration has been identified in the inspections performed.

Conclusion:

The FCS Inservice Inspection Program provides reasonable assurance that the aging effects will be managed such that the ASME Class 1, 2, and 3 components and their integral supports subject to aging management review will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

NEW REVIEW APPROACH

APPENDIX B

PART 1 - REVIEW OF AGING MANAGEMENT PROGRAMS

AMPs THAT APPLICANT CLAIMS ARE CONSISTENT WITH GALL, BUT WITH DEVIATIONS

Reviewer determines:

Whether the deviation is acceptable

Whether the AMP, with the deviation, is adequate to manage the aging for which it is credited

Whether the FSAR Supplement adequately describes the modified AMP

B.2.2 COOLING WATER CORROSION PROGRAM

The FCS Cooling Water Corrosion Program is consistent with XI.M20, "*Open-Cycle Cooling Water System*," and XI.21, "*Closed-Cycle Cooling Water System*," as identified in NUREG-1801, with the exception of the enhancements specified in the following table and with the following clarifications:

- XI.M20 - Program Description, 3. Parameters Monitored/Inspected, 4.Detection of Aging Effects, 5. Monitoring and Trending, and 6. Acceptance Criteria

  External coatings are addressed by the FCS General Corrosion of External Surfaces Program.

- XI.M21 - Program Description, 2. Preventative Actions, 5. Monitoring and Trending, 6. Acceptance Criteria, and 7. Corrective Action

  The Chemistry-related portions of the program are addressed in the FCS Chemistry Program.

- The scope of the FCS Cooling Water Corrosion Program includes those plant specific components identified in Tables 3.2.2, 3.3.2, and 3.3.3 of this application for which the Cooling Water Corrosion Program is identified as an aging management program.

The FCS Cooling Water Corrosion Program will also include the following exceptions to NUREG-1801:

- XI.M21 - 3. Parameters Monitored/Inspected, 4. Detection of Aging Effects, and 5. Monitoring and Trending

  The license renewal commitment for these programs relates only to the maintenance of the pressure boundary and not the maintenance of fluid flow. Fluid flow is considered an active function. Performance testing and other active system function testing is not performed on an 18 month or 5 year frequency in accordance with EPRI TR-107396, Closed Cooling Water Chemistry Guideline, because this EPRI document does not address this criteria or specify that testing frequency. Non-destructive testing and heat transfer performance to identify pressure boundary integrity are performed per EPRI TR-107396.

The following enhancements will be made to the Cooling Water Corrosion Program prior to the period of extended operation.

NUREG-1801 Program	Criteria	Enhancement
XI.M20, Open-Cycle Cooling Water System	1. Scope of Program 4. Detection of Aging Effects 5. Monitoring and Trending	Inspections to various raw water components will be added based on FCS' Cooling Water Corrosion Program susceptibility evaluation. These inspection activities will be commensurate with the GALL Program.
XI.M21, Closed-Cycle Cooling Water System	3. Parameters Monitored/ Inspected 4. Detection of Aging Effects	Inspections to various cooling water components will be added based on FCS' Cooling Water Corrosion Program susceptibility evaluation. These inspection activities will be commensurate with the GALL Program.

Operating Experience:

Review of FCS operating experience has identified some component part replacements (and repairs) due to corrosion and cracking in the Component Cooling Water and Raw Water Systems. Appropriate long term corrective actions were implemented based on these experiences. These included material changes, additional preventive maintenance, and increased sample evaluation.

Conclusion:

The FCS Cooling Water Corrosion Program provides reasonable assurance that the aging effects will be managed such that the components subject to aging management review will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

NEW REVIEW APPROACH

APPENDIX B

PART 1 - REVIEW OF AGING MANAGEMENT PROGRAMS

AMPs THAT ARE NOT CONSISTENT WITH GALL

Reviewer performs a review of the 10 program elements in accordance with Branch Technical Position RLSB-1, in the SRP-LR

Reviewer determines whether the FSAR SUPPLEMENT adequately describes the AMP

B.2.7 PERIODIC SURVEILLANCE AND PREVENTIVE MAINTENANCE (PM) PROGRAM

3.1.19

The stated purpose of the PM program is to prevent or minimize equipment breakdown and to maintain equipment in a condition that will enable it to perform its normal and emergency functions. The program and the site administrative control processes provide for a systematic approach in establishing the method, frequency, acceptance criteria, and documentation of results.

The FCS Periodic Surveillance and Preventive Maintenance Program consists of periodic inspections and tests that are relied on to manage aging for system and structural components and that are not evaluated as part of the other aging management programs addressed in this appendix. The preventive maintenance and surveillance testing activities are implemented through periodic work orders that provide for assurance of functionality of the components by confirmation of integrity of applicable parameters.

EVALUATION AND TECHNICAL BASIS

(1) Scope of Program:

The FCS Periodic Surveillance and Preventive Maintenance Program provides for periodic inspection and testing of components in the following systems and structures.

- Auxiliary Building
- Auxiliary Building HVAC
- Auxiliary Feedwater
- Chemical and Volume Control
- Component Cooling
- Containment
- Containment HVAC
- Control Room HVAC and Toxic Gas Monitoring
- Diesel Generator Lube Oil
- Duct Banks
- Emergency Diesel Generators
- Fire Protection
- Fuel Handling Equipment/Heavy Load Cranes
- Intake Structure
- Liquid Waste Disposal
- Containment Penetration, and System Interface Components for Non-CQE Systems
- Reactor Coolant
- Safety Injection and Containment Spray
- Ventilating Air

(2) Preventive Actions:

The Periodic Surveillance and Preventive Maintenance Program includes periodic refurbishment or replacement of components, which could be considered to be preventive or mitigative actions. The inspections and testing to identify component aging degradation effects do not constitute preventive actions in the context of this element.

(3) Parameters Monitored or Inspected:

Inspection and testing activities monitor parameters including surface condition, loss of material, presence of corrosion products, signs of cracking and presence of water in oil samples.

(4) Detection of Aging Effects:

Preventive maintenance and surveillance testing activities provide for periodic component inspections and testing to detect the following aging effects and mechanisms:

- Change in Material Properties
- Cracking
- Fouling
- Loss of Material
- Loss of Material - Crevice Corrosion
- Loss of Material - Fretting
- Loss of Material - General Corrosion
- Loss of Material - Pitting Corrosion
- Loss of Material - Pitting/ Crevice/Gen. Corrosion
- Loss of Material - Wear
- Separation

The extent and schedule of the inspections and testing assures detection of component degradation prior to the loss of their intended functions. Established techniques such as visual inspections and dye penetrant testing are used.

(5) Monitoring and Trending:

Preventive maintenance and surveillance testing activities provide for monitoring and trending of aging degradation. Inspection intervals are established such that they provide for timely detection of component degradation. Inspection intervals are dependent on the component material and environment and take into consideration industry and plant-specific operating experience and manufacturers' recommendations.

The program includes provisions for monitoring and trending with the stated intent of identifying potential failures or degradation and making adjustments to ensure components

remain capable of performing their functions. PM review and update guidelines are provided that include adjustment of PM task and frequency based on the as-found results of previous performance of the PM. In particular, responsible system engineers are required to periodically review the results of preventive maintenance and recommend changes based on these reviews. The program includes guidance to assist the system engineers in achieving efficient and effective trending.

(6) Acceptance Criteria:

Periodic Surveillance and Preventive Maintenance Program acceptance criteria are defined in the specific inspection and testing procedures. They confirm component integrity by verifying the absence of the aging effect or by comparing applicable parameters to limits based on the applicable intended function(s) as established by the plant design basis.

(7) Corrective Actions:

Identified deviations are evaluated within the FCS corrective action process, which includes provisions for root cause determinations and corrective actions to prevent recurrence as dictated by the significance of the deviation. The FCS corrective action process is in accordance with 10 CFR 50 Appendix B.

(8) Confirmation Process:

The FCS corrective action process is in accordance with 10 CFR 50 Appendix B and includes:

- Reviews to assure that proposed actions are adequate;
- Tracking and reporting of open corrective actions; and
- For root cause determinations, reviews of corrective action effectiveness.

(9) Administrative Controls:

All credited aging management activities are subject to the FCS administrative controls process, which is in accordance with 10 CFR 50 Appendix B and requires formal reviews and approvals.

(10) Operating Experience:

Periodic surveillance and preventive maintenance activities have been in place at FCS since the plant began operation. These activities have a demonstrated history of detecting damaged and degraded components and causing their repair or replacement in accordance with the site corrective action process. With few exceptions, age-related degradation adverse to component intended functions was discovered and corrective actions were taken prior to loss of intended function.

Conclusion:

The Periodic Surveillance and Preventive Maintenance Program assures that various aging effects are managed for a wide range of components at FCS. Based on the program structure and administrative processes and FCS operating experience, there is reasonable assurance that the credited inspection and testing activities of the Periodic Surveillance and Preventive Maintenance Program will continue to adequately manage the identified aging effects of the applicable components so that the intended functions will be maintained consistent with the current licensing basis for the period of extended operation.

NEW REVIEW APPROACH

SECTION 3

PART 2 - REVIEW OF AGING MANAGEMENT REVIEW RESULTS IN TABLES

REVIEWER EVALUATES INFORMATION PROVIDED IN THE SECTION 3 TABLES

3.X-1 TABLES

Two types of information

1. **Assessment of SCs that are consistent with the GALL evaluation, and for which GALL does not recommend further evaluation**

NEW REVIEW APPROACH

SECTION 3

PART 2 - REVIEW OF AGING MANAGEMENT REVIEW RESULTS IN TABLES

2. Assessment of SCs that are consistent with GALL, but GALL recommends further evaluation

NEW REVIEW APPROACH

SECTION 3

PART 2 - REVIEW OF AGING MANAGEMENT REVIEW RESULTS IN TABLES

ASSESSMENT OF STRUCTURES AND COMPONENTS (SCs) THAT ARE CONSISTENT WITH THE GALL EVALUATION, AND FOR WHICH GALL DOES NOT RECOMMEND FURTHER EVALUATION

Reviewer does not review

Consistency is confirmed during the AMR inspection

Reviewers can request the inspectors to look at specific items during the inspection

NEW REVIEW APPROACH

SECTION 3

PART 2 - REVIEW OF AGING MANAGEMENT REVIEW RESULTS IN TABLES

ASSESSMENT OF SCs THAT ARE CONSISTENT WITH GALL, BUT GALL RECOMMENDS FURTHER EVALUATION

Reviewer does not review claim of consistency

Consistency is confirmed during the AMR inspection

Reviewer focuses review on issues that for which GALL recommends further evaluation

TABLE 3.3-1
SUMMARY OF AGING MANAGEMENT PROGRAMS FOR AUXILIARY SYSTEMS EVALUATED IN NUREG-1801 THAT ARE RELIED ON FOR FCS LICENSE RENEWAL

Row Number	Component	Aging Effect/ Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1.01	Components in spent fuel pool cooling and cleanup	Loss of material due to general, pitting, and crevice corrosion	Water chemistry and one-time inspection	Yes, detection of aging effects is to be further evaluated	The material identified in NUREG-1801 is not applicable to FCS. These components are addressed in Section 3.3.2 of this application.
3.3.1.02	Linings in spent fuel pool cooling and cleanup system; seals and collars in ventilation systems	Hardening, cracking and loss of strength due to elastomer degradation; loss of material due to wear	Plant specific	Yes, plant specific	1. The FCS aging management review results are consistent with those reviewed and approved in NUREG-1801. 2. The General Corrosion of External Surfaces Program (B.3.3) manages this aging effect. This program is described in Appendix B of this application. 3. Consistent with NUREG-1801, this group only includes elastomer seals in the ventilation systems exposed to ambient air at FCS.
3.3.1.03	Components in load handling, chemical and volume control system (PWR), and reactor water cleanup and shutdown cooling systems (older BWR)	Cumulative fatigue damage	TLAA, evaluated in accordance with 10 CFR 54.21(c)	Yes, TLAA	1. The FCS aging management review results are consistent with those reviewed and approved in NUREG-1801 for the chemical and volume control and primary sampling systems. 2. The metal fatigue time limited aging analyses are discussed in Section 4.3.1 of this application.

NEW REVIEW APPROACH

SECTION 3

PART 2 - REVIEW OF AGING MANAGEMENT REVIEW RESULTS IN TABLES

3.X-2 TABLES

Contain assessments of SCs not evaluated in GALL

Reviewer performs traditional pre-GALL review

TABLE 3.3-2 (CONTINUED)
FCS AUXILIARY SYSTEMS COMPONENT TYPES SUBJECT TO AGING MANAGEMENT NOT EVALUATED IN NUREG-1801

Row Number	Component Types	Material	Environment	AERMs	Program/Activity
3.3.2.74	Flow element/orifice body; indicator/recorder housing, orifice plate, pipes & fittings, valve bodies, heat exchanger - tubes	Stainless Steel	Corrosion-Inhibited Treated Water	Cracking Due to exposure to halogens and sulfates	Chemistry Program (B.1.2) and Cooling Water Corrosion Program (B.2.2)
3.3.2.75	External surfaces of stainless steel componenets	Stainless Steel	Ambient Air	None	Not Applicable
3.3.2.76	Heat exchanger - tubes	Stainless Steel	Oxygenated Treated Water <200 deg F	Loss of Material • Crevice corrosion due to an oxygenated treated water environment • Pitting corrosion due to exposure to halogens and sulfates	Chemistry Program (B.1.2) and Cooling Water Corrosion Program (B.2.2)
3.3.2.77	Filter strainer housing	Stainless Steel	Raw Water	Loss of Material • Crevice corrosion due to the presence of dis-solved oxygen and impurities • MIC due to exposure to microbiological activity • Pitting corrosion due to exposure to halide ions	Periodic Surveillance and Preventive Maintenance Program (B.2.7)
3.3.2.78	Not used in application				
3.3.2.79	Glass in metal fire penetration barriers	Glass	Ambient Air	None	Not Applicable

NEW REVIEW APPROACH

SECTION 3

PART 2 - REVIEW OF AGING MANAGEMENT REVIEW RESULTS IN TABLES

3.X-3 TABLES (FT. CALHOUN ONLY)

SCs not evaluated in GALL, but GALL could be credited with managing aging of the SCs

Reviewer determines if GALL can be credited with managing aging of the SCs

Note: **For GALL plants after Ft. Calhoun, 3.X-3 information is integrated into the 3.X-1 or 3.X-2 tables**

TABLE 3.3-3 (CONTINUED)
COMPONENTS IN AUXILIARY SYSTEMS NOT EVALUATED IN NUREG-1801 THAT RELY ON AGING MANAGEMENT PROGRAMS IN NUREG-1801 FOR FCS LICENSE RENEWAL

Row Number	FCS Components	FCS Material	FCS Environment	FCS AERMs	FCS Program Activity	Applicable NUREG-1801 Aging Management Review Results Row Number	Justification for applying NUREG-1801 Aging Management Review Results
3.3.3.07	Valve bodies, piping & fittings, fan housings, bolts, duct, pumps	Cast Iron, cadmium plated steel, galvanized steel	Ambient Air	Loss of Material	General Corrosion of Ext. Surfaces Program (B.3.3)	3.3.1.05	The material is subject to the same environment and aging effect, and managed by the same aging management program as evaluated in Table 3.3-1, Item 3.3.1.05. The aging effect is independent of component type.
3.3.3.08	Electric heater sleeves, tanks, heat exchanger, orifice,	Carbon Steel	Corrosion-Inhibited Treated Water	Loss of Material	Chemistry Program (B.1.2) and Cooling Water Corrosion Program (B.2.2)	3.3.1.14	The FCS components are made of the same material, exposed to the same environment, subject to the same aging effects and managed by the same aging management program as the components evaluated in NUREG-1801, Volume 2, VII.H2.1-a and VII.C2.5-a.

NEW REVIEW APPROACH

SECTION 3

PART 3 - REVIEW OF ADEQUACY OF AGING MANAGEMENT

THIS PART OF THE REVIEW IS REQUIRED TO ENSURE COMPLIANCE WITH THE RULE!!!

Reviewer must determine whether SCs will be adequately managed

This requires tracking the aging management information for each SC from Section 2, through Section 3, to the AMP that is being credited for aging management

The component links are used to perform this portion of the review

NEW REVIEW APPROACH

SECTION 3

PART 3 - REVIEW OF ADEQUACY OF AGING MANAGEMENT

AMR reviewer must communicate with the AMP reviewer to ensure that the components will be adequately managed

TABLE 2.3.3.12-1
CONTROL ROOM HVAC AND TOXIC GAS MONITORING
Component Types Subject to Aging Management Review and Intended Functions

Component Type	Intended Functions	Aging Management Review Results
Blower & Fan Housing	Pressure Boundary	3.3.1.05 3.3.3.07 3.3.3.10
Bolting	Pressure Boundary	3.3.1.05 3.3.3.07 3.3.2.75
Duct	Pressure Boundary	3.3.1.02 3.3.1.05 3.3.3.07 3.3.3.10
Filter/Strainer	Pressure Boundary Filtration	3.3.1.05 3.3.2.75
Heat Exchanger	Pressure Boundary/Heat Transfer	3.3.1.05 3.3.2.29 3.3.2.39 3.3.2.40
Pipes & Fittings	Pressure Boundary	3.3.1.05 3.3.1.14 3.3.2.38 3.3.2.40 3.3.2.75 3.3.2.91
Valve Bodies	Pressure Boundary	3.3.1.05 3.3.2.01 3.3.2.10 3.3.2.15 3.3.2.28 3.3.2.29 3.3.2.38 3.3.2.75 3.3.3.07

TABLE 3.3-1 (CONTINUED)
SUMMARY OF AGING MANAGEMENT PROGRAMS FOR AUXILIARY SYSTEMS EVALUATED IN NUREG-1801 THAT ARE RELIED ON FOR FCS LICENSE RENEWAL

Row Number	Component	Aging Effect/ Mechanism	Aging Management Programs	Further Evaluation Recommended	Discussion
3.3.1.05	Components in ventilation systems, diesel fuel oil system, and emergency diesel generator systems; external surfaces of carbon steel components	Loss of material due to general, pitting, and crevice corrosion, and MIC	Plant specific	Yes, plant specific	1. The FCS aging management review results are consistent with those reviewed and approved in NUREG-1801. 2. The Periodic Surveillance and Preventive Maintenance (B.2.7), General Corrosion of External Surfaces (B.3.3), and Fire Protection Programs (B.2.5) manage this aging effect. These programs are described in Appendix B of this application. The FCS Fire Protection Program provides guidance for detecting loss of material due to general, pitting, crevice, and microbiologically influenced corrosion (MIC). 3. Consistent with NUREG-1801, this group includes carbon steel, galvanized steel, and copper in air, and carbon steel in diesel engine exhaust gases at FCS.

Table 3.3-1. Summary of Aging Management Programs for Auxiliary Systems Evaluated in Chapter VII of the GALL Report

Type	Component	Aging Effect/ Mechanism	Aging Management Programs	Further Evaluation Recommended
BWR/PWR	Components in spent fuel pool cooling and cleanup	Loss of material due to general, pitting, and crevice corrosion	Water chemistry and one-time inspection	Yes, detection of aging effects is to be further evaluated (see subsections 3.3.2.2.1.1 and 3.3.2.2.1.2)
BWR/PWR	Linings in spent fuel pool cooling and cleanup system; seals and collars in ventilation systems	Hardening, cracking and loss of strength due to elastomer degradation; loss of material due to wear	Plant specific	Yes, plant specific (see subsection 3.3.2.2.2)
BWR/PWR	Components in load handling, chemical and volume control system (PWR), and reactor water cleanup and shutdown cooling systems (older BWR)	Cumulative fatigue damage	TLAA, evaluated in accordance with 10 CFR 54.21(c)	Yes, TLAA (see subsection 3.3.2.2.3)
BWR/ PWR	Heat exchangers in reactor water cleanup system (BWR); high pressure pumps in chemical and volume control system (PWR)	Crack initiation and growth due to SCC or cracking	Plant specific	Yes, plant specific (see subsection 3.3.2.2.4)
BWR/PWR	Components in ventilation systems, diesel fuel oil system, and emergency diesel generator systems; external surfaces of carbon steel components	Loss of material due to general, pitting, and crevice corrosion, and MIC	Plant specific	Yes, plant specific (see subsection 3.3.2.2.5)
BWR/PWR	Components in reactor coolant pump oil collect system of fire protection	Loss of material due to galvanic, general, pitting, and crevice corrosion	One-time inspection	Yes, detection of aging effects is to be further evaluated (see subsection 3.3.2.2.6)
BWR/PWR	Diesel fuel oil tanks in diesel fuel oil system and emergency diesel generator system	Loss of material due to general, pitting, and crevice corrosion, MIC, and biofouling	Fuel oil chemistry and one-time inspection	Yes, detection of aging effects is to be further evaluated (see subsection 3.3.2.2.7)

Acceptance criteria are described in Branch Technical Position RLSB-1 (Appendix A.1, of this standard review plan.)

3.3.2.2.3 Cumulative Fatigue Damage

Fatigue is a TLAA as defined in 10 CFR 54.3. TLAAs are required to be evaluated in accordance with 10 CFR 54.21(c). The evaluation of this TLAA is addressed separately in Section 4.3 of this standard review plan.

3.3.2.2.4 Crack Initiation and Growth due to Cracking or Stress Corrosion Cracking

Crack initiation and growth due to SCC could occur in the regenerative and non-regenerative heat exchanger components in the reactor water cleanup system (BWR) and due to cracking in the high-pressure pump in the chemical and volume control system (PWR). The GALL report recommends further evaluation to ensure that these aging effects are managed adequately. Acceptance criteria are described in Branch Technical Position RLSB-1 (Appendix A.1, of this standard review plan.)

3.3.2.2.5 Loss of Material due to General, Microbiologically Influenced, Pitting, and Crevice Corrosion

Loss of material due to general, pitting, and crevice corrosion could occur in the piping and filter housing and supports in the control room area, the auxiliary and radwaste area, the primary containment heating and ventilation systems, in the piping of the diesel generator building ventilation system, in the aboveground piping and fittings, valves, and pumps in the diesel fuel oil system and in the diesel engine starting air, combustion air intake, and combustion air exhaust subsystems in the emergency diesel generator system. Loss of material due to general, pitting, crevice, and microbiologically influenced corrosion (MIC) could occur in the duct fittings, access doors, and closure bolts, equipment frames and housing of the duct, due to pitting and crevice corrosion could occur in the heating/cooling coils of the air handler heating/cooling, and due to general corrosion could occur on the external surfaces of all carbon steel structures and components, including bolting exposed to operating temperatures less than 212°F in the ventilation systems. The GALL report recommends further evaluation to ensure that these aging effects are adequately managed. Acceptance criteria are described in Branch Technical Position RLSB-1 (Appendix A.1, of this standard review plan.)

3.3.2.2.6 Loss of Material due to General, Galvanic, Pitting, and Crevice Corrosion

Loss of material due to general, galvanic, pitting, and crevice corrosion could occur in tanks, piping, valve bodies, and tubing in the reactor coolant pump oil collection system in fire protection. The fire protection program relies on a combination of visual and volumetric examinations in accordance with the guidelines of 10 CFR Part 50 Appendix R and Branch Technical Position 9.5-1 to manage loss of material from corrosion. However, corrosion may occur at locations where water from wash downs may accumulate. Therefore, verification of the effectiveness of the program should be performed to ensure that corrosion is not occurring. The GALL report recommends further evaluation of programs to manage loss of material due to general, galvanic, pitting, and crevice corrosion to verify the effectiveness of the program. A one-time inspection of the bottom half of the interior surface of the tank of the reactor coolant pump oil collection system is an acceptable method to ensure that corrosion is not occurring and that the component's intended function will be maintained during the period of extended operation.

B.2.7 PERIODIC SURVEILLANCE AND PREVENTIVE MAINTENANCE (PM) PROGRAM

3.1.19

The stated purpose of the PM program is to prevent or minimize equipment breakdown and to maintain equipment in a condition that will enable it to perform its normal and emergency functions. The program and the site administrative control processes provide for a systematic approach in establishing the method, frequency, acceptance criteria, and documentation of results.

The FCS Periodic Surveillance and Preventive Maintenance Program consists of periodic inspections and tests that are relied on to manage aging for system and structural components and that are not evaluated as part of the other aging management programs addressed in this appendix. The preventive maintenance and surveillance testing activities are implemented through periodic work orders that provide for assurance of functionality of the components by confirmation of integrity of applicable parameters.

EVALUATION AND TECHNICAL BASIS

(1) Scope of Program:

The FCS Periodic Surveillance and Preventive Maintenance Program provides for periodic inspection and testing of components in the following systems and structures.

- Auxiliary Building
- Auxiliary Building HVAC
- Auxiliary Feedwater
- Chemical and Volume Control
- Component Cooling
- Containment
- Containment HVAC
- Control Room HVAC and Toxic Gas Monitoring
- Diesel Generator Lube Oil
- Duct Banks
- Emergency Diesel Generators
- Fire Protection
- Fuel Handling Equipment/Heavy Load Cranes
- Intake Structure
- Liquid Waste Disposal
- Containment Penetration, and System Interface Components for Non-CQE Systems
- Reactor Coolant
- Safety Injection and Containment Spray
- Ventilating Air

B.3.3 GENERAL CORROSION OF EXTERNAL SURFACES PROGRAM

3.1.20

The General Corrosion of External Surfaces Program at FCS is credited for aging management of the effects of loss of material and cracking for applicable components, including piping, valves, supports, tanks, and bolting, which are made of cadmium plated steel, carbon steel, cast iron, copper alloy, galvanized steel, low alloy steel, and neoprene.

(1) Scope of Program

The General Corrosion of External Surfaces Program consists of several FCS activities that manage the aging effects of loss of material and cracking for components in the following systems:

- Auxiliary Boiler Fuel Oil
- Auxiliary Building HVAC
- Auxiliary Feedwater (AFW)
- Chemical and Volume Control
- Component Cooling Water (CCW)
- Containment HVAC
- Control Room HVAC
- Diesel Generator Lube Oil
- Diesel Jacket Water
- Starting Air
- Feedwater
- Fire Protection Fuel Oil
- Gaseous Waste Disposal
- Instrument Air
- Main Steam (MS) and Turbine Steam Extraction
- Containment Penetration, and System Interface Components for Non-CQE Systems
- Nitrogen Gas
- Primary Sampling
- Raw Water
- Ventilating Air

(2) Preventive Actions

This program does not prevent aging.

(3) Parameters Monitored or Inspected

Surface conditions of components are monitored through visual observation and inspection to detect signs of external corrosion and to detect conditions that can result in external corrosion, such as fluid leakage.

F1. CONTROL ROOM AREA VENTILATION SYSTEM

F1.1 Duct

- F1.1.1 Duct Fittings, Access Doors, and Closure Bolts
- F1.1.2 Equipment Frames and Housing
- F1.1.3 Flexible Collars between Ducts and Fans
- F1.1.4 Seals in Dampers and Doors

F1.2 Air Handler Heating/Cooling

- F1.2.1 Heating/Cooling Coils

F1.3 Piping

- F1.3.1 Piping and Fittings

F1.4 Filters

- F1.4.1 Housing and Supports
- F1.4.2 Elastomer Seals

F1. CONTROL ROOM AREA VENTILATION SYSTEM

Systems, Structures, and Components

This section comprises the control room area ventilation system (with warm moist air as the normal environment), which contains ducts, piping and fittings, equipment frames and housings, flexible collars and seals, filters, and heating and cooling air handlers. Based on Regulatory Guide 1.26, "Quality Group Classifications and Standards for Water, Steam, and Radioactive-Waste-Containing Components of Nuclear Power Plants," all components that comprise the control room area ventilation system are governed by Group B Quality Standards.

With respect to filters and seals, these items are to be addressed consistent with the NRC position on consumables, provided in the NRC letter from Christopher I. Grimes to Douglas J. Walters of NEI, dated March 10, 2000. Specifically, components that function as system filters and seals are typically replaced based on performance or condition monitoring that identifies whether these components are at the end of their qualified lives and may be excluded, on a plant-specific basis, from an aging management review under 10 CFR 54.21(a)(1)(ii). The application is to identify the standards that are relied on for replacement as part of the methodology description, for example, NFPA standards for fire protection equipment.

Aging management programs for the degradation of external surfaces of carbon steel components are included in VII.I.

The system piping includes all pipe sizes, including instrument piping.

System Interfaces

The system that interfaces with the control room area ventilation system is the auxiliary and radwaste area ventilation system (VII.F2). The cooling coils receive their cooling water from other systems, such as the hot water heating system or the chilled water cooling system.

Table 3. Summary of Aging Management Programs for the Auxiliary Systems Evaluated in Chapter VII of the GALL Report (continued)

Type	Component	Aging Effect/ Mechanism	Aging Management Programs	Further Evaluation Recommended	Item Number in GALL
BWR/ PWR	Components in ventilation systems, diesel fuel oil system, and emergency diesel generator systems; external surfaces of carbon steel components	Loss of material due to general, pitting, and crevice corrosion, and MIC	Plant specific	Yes, plant specific	VII.F1.1-a, VII.F1.2-a, VII.F1.4-a, VII.F2.1-a, VII.F2.2-a, VII.F2.4-a, VII.F3.1-a, VII.F3.2-a, VII.F3.4-a, VII.F4.1-a, VII.F4.2-a, VII.H1.1-a, VII.H1.2-a, VII.H1.3-a, VII.H2.2-a, VII.H2.3-a, VII.H2.4-a, VII. I1-b.
BWR/ PWR	Components in reactor coolant pump oil collect system of fire protection	Loss of material due to galvanic, general, pitting, and crevice corrosion	One-time inspection	Yes, detection of aging effects is to be further evaluated	VII.G.7-a, VII.G.7-b.
BWR/ PWR	Diesel fuel oil tanks in diesel fuel oil system and emergency diesel generator system	Loss of material due to general, pitting, and crevice corrosion, MIC, and biofouling	Fuel oil chemistry and one-time inspection	Yes, detection of aging effects is to be further evaluated	VII.H1.4-a, VII.H2.5-a.
BWR	Piping, pump casing, and valve body and bonnets in shutdown cooling system (older BWR)	Loss of material due to pitting and crevice corrosion	Water chemistry and one-time inspection	Yes, detection of aging effects is to be further evaluated	VII.E4.1-a, VII.E4.2-a.
PWR	Heat exchangers in chemical and volume control system	Crack initiation and growth due to SCC and cyclic loading	Water chemistry and a plant-specific verification program	Yes, plant specific	VII.E1.7-c, VII.E1.8-b.
BWR/ PWR	Neutron absorbing sheets in spent fuel storage racks	Reduction of neutron absorbing capacity and loss of material due to general corrosion (Boral, boron steel)	Plant specific	Yes, plant specific	VII.A2.1-b.

VII Auxiliary Systems
F1. Control Room Area Ventilation System

Item	Structure and/or Component	Material	Environment	Aging Effect/ Mechanism	Aging Management Program (AMP)	Further Evaluation
F1.1-a F1.1.1 F1.1.2	Duct Duct fittings, access doors, and closure bolts Equipment frames and housing	Carbon steel (galvanized or painted) bolts: plated carbon steel	Warm, moist air	Loss of material/ General, pitting, crevice corrosion, and microbiologically influenced corrosion (for duct [drip-pan] and piping for moisture drainage)	A plant-specific aging management program is to be evaluated.	Yes, plant specific
F1.1-b F1.1.3 F1.1.4	Duct Flexible collars between ducts and fans Seals in dampers and doors	Elastomer (Neoprene)	Warm, moist air	Hardening and loss of strength/ Elastomer degradation	A plant-specific aging management program is to be evaluated.	Yes, plant specific
F1.1-c F1.1.3 F1.1.4	Duct Flexible collars between ducts and fans Seals in dampers and doors	Elastomer (Neoprene)	Warm, moist air	Loss of material/ Wear	A plant-specific aging management program is to be evaluated.	Yes, plant specific
F1.2-a F1.2.1	Air handler heating/ cooling Heating/ cooling coils	Copper/ nickel	Warm, moist air	Loss of material/ Pitting and crevice corrosion	A plant-specific aging management program is to be evaluated.	Yes, plant specific
F1.3-a F1.3.1	Piping Piping and fittings	Carbon steel	Hot or cold treated water	Loss of material/ General, pitting, crevice corrosion	Chapter XI.M21, "Closed-Cycle Cooling Water System"	No
F1.4-a F1.4.1	Filters Housing and supports	Carbon steel, stainless steel	Warm, moist air	Loss of material/ General (only for carbon steel), pitting, and crevice corrosion	A plant-specific aging management program is to be evaluated.	Yes, plant specific
F1.4-b F1.4.2	Filters Elastomer seals	Elastomers (Neoprene and similar materials)	Warm, moist air	Hardening and loss of strength/ Elastomer degradation	A plant-specific aging management program is to be evaluated.	Yes, plant specific

TABLE 3.3-3 (CONTINUED)
COMPONENTS IN AUXILIARY SYSTEMS NOT EVALUATED IN NUREG-1801 THAT RELY ON AGING MANAGEMENT PROGRAMS IN NUREG-1801 FOR FCS LICENSE RENEWAL

Row Number	FCS Components	FCS Material	FCS Environment	FCS AERMs	FCS Program Activity	Applicable NUREG-1801 Aging Management Review Results Row Number	Justification for applying NUREG-1801 Aging Management Review Results
3.3.3.07	Valve bodies, piping & fittings, fan housings, bolts, duct, pumps	Cast Iron, cadmium plated steel, galvanized steel	Ambient Air	Loss of Material	General Corrosion of Ext. Surfaces Program (B.3.3)	3.3.1.05	The material is subject to the same environment and aging effect, and managed by the same aging management program as evaluated in Table 3.3-1, Item 3.3.1.05. The aging effect is independent of component type.
3.3.3.08	Electric heater sleeves, tanks, heat exchanger, orifice,	Carbon Steel	Corrosion-Inhibited Treated Water	Loss of Material	Chemistry Program (B.1.2) and Cooling Water Corrosion Program (B.2.2)	3.3.1.14	The FCS components are made of the same material, exposed to the same environment, subject to the same aging effects and managed by the same aging management program as the components evaluated in NUREG-1801, Volume 2, VII.H2.1-a and VII.C2.5-a.

TABLE 3.3-2 (CONTINUED)
FCS AUXILIARY SYSTEMS COMPONENT TYPES SUBJECT TO AGING MANAGEMENT NOT EVALUATED IN NUREG-1801

Row Number	Component Types	Material	Environment	AERMs	Program/Activity
3.3.2.27	Heat exchanger - shell	Carbon Steel	Oxygenated Treated Water <200 deg F	Loss of Material • General and crevice corrosion due to dissolved oxygen • Pitting corrosion due to halogens • Galvanic corrosion due to the conductivity of the process fluid and the presence of dissimilar metals in contact	Chemistry Program (B.1.2) and Cooling Water Corrosion Program (B.2.2)
3.3.2.28	Valve bodies	Cast Iron	Gas - Refrigerant (Liquid)	None	Not Applicable
3.3.2.29	Pump casings, valve bodies, pipes & fittings, heat exchanger - channel/channel head	Cast Iron	Corrosion-Inhibited Treated Water	Loss of Material • General and crevice corrosion due to the exposure of cast iron to dissolved oxygen • Pitting corrosion due to exposure to halogens	Chemistry Program (B.1.2) and Cooling Water Corrosion Program (B.2.2)
3.3.2.30	Pump casings, valve bodies, pipes & fittings	Cast Iron	Corrosion-Inhibited Treated Water	Loss of Material Selective leaching due to the exposure of cast iron to dissolved oxygen	Selective Leaching Program (B.3.6)

NEW DOCUMENTATION OF STAFF REVIEW RESULTS

STAFF HAS DEVELOPED AN SER TEMPLATE TO AID IN THE PERFORMANCE AND DOCUMENTATION OF THE STAFF'S REVIEW

- **The template contains boilerplate language (pre-approved by OGC)**
- **Includes 3.X-1 tables to conveniently summarize the GALL review results**
- **Template will be revised based on lessons learned from Ft. Calhoun review**

omitted from the scope of the Rule. The staff also focused on components that were not identified as being subject to an AMR to determine if any components were omitted.

[I HAVE NO SPECIFIC FORMAT HERE. THE TECHNICAL LEAD SHOULD MAKE SURE THAT THERE IS A CONSISTENT FORMAT FOR EACH SYSTEM WRITEUP. SEE 2.3.4 ABOVE FOR GUIDANCE]

2.5.20.3 Conclusions

The staff reviewed the LRA and to determine whether any structures, systems, or components that should be within the scope of license renewal were not identified by the applicant. No omissions were found. In addition, the staff performed an independent assessment to determine whether any components that should be subject to an AMR were not identified by the applicant. No omissions were found. On the basis of this review, the staff concludes that [*pending satisfactory resolution of Open Items XXXXX*], there is reasonable assurance that the applicant has adequately identified the bus bar components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and that the applicant has adequately identified the bus bar components that are subject to an aging management review, as required by 10 CFR 54.21(a)(1).

2.5.21 Evaluation Findings

On the basis of this review, the staff concludes that [*pending satisfactory resolution of Open Items XXXXX*], there is reasonable assurance that the applicant has adequately identified the electrical systems and components that are within the scope of license renewal, in accordance with the requirements of 10 CFR 54.4(a), and that the applicant has adequately identified the electrical systems components that are subject to an aging management review, in accordance with the requirements of 10 CFR 54.21(a)(1).

2.5.22 References

3.0 AGING MANAGEMENT REVIEW

OPPD is the first license renewal applicant to fully utilize the Generic Aging Lessons Learned (GALL) process. The purpose of GALL is to provide the staff with a summary of staff-approved AMPs for the aging of most structures and components that are subject to an AMR. If an applicant commits to implementing these staff-approved AMPs, the time, effort, and resources used to review an applicant's LRA will be greatly reduced, thereby improving the efficiency and effectiveness of the license renewal review process. The GALL report is a compilation of existing programs and activities used by commercial nuclear power plants to manage the aging of structures and components within the scope of license renewal and which are subject to an AMR. The GALL report summarizes the aging management evaluations, programs, and activities credited for managing aging for most of the structures and components used throughout the industry, and serves as a reference for both applicants and staff reviewers to quickly identify those aging management programs and activities that the staff has determined will provide adequate aging management during the period of extended operation.

The GALL report identifies (1) systems, structures, and components, (2) component materials, (3) the environments to which the components are exposed, (4) the aging effects associated with the materials and environments, (5) the AMPs that are credited with managing the aging effects, and (6) recommendations for further applicant evaluations of aging effects and their management for certain specific components types.

In order to determine whether the GALL process would improve the efficiency of the license renewal review, the staff conducted a demonstration project to exercise the GALL process and determine the format and content of a safety evaluation based on the GALL review process. The SRP-LR was prepared based on both the GALL model and the lessons learned from the demonstration project.

3.0.1 The GALL Format for the LRA

The FCS LRA closely follows the standard LRA format, as agreed between NEI and the staff (see letters dated August 9, 1999 and September 22, 1999). This format has been used by previous applicants and will continue to be used by future applicants. However, there are several important changes within the format that reflect the GALL process. First, the tables in LRA Section 2 that identify the structures and components that are subject to an AMR now include a third column which links plant-specific structures and components in the Section 2 tables to generic GALL component groups in Section 3 (this is discussed in more detail below). Second, the tables in LRA Section 3 are different from the Section 3 tables used in previous LRAs. There are no system-specific tables in Section 3 of the FCS LRA. The individual components within a system have been included in a series of system group tables. For example, there are 20 auxiliary systems at FCS. Each system has several components. In previous LRAs, each system had a separate table that listed the components in the system. With the FCS LRA, there are no system tables. Instead all the components in the 20 auxiliary systems are included in any one of three auxiliary system tables. LRA Table 3.3-1 consists of auxiliary system components evaluated in the GALL report, LRA Table 3.3-2 consists of FCS auxiliary systems components not evaluated in the GALL report, and LRA Table 3.3-3 consists of FCS auxiliary systems components that were not evaluated in the GALL report, but the applicant has determined can be managed using a GALL AMR and associated AMP. Similarly, the LRA tables for the other system groups (3.1 - reactor systems, 3.2 - engineered safety feature systems, 3.4 - steam and power conversion systems, 3.5 - structures, and 3.6 - electrical systems) have 3.x-1 LRA tables for components evaluated in the GALL report, 3.x-2 LRA tables for components not evaluated in the GALL report, and 3.x-3 LRA tables for components that were not evaluated in the GALL report, but the applicant has determined can be managed using a GALL AMR and associated AMP.

The 3.x-1 LRA tables have 6 columns. Column 1 identifies the system group, table number, and row number in the table. For example, 3.1.1.1 identifies Table 3.1-1, row 1. This information is repeated in the last column of the Section 2 tables, and allows the staff reviewer to link each plant-specific structure and component identified in the Section 2 tables to the generic structure and component types identified in the Section 3 tables. Column 2 of the 3.x-1 LRA tables lists the generic structure and component types evaluated in GALL. Column 3 identifies the applicable aging effects experienced by the structure or component. Column 4 identifies the AMP that the GALL report credits for managing the aging effect identified in Column 3. Column 5 indicates whether the GALL report recommends further evaluation of the

management of the aging effect(s). Column 6 provides plant-specific information regarding management of the aging effect(s). Columns 2 through 5 of the 3.x-1 LRA tables are taken directly from the associated tables in the SRP and GALL report. Column 6 tells the staff reviewer whether or not the FCS AMP is consistent with GALL and provides information on the material and environment associated with the component group. This column also provides additional information if the aging management differs from what is assumed in GALL, and provides information on any additional evaluations that GALL recommends.

The 3.x-2 LRA tables contain structures and components that were not evaluated in GALL. Because these structures and components were not evaluated in GALL, the staff had to perform a full review, just like those done for past applications.

The 3.x-2 LRA tables also have 6 columns, but the columns are different from those in the 3.x-1 LRA tables. The 3.x-2 LRA tables look very much like the Section 3 tables in previous applications. The first column identifies the system group, table number, and row number in the table. For example, 3.3.2.1 identifies LRA Table 3.3-2, row 1. Column 2 of LRA table 3.x-2 identifies the type of structure or component being evaluated. Column 3 identifies the structure or component material, while Column 4 identifies the environment that the structure or component is exposed to. Column 5 identifies the applicable aging effect, and Column 6 identifies the AMP that's credited for managing the aging effect.

Because these components were not evaluated in GALL, the staff determined the adequacy of the aging management evaluation and programs in the same manner as for previous applications.

The 3.x-3 LRA tables contain structures and components that were not evaluated in GALL, but the applicant has determined that the materials, environments, and aging effects are bounded by the GALL evaluation and that the GALL AMPs can be applied to these structures and components.

The 3.x-3 LRA tables have 8 columns. Columns 1 and 2 are the same as in the other tables. Column 3 identifies the structure or component material. Column 4 identifies the environment to which the structure or component is exposed. Column 5 identifies the applicable aging effect. Column 6 identifies the FCS AMP. Column 7 identifies the applicable GALL AMR evaluation that the applicant credits for managing the aging, and Column 8 provides a justification for applying the GALL AMR evaluation to the structure or component.

For structures and components in the 3.x-3 LRA tables, the staff performed a traditional evaluation of the aging management results and determined whether the GALL evaluation is applicable to the structure or component.

3.0.2 The Staff's Review Process for GALL

The staff's review of FCS LRA was performed in three phases. In Phase 1, the staff reviewed the applicant's AMP descriptions to compare those AMPs for which the applicant claimed consistency with those reviewed and approved in the GALL report. For those AMPs for which the applicant claimed consistency with the GALL AMPs, and for which GALL recommended no further evaluation, the staff conducted an inspection to confirm that the applicant's AMPs were

consistent with the GALL AMPs. Furthermore, in the case of FCS, the staff performed an additional review to determine whether the applicant properly applied the GALL program to its facility. For those AMPs for which the applicant claimed consistency with the GALL AMPs, and for which GALL recommended further evaluation, the staff performed a confirmatory inspection and reviewed the applicant's evaluation to determine whether it addressed the additional issues recommended in the GALL report. In addition, in the case of FCS, the staff performed an additional review to determine whether the applicant properly applied the GALL program to its facility. The staff also reviewed the applicant's evaluation to determine whether the applicable aging effect(s) would be adequately managed during the period of extended operation. For AMPs that were not consistent with GALL, or were not addressed in GALL, the staff's review determined whether the AMPs were adequate to manage the aging effects for which they were credited.

Several FCS AMPs were described by the applicant as being consistent with GALL, but with some deviation from GALL. These deviations are of three types: (1) exceptions to GALL - [*provide definition here*], (2) clarifications to GALL - [*provide definition here*], or (3) enhancements to GALL - [*provide definition here*]. For each AMP that had one or more of these deviations, the staff reviewed each deviation to determine (1) whether the deviation is acceptable and (2) whether the AMP, as modified, would adequately manage the aging effect(s) for which it is credited.

For those AMPs that are not evaluated GALL, the staff evaluated the AMP against the 10 program elements (Branch Technical Position RLSB-1 in Section A-1 of SRP-LR Appendix A).

The staff also reviewed the FSAR supplement for each AMP to determine whether it provided an adequate description of the program or activity, as required by 10 CFR 54.21(d).

The AMRs and associated AMPs in the GALL report fall into two broad categories: those AMRs and associated AMPs that GALL concludes are adequate to manage aging of the components referenced in GALL, and those AMRs and associated AMPs for which GALL concludes that aging management is adequate, but further evaluation must be done for certain aspects of the aging management process. In Phase 2, the staff compared the applicant's AMR results and associated AMPs to the AMR results and associated AMPs in GALL, to determine whether the applicant's AMRs and associated AMPs were consistent with those reviewed and approved in the GALL report. For those AMR results and associated AMPs for which the applicant claimed to be consistent with GALL, and for which GALL did not recommend further evaluation, the staff conducted an inspection to confirm that the applicant's AMRs and associated AMPs were consistent with the GALL AMRs and associated AMPs. For those AMRs and associated AMPs for which GALL recommended further evaluation, in addition to its confirmatory inspection, the staff reviewed the applicant's evaluation to determine whether it addressed the additional issues recommended in the GALL report. Finally, for AMRs and associated AMPs that were not consistent with GALL, the staff's review determined whether the AMRs and associated AMPs were adequate to manage the aging effects for which they were credited.

Once it had determined that the applicant's AMRs and associated AMPs were adequate to manage aging, the staff performed Phase 3 of its review by reviewing plant-specific structures and components to determine whether the applicant has demonstrated that the effects of aging

will be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the period of extended operation, as required by 10 CFR 54.21(a)(3).

3.0.3 Aging Management Programs

Table 3.0.3-1 presents the common aging management programs, the associated GALL program, the system groups that credit the program for management of component aging, and the SER section that contains the staff's review of the program.

Table 3.0.3-1

Common Aging Management Programs

Applicant's AMP (LRA section)	Associated GALL AMP	LRA System Groups that Credit the AMP for Aging Management	Staff Evaluation (SER Section)
Bolting Integrity (B.1.1)	XI.M3, XI.M18	3.1 - RCS 3.2 - ESF 3.3 - Auxiliary 3.4 - Steam and Power Conversion	3.0.3.1
Chemistry (B.1.2)	XI.M2, XI.M21	3.1 - RCS 3.2 - ESF 3.3 - Auxiliary 3.4 - Steam and Power Conversion 3.5 - Structures	3.0.3.2
Containment ISI (B.1.3)	X.S1, XI.S1, XI.S2	3.5 - Structures 4.5 - Concrete and Containment Tendon Pre-Stress TLAA	3.0.3.3
Flow-Accelerated Corrosion (B.1.5)	XI.M17	3.1 - RCS 3.4 - Steam and Power Conversion	3.0.3.4
Inservice Inspection (B.1.6)	XI.M1, XI.S3	3.1 - RCS 3.5 - Structures	3.0.3.5

Boric Acid Corrosion Prevention (B.2.1)	XI.M10,	3.1 - RCS 3.2 - ESF 3.3 - Auxiliary 3.4 - Steam and Power Conversion 3.5 - Structures 3.6 - Electrical	3.0.3.6
Cooling Water Corrosion (B.2.2)	XI.M20, XI.M21	3.2 - ESF 3.3 - Auxiliary 3.4 - Steam and Power Conversion	3.0.3.7
Fatigue Monitoring (B.2.4)	X.M1	3.1 - RCS 4.3 - Metal Fatigue TLAA	3.0.3.8
Fire Protection (B.2.5)	XI.M26, XI.M27	3.3 - Auxiliary 3.5 - Structures	3.0.3.9
Periodic Surveillance and Preventive Maintenance (B.2.7)	Plant-Specific	3.2 - ESF 3.3 - Auxiliary 3.4 - Steam and Power Conversion 3.5 - Structures	3.0.3.10
Structures Monitoring (B.2.10)	XI.S6, XI.S7	3.3 - Auxiliary 3.5 - Structures	3.0.3.11
General Corrosion of External Surfaces (B.3.3)	Plant-Specific	3.2 - ESF 3.3 - Auxiliary 3.4 - Steam and Power Conversion 3.5 - Structures	3.0.3.12
One-Time Inspection (B.3.5)	XI.M32	3.1 - RCS 3.2 - ESF 3.3 - Auxiliary 3.4 - Steam and Power Conversion	3.0.3.13
Selective Leaching (B.3.6)	XI.M33	3.2 - ESF 3.3 - Auxiliary 3.4 - Steam and Power Conversion 3.5 - Structures	3.0.3.14

Table 3.0.3-2 presents the system-specific aging management programs, the associated GALL program, the system groups that credit the program for management of component aging, and the SER section that contains the staff's review of the program.

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Table 3.0.3-2

System-Specific Management Programs

Applicant's AMP (LRA section)	Associated GALL AMP	LRA System Groups that Credit the AMP for Aging Management	Staff Evaluation (SER Section)
Containment Leak Rate (B.1.4)	XI.S1, XI.S4	3.5 - Structures	3.5.2.3.1
Reactor Vessel Integrity (B.1.7)	XI.M31	3.1 - RCS	3.1.2.3.1
Diesel Fuel Monitoring and Storage (B.2.3)	XI.M30	3.3 - Auxiliary	3.3.2.3.1
Overhead Load Handling Systems Inspection (B.2.6)	XI.M23	3.3 - Auxiliary	3.3.2.3.2
Reactor Vessel Internals Inspection (B.2.8)	XI.M13, XI.M16	3.1 - RCS	3.1.2.3.2
Steam Generator (B.2.9)	XI.M19	3.1 - RCS	3.1.2.3.3
Alloy 600 (B.3.1)	XI.M11	3.1 - RCS	3.1.2.3.4
Buried Surfaces External Corrosion (B.3.2)	XI.M34	3.3 - Auxiliary	3.3.2.3.3

Table 3.0.3-2 (Con't)

System-Specific Management Programs

Applicant's AMP (LRA section)	Associated GALL AMP	LRA System Groups that Credit the AMP for Aging Management	Staff Evaluation (SER Section)
Non-EQ Cable AMP (B.3.4)	XI.E1, XI.E2, XI.E3	3.6 - Electrical	3.6.2.3.1
Thermal Aging Embrittlement of Cast Austenitic Stainless Steel (B.3.7)	XI.M12	3.1 - RCS	3.1.2.3.5

3.0.3.1 Bolting Integrity Program

3.0.3.1.1 Summary of Technical Information in the Application

The applicant's bolting integrity program is discussed in LRA Section B.1.1, "Bolting Integrity Program." The applicant states that the program is consistent with GALL programs XI.M3, "Reactor Head Closure Studs" and XI.M18, "Bolting Integrity," with the exception that the applicant has not identified stress corrosion cracking (SCC) as an aging effect requiring management for high-strength carbon steel bolting in plant indoor air. The applicant also states that it will utilize ASME Section XI, Subsection IWF visual VT-3 inspection requirements rather than volumetric inspections for the inspection of supports.

This AMP is credited with managing aging in bolts in the RCS, ESF, auxiliary, and steam and power conversion systems, as well as in structural bolts.

The applicant performed inspections of bolted components under the FCS ISI program, the boric acid corrosion (BAC) prevention program, and the structures inspection program. Visual inspections conducted under the BAC prevention program included the inspection of bolted components in borated systems. Any indication of boric acid residue or damage is reported and evaluated to determine if a component can remain in service per established procedures. Documentation of operating experience is included as part of the BAC prevention program. On occasion, visual observations have identified BAC damage. These deficiencies were documented in accordance with the FCS corrective action program and resulted in repair or replacement, if required. Review of the plant-specific operating experience indicates that the inspections have been effective in managing the aging effects of bolted components.

On the basis of the above discussion, the applicant concluded that the bolting integrity program provides reasonable assurance that bolting aging effects will be adequately managed.

the matters described in the GALL report, except to ensure that the material presented in the LRA was applicable, and to verify that the applicant had identified the appropriate programs as described and evaluated in the GALL report. The staff evaluated those aging management issues recommended for further evaluation in the GALL report. The staff also reviewed aging management information submitted by the applicant that was different from that in the GALL report or was not addressed in the GALL report. Finally, the staff reviewed the USAR supplement to ensure that it provided an adequate description of the programs credited with managing aging for the reactor system components.

In LRA Section 3.1, the applicant provided brief descriptions of the reactor systems and summarized the results of its AMR of the reactor systems at FCS.

Table 3.1-1 below provides a summary of the staff's evaluation of components, aging effects/mechanisms, and AMPs listed in LRA Section 3.1 that are addressed in the GALL report.

Table 3.1-1

Staff Evaluation Table for FCS Reactor System Components in the GALL Report

Component Group	Aging Effect/Mechanism	AMP in GALL Report	AMP in LRA	Staff Evaluation
Reactor coolant pressure boundary components	Cumulative fatigue damage	TLAA, evaluated in accordance with 10 CFR 54.21(c)		Consistent with GALL. GALL recommends further evaluation (See Section XXXX below)
Steam generator shell assembly	Loss of material due to pitting and crevice corrosion	Inservice inspection; water chemistry		Consistent with GALL. GALL recommends further evaluation (See Section XXXX below)
Isolation condenser	Loss of material due to general, pitting and crevice corrosion	Inservice inspection; water chemistry		BWR
Pressure vessel ferritic materials that have a neutron fluence greater than 10^{17} n/cm^2 (E>1 MeV)	Loss of fracture toughness due to neutron irradiation embrittlement	TLAA, evaluated in accordance with Appendix G of 10 CFR 50 and RG 1.99		Consistent with GALL. GALL recommends further evaluation (See Section XXXX below)
Reactor vessel beltline shell and welds	Loss of fracture toughness due to neutron irradiation embrittlement	Reactor vessel surveillance		Consistent with GALL. GALL recommends further evaluation (See Section XXXX below)
Westinghouse and B&W baffle/former bolts	Loss of fracture toughness due to neutron irradiation embrittlement and void swelling	Plant specific		N/A (FCS is a CE plant)

NEW DOCUMENTATION OF STAFF REVIEW RESULTS

Because of the increased importance of the AMR inspection results to the staff's findings, future SERs will include the reports from both the scoping and screening inspection as well as the AMR inspection as appendices

LESSONS LEARNED TO DATE

DIFFERENT DEFINITIONS OF WHAT "CONSISTENT WITH GALL" MEANS

- **RESOLVED THIS WITH NEI**
- **BEGINNING WITH NEXT LRA SUBMITTAL, DEFINITION WILL BE CONSISTENT**

LRA CAN BE REFORMATTED TO PROVIDE THE GALL INFORMATION MORE EFFICIENTLY

- **RESOLVED THIS WITH NEI**
- **BEGINNING WITH NEXT LRA SUBMITTAL, LRA WILL HAVE REVISED FORMAT**

LESSONS LEARNED TO DATE

SER TEMPLATE SHOULD BE TRIMMED DOWN

STAFF IS REVIEWING ALTERNATIVE SER FORMATS

SUMMARY

FT. CALHOUN IS FIRST LICENSE RENEWAL APPLICATION UTILIZING THE NEW GALL PROCESS (ACRS PRESENTATION ON FT. CALHOUN SCHEDULED FOR EARLY JUNE)

6 GALL PLANTS CURRENTLY BEING REVIEWED

STAFF HAS DEVELOPED REVIEW AND DOCUMENTATION PROCESS TO AID IN THE REVIEW AND TO AID STAKEHOLDERS

STAFF WILL REVISIT GALL DOCUMENTS, AS WELL AS LRA AND SER FORMATS, BASED ON LESSONS LEARNED FROM THE FT. CALHOUN REVIEW