UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
***
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
***
MEETING: PLANT LICENSE RENEWAL

U.S. Nuclear Regulatory Commission
11545 Rockville Pike
Room T-2B3
Rockville, Maryland

Wednesday, April 28, 1999

The subcommittee met, pursuant to notice, at 1:01 p.m.

MEMBERS PRESENT:
MARIO H. FONTANA, Chairman, ACRS
MARIO V. BONACA, Member, ACRS
THOMAS KRESS, Member, ACRS
DON W. MILLER, Member, ACRS
ROBERT L. SEALE, Member, ACRS
WILLIAM J. SHACK, Member, ACRS
ROBERT E. UHRIG, Member, ACRS.

P R O C E E D I N G S
[1:01 p.m.]

DR. FONTANA: The meeting will now come to order.

This is a meeting of the ACRS Subcommittee on Plant License Renewal. I am Mario Fontana, Chairman of the Subcommittee on Plant License Renewal.

The ACRS members in attendance are Mario Bonaca, Thomas Kress, Don Miller, Robert Seale, William Shack, and Robert Uhrig.

The purpose of this meeting is for the subcommittee to review the NRC Staff's Safety Evaluation Report concerning Calvert Cliffs plant license renewal application and related matters. The subcommittee will gather information, analyze relevant issues and facts and formulate proposed positions and actions as appropriate for deliberation by the full committee.

Noel Dudley is the Cognizant ACRS Staff Engineer for this meeting.

The rules for participation in today's meeting have been announced as a part of the notice of this meeting previously published in the Federal Register on April 5, 1999.

A transcript of the meeting is being kept, and will be made available as stated in the Federal Register Notice.

It is requested that the speakers first identify themselves and speak with sufficient clarity and volume so that they can be readily heard.

We have received no written comments or requests for time to make oral statements from members of the public.

We will proceed through the meeting and we will call upon Mr. Christopher Grimes, Chief of the License Renewal and Standardization Branch to begin. Chris?

MR. GRIMES: Thank you, Dr. Fontana. I have the same difficulty with my title that you do. I stumble through it.

I appreciate the subcommittee taking time, especially at this juncture in the review. As all of you know, this is the first license renewal review being conducted by the NRC Staff under 10 CFR, Part 54 for a license renewal application. In close cooperation with the ACRS we decided to arrange for meetings to begin after the initial issuance of the safety evaluation and we are going to describe the Staff's review as it was conducted, using the draft Standard Review Plan for license renewal, but I want to emphasize since the receipt of the license renewal application for Calvert Cliffs in April of 1998 we have learned quite a bit in terms of how to work out the implementation details and we have arranged during the next day and a half to have BG&E describe some of their programs and now they approached the license renewal application, and then we have arranged for various representatives from the NRC Staff to describe the contents of the safety evaluation and the conduct of the review including the status of open and confirmatory items that were identified as we developed this initial safety evaluation.

At this point we are in the process of reviewing those open items and confirmatory items with Baltimore Gas & Electric in order to define appropriate success paths to complete a final safety evaluation, which currently is scheduled for November of this year.

With that, I would like to introduce Dave Matthews, who is the Director of the Division of Regulatory Improvement Programs and is my direct supervisor.

MR. MATTHEWS: I don't really have anything substantive to add other than if Chris didn't say I'll say it, that we appreciate the ACRS subcommittee's willingness to begin early review of this significant Staff effort and applicant effort in the hopes that we can work through the Staff work products as they are produced. Our expectation is that there be hopefully interim review results reported out by the ACRS as we proceed through this process, so that hopefully we will be able to meet our desired outcomes both in terms of completeness and accuracy but also in terms of schedule, with schedule to be one of the facets of quality in this project, as I hope you have appreciated by observing the progress to date.

With that, I think the next introduction is to Mr. Solorio.

MR. GRIMES: Are there any general questions that you have before we begin the Staff's presentation?

[No response.]

MR. GRIMES: If not, then I will introduce David Solorio, who is the Project Manager for the license renewal application in the License Renewal and Standardization Branch in NRR.

MR. SOLORIO: Good afternoon. My name is Dave Solorio. I am the NRC Project Manager here for BG&E's license renewal application for Calvert Cliffs.

Today and tomorrow the Staff will be presenting the results

of the review of Baltimore Gas & Electric's license renewal application as documented in the Safety Evaluation Report. Today I plan on providing you some general information on the Staff's review and then Sam Lee, also from the License Renewal and Standardization Branch, will talk about some of the more generic priority one license renewal issues that were applicable to many sections of the Staff's safety evaluation and also provide you a road map as to where other priority one license renewal issues are dispositioned in the Safety Evaluation Report that is going to be discussed largely tomorrow.

I would also like to add that if you are worried about the size of the slides here, it is because I have today's and tomorrow's presentations so Sam and I are essentially the first 12 slides.

Page 2 just provides a quick outline of some of the points I would like to make today, so I am going to start off with Page 3, which I put up here.

First, I want to provide you all a little orientation regarding where we started and what were some of the important steps in the Staff's review and where we are now in the review timeline.

On April 10th BG&E submitted their LRA, their license renewal application, to the NRC. It is comprised of three volumes. The focus of the Staff's safety review is on the material in the first two volumes, and for that reason for the rest of my presentation I will focus on the Staff's efforts associated with Volumes 1 and 2.

Starting in February of '98 and up through September of '98, the Staff issued questions related to the BG&E license renewal application, and up through December of last year BG&E provided their responses. There was a lot of intense interaction between those periods, trying to clarify and reach a common understanding on the areas that we were not so clear.

Additionally, we held public meetings and site visits were conducted to address difficult questions or issues that remained following Staff questions and BG&E responses. These efforts were very intensive and involved significant resource expenditures by both the Staff and Baltimore Gas & Electric.

However, looking back, I believe these interactions were very effective and they were a quick way to reach closure on certain issues. Overall I considered they were pretty successful.

Additionally, I believe having Calvert Cliffs so close also helped out the process a lot.

Finally, the Staff issued a safety evaluation with open items and confirmatory items in March of this year. For your information there's 28 open items and 20 confirmatory items. It is our goal in the presentations tomorrow to kind of discuss in each SER section what are the relevant open items, what are the confirmatory items and the license renewal issues and when you have a chance, maybe later tonight, and you are looking through the package you will see that.

DR. UHRIG: How do you define a confirmatory item?

MR. SOLORIO: A confirmatory item is defined as something that really is more of an administrative nature. BG&E has agreed to do the actions Staff has requested and it's more a formality in terms of

BG&E's responding on the docket they have done it or that they plan to do it.

Before I get into some of the more specifics of the Staff's review and the SER, I wanted to provide some orientation regarding how the license renewal rule provided some important principles that really helped to narrow the focus of the Staff's review.

The first principle here in the first bullet and the point I wanted to make was the part that really narrows the Staff's review focuses on the part that starts out with "the possible exception of the detrimental effects of aging."

This is what directs the Staff to focus its review on the management of aging effects on passive long-lived components.

The second principle is pretty clear and it is also intended to assure adequate safety during the period of extended operation by maintenance of the current licensing basis and to clarify that a confirmation or a reverification of the current licensing basis is not necessary for license renewal.

For example, if the current licensing basis is that two diesels are needed during the first 40 years, that should be good enough for the renewal period.

DR. KRESS: Were these principles handed to you as policy by the Commissioners?

MR. SOLORIO: They were handed to us in the statements of consideration to the '95 rule and I believe they were also in the '91 rule -- statements of consideration, excuse me.

Our next slide summarizes the overall Staff goal in the review of the license renewal application, which is to determine if a conclusion can be made to satisfy Part 54.29 which requires the Staff to determine several things -- first, that the applicant has proposed adequate methods for managing aging to ensure functionality per 54.21(a)(1), and that the applicant has identified time-limited aging analyses and either proved they are valid for the period of extended operation, re-analyzed them to project them to the end of the period of the extended operation, or provided an adequate program to manage the effects of aging on the intended functions for the period of extended operation.

The other requirements of 54.29 are that the applicant has met the applicable requirements of sub-part (a) to Part 51, the National Environmental Policy Act, and that matters under 2.758 have been addressed. However, I want to reiterate that the specifics of the Staff's presentation to you today and tomorrow focuses on the first two items, the details of how the applicant meets sub-part (a) of Part 51 and how the matters related to Part 2.758 are addressed in other NRC processes outside the safety evaluation review.

The specifics by which the Staff performed its review to make the 54.29 determination are covered in Chapters 2, 3 and 4 of the SER.

In Chapter 2 the Staff evaluated the implementation of BG&E'S integrated plant assessment methodology to determine which components, systems and structures should be within the scope of license renewal.

The second part of this evaluation involved evaluating BG&E's determination of which passive, long-lived components, systems and structures should be subject to aging management.

DR. KRESS: I would like to return to your two principles again for just a second.

If we were to conceive of a concept that licensees would come in for license renewal again and again and again and again, would you consider this principle to still be a valid, the first one, to still be a valid principle under those circumstances?

MR. SOLORIO: The Atomic Energy Act I guess provides for that scenario you just went through but I think we would probably have to re-evaluate it the second time around and see if we could re-conclude that, but I think Chris Grimes has some comments.

MR. GRIMES: I would say that this process would work in terms of continuing to go beyond, based on the premise that if there is a need to address some safety weakness that we would do that in the context of making backfitting decisions for the current licensing basis, and the extension period focuses specifically on whether or not there are adequate aging management effects and so as a principle we believe that if a utility were to come back, you know, 20 years hence and say I want to apply for another extension that this principle would continue to be valid.

Mr. Doroshuk wants to make a comment.

MR. DOROSHUK: Yes, sir. Mr. Kress, my name is Barth Doroshuk. I am the Project Director of the Calvert Cliffs license renewal project, and I believe the history of these two principles of the renewal rule come from the regulatory analysis that was done on the original rule where the NRC reviewed several options on how to implement license renewal, ranging from do nothing to full SRP requirements, and this, given all the considerations that were taken into account in that regulatory analysis, was the preferred regulatory approach and fundamental assumptions.

DR. KRESS: Thank you for that.

DR. UHRIG: Where did the 20 year term come from? Is that inherent in the original licensing legislation or is this something that came out of the study?

MR. SOLORIO: It was not, it is my understanding it was not part of the initial licensing. It's my understanding it came out of the Staff's work in the first rule of '91.

MR. GRIMES: I'm sorry, would you repeat the question, please?

DR. UHRIG: Basically where did the term of 20 years become the standard by which you were working here? Is this -- there was some discussion early on, maybe seven or eight years ago about a 10-year renewal, I remember.

MR. GRIMES: All I can say is it was a conscious Commission decision that the period --

DR. UHRIG: It was a Commission decision?

MR. GRIMES: Yes. We have a volunteer to address this question from NEI.

MR. WALTERS. Doug Walters, NEI.

When we initially looked a license renewal we made some assumption about replacement facilities and we backed off of the 40 years and said, well, it is probably going to take you five years to prepare the application, maybe five years for review, and the feedback at the time was a licensee would need about 10 years to decide if the renewed license was not issued what would I do as an alternative, so that gives you the 20 years, and then that fit in nicely with the fact that the Atomic Energy Act will only allow a license to be valid for 40 years, so that is why the 20 years -- you can't submit before the 20 years.

MR. SOLORIO: In Chapter 3 the Staff evaluated Baltimore Gas & Electric's identification of aging effects and management of aging effects to ensure equipment-attended functions in accordance with the current licensing basis are maintained during the period of extended operation.

Finally, in Chapter 4 the Staff evaluated Baltimore Gas & Electric's methods to determine how analyses with time limited aging assumptions will be extended or managed or evolve for the period of extended operation.

My next slide provides some specifics of the Staff's review process. Because of preliminary work done by BG&E and the Staff several years ago, the Staff was able to narrow its review relating to scoping and screening to the implementation of BG&E scoping and screening methodology.

Because the Staff had already previously reviewed BG&E's integrated plant assessment methodology submitted in '95 and concluded the methodology was acceptable for meeting the requirements of 54.21(a)(2), which were to justify the methods used in 54.21(a)(1).

Specifically on April 4th, 1996, the Staff issued a final safety evaluation on BG&E integrated plant assessment methodology. In that SER the Staff also concluded that the methodology if implemented provided reasonable assurance that all structures and components subject to an AMR pursuant to 54.21(a)(1) would be identified.

As a result of this previous work, the Staff focused during the review of BG&E license renewal application on the implementation of its methodology and tomorrow Mr. Chris Gratton, from the Division of Safety Systems and Analysis will make a presentation on how the Staff tested and evaluated BG&E's implementation in its SER Chapter 2.

Also, it is my understanding that a copy of the draft safety evaluation was provided to the ACRS member at that time. A letter was issued on February 7th with no comments at that time.

I would also like to add that the license renewal inspection program also provides another assessment tool that the Staff uses to evaluate the implementation of BG&E's IPA methodology. The results from very recent scoping and screening inspection conducted by Region 1 with participation by the License Renewal and Standardization Branch staff, were that BG&E implemented its methodology effectively.

My final slide here lists the resources and guidance documents used by the Staff to conduct its review of the BG&E license renewal application. You heard Mr. Grimes earlier mention that the primary document used by the Staff is the draft Standard Review Plan for

license renewal, which incorporates Staff experience gained from the review of NUMARC industry reports addressing the management of aging of specific structures and components for license renewal.

The Staff also used the statements of consideration accompanying the 1995 rule because it included many examples of structures and components that require renewal review and how to do specific aspects of the renewal review.

Also, draft Reg Guide 1047, which proposed to endorse NEI 95-10, industry guideline for implementing the requirements of Part 54, was also used by the Staff.

Last year the Staff developed NRR Office Letter 805, license renewal application review process, which was also used as a guidance document.

A significant resource that really contributed to success has been the NRC and BG&E management meetings that were held monthly to talk about the status of the license renewal application and talk about issues that might be having a potential to slow things up, and also there are the management meetings between, periodically held between the NEI working group for license renewal and the NRC License Renewal Steering Committee to deal with the tougher issues.

Then there was also the license renewal issues, which some of the Staff will be talking to you all about tomorrow in terms of which SER sections they addressed. Sam Lee will talk a little bit after me about some of the more generic license renewal issues that were addressed in mini-sections by the Staff.

There is also the BG&E license renewal application template that was developed by BG&E and the Staff cooperatively working to put together a kind of a guide, a roadmap, for what a LRA should look like and what it should contain.

In the License Renewal Inspection Program, which I mentioned to you earlier, we have just completed two site inspections in that program.

The final two documents I wanted to mention were NUREG-1557, which was the summary of technical information agreements for NUMARC and Resources Council, industry reports addressing license renewal as well as NUREG 69.40, which is nuclear power plant generic aging lessons learned.

That is really what my presentation was going to cover -- try to give you a flavor for some of the tools that Staff used, how they went about it, what the status is.

DR. SHACK: Do you have any comments on some of these -- like the draft Standard Review Plan and the draft Reg Guide as far as is it satisfactory guidance? Do you see changes that need to be made? Did you get a lessons learned --

MR. SOLORIO: Well, under the NRR Office Letter 805, we have a lessons learned program that did require us to take whatever lessons we're learning BG&E and also the Oconee review and try to fill in where the Standard Review Plan may not have an appropriate level of guidance for the Staff right now.

I guess there are issues that have come up that we have had to not necessarily have a Standard Review Plan telling us what to do in

that case, and we have had to work on that, and part of our process is to factor that information back into the Standard Review Plan.

DR. SHACK: Has that process occurred, or you are in the middle of that?

MR. SOLORIO: Oh, I would say that process is occurring. We have some license renewal issues. We have some lessons learned that are starting to be written up by some of the License Renewal and Standardization Branch staff. If you are interested we could possibly come over and talk with you about some of those issues.

MR. GRIMES: We will cover quite a few of those when we address the generic renewal issues, because many of the generic renewal issues constituted comments on the draft Standard Review Plan and issues associated with the industry guide, NEI 95-10, and as we have gone through -- as we originally planned, we expected to learn lessons during these initial reviews and then feed them back into improvements in the Standard Review Plan, and we will be discussing those in the context of the generic renewal issues.

DR. UHRIG: What do you mean by template?

MR. SOLORIO: Elaborate?

DR. UHRIG: Yes -- a little more than --

MR. SOLORIO: Prior to -- was this in the '96-'97 timeframe -- Baltimore Gas & Electric and NRC decided that in order to help get the first license renewal application in the door it was a good idea to try to work on a way to provide a format for Baltimore Gas & Electric to structure an application so that the Staff could complete its review, so the Staff -- BG&E provided some sample, well, some completed documents for real systems and the Staff had some intensive 90-day efforts to come up with a six-page template as to what BG&E was going to provide for their license renewal application.

DR. UHRIG: Is this essentially the same template that is used for Oconee or is each plant going to have its own template?

MR. SOLORIO: Well, this was done for BG&E. Oconee I don't believe has a similar template for the safety side. They might have one, I believe, for the environmental, something similar was done for environmental.

DR. UHRIG: Is this to be a pattern for future license renewal applications?

MR. SOLORIO: I don't believe so. I think the way we will try to provide a pattern for future license renewal applications is through our safety evaluations, through the Standard Review Plan and through the draft Reg Guide 1047.

DR. UHRIG: Okay.

MR. SOLORIO: I think the idea was to get BG&E to be the first --

DR. UHRIG: So it is unique to them?

MR. SOLORIO: Unique to them.

MR. GRIMES: I would like to add that Calvert Cliffs and Oconee have very different applications.

Calvert Cliffs is organized more by system. Oconee is organized more by program. We shared those outlines along with the Staff's safety evaluation outline with NEI and we recently opened a

dialogue with NEI to see if we could work out a mutually acceptable standard form and content for license renewal applications that would provide appropriate flexibility for the utilities but also make it easier for the Staff to review it but that is consistent with our organization, so we expect to have a standard that is derived from the experience with these first two applications.

DR. UHRIG: What you are really aiming at is sort of a mini-Standard Review Plan?

MR. GRIMES: Yes -- I think it was NUREG 1270 standard form and content for license applications -- something like that.

DR. SHACK: One of the features that interested me was this age-related degradation inspection thing. Is that something that is in these guidance documents or is that a unique thing for Calvert Cliffs?

MR. SOLORIO: I am at a loss here.

DR. SHACK: Well, it is this so-called ARDI, which is used in the thing. I just wondered if that was their invention or did that come out of -- well, I think it is BG&E's invention. Maybe I should let BG&E speak to that. That is a unique feature.

MR. DOROSHUK: I can comment on that. My name is Barth Doroshuk from Calvert Cliffs again.

In the industry efforts, through NEI, and through the Electric Power Research Institute -- EPRI, and through the plant-specific efforts it was realized that there are many common components within systems across the plant and if you add them all up, they turn into a large population and the approach that was taken in the industry, and of course we developed our own plant-specific approach, was how would we develop a sampling inspection program so that we could go in and perform the necessary aging inspections on a representative sample of these large volumes of components.

We happened to develop the program at Calvert Cliffs and we developed the acronym ARDI, so it is a sampled inspection program that is used on various types of component types in the plant. It could be small bore piping. It could be component supports -- other types of components that are in large quantities.

MR. GRIMES: I would also like to add that we expect other renewal applicants to do that same thing. They may call it by a different term. Maybe we can standardize the term at some point in the future as well.

I will also take this opportunity to correct my reference. It wasn't NUREG 1270 -- it is Reg Guide 1.70 that is the standard form and content.

DR. FONTANA: Any additional questions?

[No response.]

DR. FONTANA: Are you ready to go to Sam Lee?

MR. LEE: My name is Sam Lee. I am from the License Renewal and Standardization Branch and I am going to talk to you about the license renewal issues.

Between the Staff and NEI we have compiled a list of license renewal issues which are generic implementation issues, and they mostly come from NEI's comments on the draft Standard Review Plan for license renewal.

We have worked with NEI and we have agreed on how to put priority on these issues.

Priority one issues are those that should be addressed to support the review of the license renewal applications, such as BG&E and Oconee and priority issues that are generic issues. That should be resolved so it can be incorporated into the rule implementation guidance documents such as the Standard Review Plan, the Reg Guide, or NEI 95-10.

Priority 3 issues are less significance.

We are in the process of addressing some of these issues and also working with NEI to get some of these issues clarified.

As the Staff identifies issues we also -- like the lessons learned, we identify a certain issue and put it into this process also so we can look at it.

The next two slides are the current Priority 1 issues.

The first one is the issue number -- for each one we identify a number and a description. In the slide we also have how we considered that in the BG&E review.

This is a roadmap to what you will hear tomorrow.

For example, the issue 98-0014 -- that is the EQ, and tomorrow you will hear about that regarding Section 2 of the SER so that is for most of this.

I will talk about this -- for the generic, they have got color codes, many sections of the SER.

The first item is 98-003. This talks about the -- and the industry question about the need for wide operating experience information in the application, to support the applicant's determination of the applicable aging effects and to demonstrate the adequacy of the aging management program.

In Baltimore Gas & Electric what we did is, I guess last year or the year before we developed with BG&E a template, which is the form and content of the application. In there BG&E agreed to provide that information to us to review, so that is how we addressed that. BG&E provided the information.

But the generic issues, they are outstanding in terms of what the industry should provide generically.

DR. SHACK: What exactly is meant here, Sam? Is this discussion, for example, on whether there's cracking of the reactor vessel internals and you look at industry experience with that problem? Is that the kind of --

MR. LEE: Yes, that's what the cards say. One thing is our industry experience and another thing is plant specific experience, so we actually do an evaluation of the vessel internals, okay? In your application you actually describe industry has seen certain cracking and my plant has seen certain cracking, therefore I have this cracking and I am managing this and the industry program "x" has been adequately managing this kind of cracking and found certain things and repair and replaced. At my plant we had a program "x" also and it has been effective.

They need to say all of that in the application for us.

MR. GRIMES: The concern that was originally raised was how far do you have to go? What if you have not had any experience?

DR. SHACK: What was the issue here?

MR. GRIMES: The way that we approached the resolution of this issue was we gave guidance to the Staff that said ask questions about operating experience if you can point to specific experience that is relevant that you think applies, but don't expect the applicant to come in and explain every possible experience that anyone possibly has. It was that open-ended feature that was the larger concern.

I think that ultimately we are going to end up resolving this by providing guidance to the Staff that says if certain operating experience that you know of has not been mentioned or pointed to or described in the application, then inquire about it, but don't ask questions like tell me about all the operating experience you have ever had.

The ultimate solution to this thing I think is going to end up being as we gather more and more evidence of what is the appropriate operating experience to refer to that we will sharpen up the expectation in terms of what the appropriate level of detail is.

DR. FONTANA: It is my understanding that Priority 1 issues are going to need to be resolved before the extended license is issued, is that correct?

MR. LEE: Right now they are scheduled to be -- actually all the issues will be scheduled to be resolved before the BG&E SE --

DR. FONTANA: Yes. That is one of the requirements that makes it a Priority 1 issue as compared to Priority 2 --

MR. LEE: They will be resolved.

DR. FONTANA: What?

MR. LEE: According to the schedule right now, yes, they will be resolved.

DR. FONTANA: The question relates to, for example, on operating experience the resolution then is an identification of how much is going to be required. Let me

MR. GRIMES: Let me clarify. We viewed these issues as issues that we would have to address during the first two license renewal applications, but the resolution basically is how did we treat it?

We treated operating experience in these first two reviews. Now that does not necessarily mean that as a result of developing this guidance to the Staff that we won't find a better way or more detailed guidance to put in the Standard Review Plan.

Similarly, environmental qualification and some of these other areas, we have dealt with them. We have addressed them but now there are spin-off issues and so I don't view the ultimate solution of all of these issues as a prerequisite to completing the licensing for these first two applications, but we did put them high on our list because we felt they were things that we would have to confront.

MR. LEE: But we learned from BG&E and Oconee also, so we can feed back into the generic process. I mean do we still want to do something like this.

DR. UHRIG: This implies that a Priority 2 or perhaps a Priority 3 category of issues, those will not be resolved before the renewal of the license?

MR. GRIMES: Most of the characterization that I would provide for those other issues are there are questions about the form and content of the application or particular questions that were raised about how do we deal with a particular aging effect, and so we put them down as a lower priority because they basically are things that are more beneficial for future applicants.

That doesn't mean that we are not working on them. We are making some progress on the lower priority issues, but we didn't see them as critical to completing the review for the first two applications.

DR. UHRIG: Okay, so this really --Priority 1 is the tentative classification for the first two applications?

MR. GRIMES: That is correct.

DR. FONTANA: I don't have the list in front of me, but when I looked at Priorities 2 and 3, there appear to be some, particularly in Priority 2, which seemed to be pretty important.

Is it just a case that these are the ones that relate to the first two?

MR. GRIMES: Yes, there are some of those that are very important but the first two applicants just addressed them in whatever fashion they felt they could address them.

In terms of the Staff providing more guidance, in the Standard Review Plan or putting more guidance in the NEI 95-10 in terms of the treatment of those issues in future applications was basically the issue that we're pursuing.

MR. LEE: Okay. The second issue in here is FSAR content. The license renewal rule requires an applicant to submit an FSAR supplement summarizing the aging management program and the timely aging analysis evaluation.

This is an open item in the BG&E SER. We are waiting for the final SE in terms of what we rely on for the safety conclusion and also we are -- the agency is providing improved guidance on updating the FSAR, which is 50.71(e) and we are consulting with those people and trying to be consistent with that -- so that's that.

The other ones you'll see tomorrow --

DR. SHACK: Sam, could I just ask you a question about fatigue.

MR. LEE: Okay.

DR. SHACK: That is an interesting one. I see you had a meeting yesterday that you discussed that one. Somehow the discussion here doesn't seem to reflect any of the concerns that are addressed here -- "here" is in the SER and the BG&E thing. It seems to have gone on as though all this had never been occurring.

MR. LEE: -- it's an open item in the BG&E SER.

DR. SHACK: And it just sort of is left that way as the open item with the GSI-190 and --

MR. LEE: Yes. Basically that is what is left open is the GSI-190. That is what it is, and, yes, we are working with BG&E to try to resolve that.

DR. UHRIG: Because I am surprised it says "Not Priority 1."

MR. LEE: Okay. What happened in this case is -- like I

said, it is not Priority 1. Initially we assigned priority to those issues and we did not think those are Priority 1.

The issue really is -- well, there are several parts to the issue. One part is the GSI-190. Another part is the use of the non-mandatory Appendix L in Section 11 for inspection for fatigue, okay? -- and this issue is weighted more towards Appendix L, which BG&E and Oconee that's not proposed to use in their applications, so we don't see that affecting BG&E or Oconee. At the time we put priority on these issues, GSI-190 was close to being resolved.

It is only recently when the schedule gets pushed out, okay, so now it affects BG&E and Oconee.

DR. SHACK: You mean the guy that volunteers to use the Appendix gets grilled on it? The guy that ducks it doesn't have to answer questions?

MR. LEE: They are not proposing Appendix L for the program -- for the plant for license renewal. NEI wants to use Appendix L, okay, for the industry, okay, so they don't propose it and that's not what the program really evaluates for BG&E and Oconee.

MR. GRIMES: I would also like to point out that you see the difficulty that we have in trying to maintain stability in the process, because we started off pursuing one question and we thought that -- you know, we had certain expectations about how the review would proceed on some of these issues, and because we don't -- we can hardly keep track of how many open items are we tracking and what is their status. We move them around but we don't change their designation so much as we just recognize we now have a couple of issues that have evolved as we continue with the review.

Now we have to make some decisions about whether or not we bifurcate the issue or create a new one.

I think -- Sam, are we up to 109?

MR. LEE: Yes.

MR. GRIMES: We are up to 109 issues now as we continue our learning process, and fatigue as we are approaching it now is not the same question about how are we going to treat fatigue that we originally started with.

We thought it would be fairly simple to separate GSI-190 from an assessment of managing fatigue, but it is not as easy as we had hoped and so we are proceeding to try and find a resolution of that that will permit us to reach a conclusion for a complete safety evaluation.

DR. FONTANA: You said these are going to be discussed in more depth tomorrow?

MR. LEE: That is correct, yes, and this is the roadmap, so say, for example, when you come to this issue tomorrow, when we come to this Section 2 of the SER presentation, they will actually discuss that. This actually will be in their slides on the license renewal issues and you have that and then they will discuss that.

We figure you will get more detail when you get individual sections.

I will just talk about, there is another one in here, there is 98-0100. This is not a BG&E issue; this is Oconee's -- and here is more interesting one.

DR. SHACK: It is truly a plant-specific issue.

MR. LEE: Well, these are effects of Oconee, one of the first applicants.

There is an issue under heat exchanger function and this is part of the learning process. We did not have that upfront but now we learned and then we added this to the database.

For BG&E they managed the aging of the heat exchangers for the pressure boundary function and it's now written in the SER and that is acceptable.

However, when Region I goes out to do the license renewal inspection they had a question about should they also include the heat exchange function as a function of heat exchanger to be managed, so this is a question and the Staff now is in action to evaluate this, to see if any additional aging management is needed for the heat exchange function, the heat exchanger.

This last slide shows the lessons learned.

That is all the Priority 1 issues I have, so do you have any questions on that? You will hear more on this in detail tomorrow, by individual sections.

DR. FONTANA: I know that we have several questions on them, so we will address them tomorrow.

MR. LEE: That's correct. You can ask the presenter tomorrow.

DR. MILLER: The level of detail we will hear will be in some cases more than what is in the SER?

MR. LEE: You will have the reviewers in here, so you can ask them and they will tell you, you know -- if you have a question, you can ask them.

MR. GRIMES: But I will bring Sam back, because he is responsible for helping to answer the questions too.

DR. SHACK: Sam -- I thought when I heard license renewal inspection program that was really a process inspection for how they implemented things. It says here that they are going into more -- what is the scope of this actual license renewal inspection program?

Are we going to hear more about that tomorrow?

MR. GRIMES: We hadn't planned on it. We can --

DR. SHACK: I mean is it basically looking at their processes or you are actually out looking at -- is it plant walkdowns? What is it?

MR. GRIMES: Yes, both.

DR. SHACK: Both.

MR. GRIMES: We look at the process and then we look at the results of the process to see how it worked. We verify the contents of the application and we verify particular details that the Staff relied on for its safety evaluation conclusion.

DR. SHACK: So it really inspects the entire scope, of which you need to do this baby?

MR. GRIMES: That's correct. We want the inspection to verify the process and the process controls, the results of the process in terms of scoping and screening, applicable aging effects, the aging management programs are as described in the application, and then

time-limited aging analysis -- all of those areas are sampled by the inspection so that when the review is complete the Regional Administrator will be able to contribute to a license decision with a full complement of information.

DR. FONTANA: Do these inspections feed into trending analyses, of trends and extrapolations?

MR. GRIMES: The NRC inspections of the license renewal?

DR. FONTANA: Inspections that you are talking about here. I mean do they feed into a central trending program of some kind?

MR. GRIMES: I am hesitating to answer that question because the NRC inspections of the licensees -- or the applicants for license renewal activities really get to a specific licensing action and that is separate from the inspection program evolution from SALP into this new oversight process.

It is theoretically conceivable that we might see something in the license renewal inspections that will be shared and used in the oversight process but in terms of trending plant performance, I see that as unlikely.

DR. FONTANA: I guess I was more concerned with the other direction, information that came from inspections beyond licensing -- feeding into license renewal decisions?

In other words, say you identify -- say you are inspecting an existing plant, and this is all hypothetical of course, and you identify -- by trend you identify an aging effect, and you do an extrapolation and say, oh, that is going to go to year 42 or something like that.

The question is, how does this feed into what you are trying to do?

MR. GRIMES: I will answer that in two ways. The first way is our normal process for analyzing events and information that leads to generic communications is now sensitized to looking for aging effects, and so throughout our normal routine we expect to find feedback, but then I also mentioned earlier that as part of the Staff's review, if we have knowledge of or learn about particular plant experience that is relevant to the effectiveness of an aging management program, then we pursue that.

Most of it is going to be volunteered in the application. In the case of Baltimore Gas & Electric there was some experience during the conduct of the review that we reflected on to see whether or not it affected aging management. I believe that was a line break in the secondary system that caused us to reflect on the fatigue issue so we look at the processes to deal with those things in terms of implications and trends. Does that answer your question?

DR. FONTANA: The question relates to a question you are going to be hearing probably over and over again over the years -- is the -- trying to get away from compartmentalization, this effort with other efforts, and I am sure you are aware of that. It will be raised.

MR. GRIMES: We are acutely aware of how we need to improve our overall regulatory processes and so license renewal is in the spotlight right now because license renewal is a very important aspect of regulatory improvements, but we are also looking at more effective

work processes and sharing information across the agency, so we are tuned into that as well.

DR. FONTANA: I thought you were.

Any additional questions?

[No response.]

DR. FONTANA: We were scheduled for a break at 2 o'clock. I guess we might as well take it and come back with Barth Doroshuk.

MR. DOROSHUK: Yes, sir.

DR. FONTANA: How about 2:15, okay?

[Recess.]

DR. FONTANA: The meeting will come back to order. Are you ready?

MR. DOROSHUK: Yes, sir. I'll put the microphone on.

DR. FONTANA: Sure. At this point we will hear the presentation by Barth Doroshuk, Baltimore Gas & Electric.

MR. DOROSHUK: Good afternoon, Mr. Chairman and members of the ACRS Subcommittee on Plant License Renewal. My name is Barth Doroshuk and I am the Project Director for the Life Cycle Management License Renewal Project at Calvert Cliffs, and we appreciate, on behalf of Baltimore Gas & Electric we appreciate the opportunity to provide you with our remarks this afternoon.

I'll take a moment to just introduce a few people that we have brought with us -- Mr. Dick Heibel, at this table, is the Manager of Nuclear Projects and he is my immediate supervisor at Calvert Cliffs -- he is also responsible for our steam generator replacement project and all the other projects that are performed on the plant; John Rycina, to his left, is the Project Manager of the Integrated Plant Assessment, which we will be covering today, and I guess the Staff will be covering tomorrow; to Dick's right is Mr. Marv Bowman -- he is the Project Manager for the implementation side of the License Renewal Project -- he interfaces with the plant; Don Shaw, who is assisting me here, is the Project Manager of the application and review and is the primary interface with Dave Solorio, our Project Manager at NRC.

I would like to also at least acknowledge Dr. John Carey from the Electrical Power Research Institute, EPRI. BG&E and EPRI have had a longstanding technical exchange since the mid-'80s on life extension and their work and our contributions to their efforts as well has been a great help here.

Tomorrow we will have a number of other engineers, project engineers, here. We feel we can field the questions today, but we will certainly have a large depth tomorrow as we go into the detailed technical review, and so if we can't answer your questions today or tomorrow then we'll have to take -- but we think we will be well prepared for your review today and tomorrow. Next slide, please.

The purpose of my presentation is to provide you with an overview of the development, the review and the implementation of the Calvert Cliffs license renewal application. I am going to try to achieve that by doing four things. I am going to discuss the Calvert Cliffs Nuclear Plant and its role with Baltimore Gas & Electric in the state of Maryland, the importance it plays. I am going to discuss the license renewal application itself, the development, the content, how it

came about, and then focus on the findings, which are the programs that we are committing to manage aging and how we are implementing those findings at the plant within the engineering staff and the maintenance organizations.

I would encourage you to interrupt me and ask questions along the way. As I said, we will do the best we can to field those. Next slide, please.

Calvert Cliffs is a twin-unit Combustion Engineering NSSS station. Bechtel is the AE of record. It is a pressurized water reactor. The operating licenses were issued in 1976 and 1974 and they expire in 2014 and 2016. They are full 40-year licenses. Calvert Cliffs was the first plant to obtain construction period recapture in 1985, which was the shifting of the OL date from the CP point to the OL issuance date.

The plant is located about 60 miles southwest of Washington, D.C. on the Chesapeake Bay, as shown here. It sits on a 2300 acre site of land, of which 180 acres is used approximately for the plant itself. The rest of the site is farmland. It is a wildlife refuge and it has marshlands, is the home of 90 percent of the world's population of the tiger beetle and we also have a Bald Eagle's nest on the site as well and we host a number of other animals as well, as you might imagine.

DR. FONTANA: Is that a working farm right next to you there?

MR. DOROSHUK: Yes, sir, it is.

The number one goal for Calvert Cliffs is nuclear safety. That is the goal for the plant, and if we cannot achieve our number one goal, then the plant does not operate, period. It is an easy standard to understand and we meet it on a continuous basis.

The plant must also remain competitive, and as we approach deregulation we are making efforts to make sure the plant is ready from a safety, a reliability, and a cost competitive perspective.

We have had an excellent track record over the last 25 years. I would note that in the late 1980s and the early 1990s we were on the Troubled Plant List. We recognized the areas of improvement. We made those improvements and since then our record -- the record of the plant speaks for itself. We continue to hit in the top quartile for most indicators.

The goals are set up to guide us into the future. We need to continue to be an asset to the customers of Baltimore Gas & Electric and we need to continue to be an asset for the residents of Maryland, the stakeholders, and after achieving all these goals we need to continue to retain the ability to invest wisely in the plant. You can't have a plant that is meeting all of these differing goals and not be able to continue to make improvements and the last goal is equally important.

We need to continue to evolve. The plant is a learning plant -- next slide.

The nuclear decision, the decision to operate a facility -- this is our philosophy -- or permanently close it must be based on several inputs -- sound technical information, safe, reliable production record, and projections into the future, a knowledge of where you stand

competitively in the evolving marketplace, the ability to continue to operate the plant and meet those goals must be forged with a vision of integrity, quality and safety.

DR. KRESS: These are --

MR. DOROSHUK: Inputs into our decision --

DR. KRESS: That is your decision. These would not be inputs into NRC's decision?

MR. DOROSHUK: No. That's correct. I am a little bit in a broader topic at this point. I will focus in.

Our decision to relicense Calvert Cliffs and to continue to operate the plant is based on sound technical information, a safe and reliable production record, and projections and a knowledge of where we will stand in the competitive marketplace. Our vision is based on integrity, quality and safety. Next slide.

Calvert Cliffs is important to Baltimore Gas & Electric, to Maryland and to all the region. It makes up about 30 percent our energy supply. It provides on an annual basis 50 percent of our generation from BG&E, and I guess you can look at it as the backbone of the energy supply to the state of Maryland. Next slide.

The decisions that are being made these days on nuclear facilities are complex. I can tell you that since 1989, when the life cycle management organization was established at Calvert Cliffs that we have evaluated all aspects of the continued operations of the plant and we concluded that from all aspects that it just makes sense to continue to operate Calvert Cliffs and to continue to preserve the license renewal option in the state of Maryland, and that is what license renewal is -- it is an option to operate the plant.

Today we will focus primarily on the technical aspect of these evaluations. Next slide.

DR. SHACK: How recently did you come to the decision to replace steam generators?

MR. DOROSHUK: We have been evaluating steam generators intensively since probably 1990 on a continuous basis, knowing that the rest of the industry has been replacing steam generators. We didn't experience a significant number of tube plugs until 1995, which was 20 years into, basically into the operation, so I think that speaks well of the programs we have had to maintain the steam generators on site.

We actually made the decision in 1998 to go ahead with the steam generator replacement so we looked at the data for about two and a half -- two consecutive outages to confirm that we were not just seeing an inspection transient.

DR. SHACK: That is for both units?

MR. DOROSHUK: For both units. The schedule for replacement of steam generators is 2002 and 2003. Unit 1 will have its steam generators replaced in 2002 and Unit 2 will be in 2003. It is a like-for-like exchange where we will have, basically we will replace the inner bundles inside containment and refurbish the dome inside containment and perform the welds back together. It will not be a complete changeout. We are going to preserve the domes, refurbish inside, but basically manufacture the internals.

We believe that early investigations on nuclear facilities,

both technical and financial, combined with a commitment of excellent performance are necessary to avoid a bow wave of technical and financial risks that could be so insurmountable that continued operation is jeopardized.

These types of bow waves challenge our decision-making process.

We have taken an approach at Calvert Cliffs that has been referred to as a life cycle management approach to managing its nuclear assets. It is the long view. We feel that these early investigations have allowed us to make responsible decisions regarding the future of Calvert Cliffs. Without these strategic actions we are not sure that discrete strategic decisions can be made appropriately. Next slide.

Turning more to the subject at hand regarding plant aging, again from a life cycle management perspective there are some undesirable knowns that aging provides us in that plant aging can result in unanticipated increased costs, both O&M and capital, increased plant unavailability, and regulatory-driven recovery programs.

Plant age-related failures ignore our planning horizon. They don't care when our outages are.

We also realize that across the world that it is difficult to apply the right resources at the right time on the long view to anticipate every single challenge we are going to have and avoid them. These unanticipated events bolster our competition's perception of us as a weak and unlikely contender and weak in our resolve to make knowledge-based decisions.

In our view of life cycle management, this is what we are trying to avoid technically.

The elements of our program that we believe make up our success is a good understanding of the plant historical behavior. Calvert Cliffs Life Cycle Management Organization has been staffed with approximately 20 to 25 full-time engineers since 1989 who are located at the plant inside the Engineering Organization of the plant, working with the plant people. We feel that this infrastructure, this change, this organization has build a decent plant historical record and understands its behavior. The resources I mentioned are being applied appropriately.

Mitigation measures are appropriate for success. Discovery techniques, which is the confirmation of what we are studying -- we are not doing an engineering analysis for the sake of an analysis. Our philosophy is if you come to a conclusion you basically should go check it. If you find yourself in analysis space, it's probably better off that you go walk down the plant or perform the right inspection to determine what real world activities are occurring.

DR. FONTANA: What is an example of mitigation measures?

MR. DOROSHUK: Chemistry.

DR. FONTANA: Okay.

MR. DOROSHUK: Cathodic protection.

DR. FONTANA: Thank you.

MR. DOROSHUK: Yes, sir -- and then the appropriate corrective actions follow.

DR. SHACK: What fraction of your aging management program

really follows from your life cycle management and which part did you implement specifically for the license renewal considerations?

MR. DOROSHUK: We have -- from this particular evaluation, and I will talk about it later, about 450 plant programs that we have decided are necessary to manage aging post forty years, to ensure that the safety is maintained in a reasonable manner.

We have been involved over the last 10 years doing non-nuclear life cycle evaluations, whether it be do I replace the rubber-lined carbon steel piping in the salt water system, do I put titanium in instead, those types of evaluations do occur over time and are more directed at I have a decision, a long-term decision to make on a power production part of the plant. How do I rank the options? What is technically the most feasible, what is the most cost effective -- those occur and have occurred over the years and I don't have a number of how many of those we have done.

We have been able to make the appropriate recommendations with the plant on those types of decisions. In fact we stayed with rubber-lined carbon steel. The premium for titanium wasn't worth it. There are other areas of the plant where we have made recommendations to actually make changes to the way the plant is operating or the actual equipment.

This program can be viewed as change management. We are changing a culture. Aging is nothing new. We have been managing aging at the plants through our maintenance inspections, our replacement activities since the plant went into play -- went into operation. However, we haven't actually in this total approach looked at it from the standpoint of, as a dimension of the future operation, so we felt early-on that in order to change behavior that we needed to do this using integrated engineering teams. We couldn't do this in the home office and then deliver the product and have them say I didn't have any play or part in developing the solution.

These teams have been critical in evaluating the plant beyond the typical planning horizon.

The solutions? There have been clear expectations set and because these teams are diverse, the decisions and options have been challenged and have resulted in better decisions.

The integrated implementation of the customer buy-in has resulted in good measurements for success. How do we know what we were going to do or are going to do is going to work? It is a learning program. It is a change to the way we behave. We are not worried about us here in 1999 or 1998. We are concerned about the engineering staff who is at the plant in 2010. They will remember what we did here and continue to manage the aging.

DR. FONTANA: Do your decision analysis techniques involve, say, risk-informed prioritization?

MR. DOROSHUK: Yes. They can. Not the license renewal. In license renewal every system is equally important.

However, when you do the plant prioritization for work, that does come into effect, which mods should be considered over what modes, which ones should be done first.

DR. FONTANA: Thank you.

MR. DOROSHUK: Let's look specifically at license renewal now. We have been involved since the beginning. The NRC published the rule in 1990. We established ourselves very shortly, before that actually -- 1989. We began initiating the development of the process and procedures we could use right after the draft rule. We felt that in parallel with reviewing the rules and providing the NRC with comments and working with the Nuclear Energy Institute BG&E felt it was important to also be testing those rules somewhat in parallel, so we were developing procedures and trying them out, the rules out on the plant, in parallel.

In 1991 we did develop a methodology which helped provide the industry input into the NRC that the original rule perhaps had some flaws in it that needed to be corrected, primarily the age-related degradation unique to license renewal was an unworkable concept.

It didn't work, and so the fact that we had tried that process out on seven systems and had thousands of components to be able to support the input and provide the NRC for consideration we think was beneficial. The rule was amended in '95. We amended our process in '96. We submitted it in '96 and the NRC reviewed it and approved it through a final safety evaluation on the integrated plant assessment methodology.

We can probably count hundreds of interactions in the industry with NRC over this time period. This was a veryt good learning time period. Next slide.

Over the last several years alone, there have been no less than 60 public meetings. I have been using the number sixty for several weeks now. I think I can probably go up to 65 as we continue to click off the public meetings at a fairly good rate. They have been open at the plant. They have been held at local establishments. They have been held here at Headquarters, and the point I am trying to make here is that this process has been open not only between BG&E, NEI, EPRI and the NRC. It has been open to the public on a continuous basis.

There have been numerous rounds of available times for them to comment and participate.

In addition to the several formal public meetings held by the NRC, we have a Visitors Center and an ongoing outreach program at the plant to solicit public participation and that has resulted in about 3000 visitors a year and over 150 tours a year, so I guess up until the time we submitted it and the formal process once it has been submitted I think the doors have been open for all to review and comment.

The application itself was submitted in 1998. It was three volumes, as Dave pointed out, about 2000 pages. I guess you have it. Go to the next slide.

These are the parts of the rule that drove what is required in the application -- 54.19 talks about the general information that you need to include in it, 54.21, as the contents of the application with respect to the technical information, which is the primary topic of this afternoon and tomorrow. They include the integrated plant assessment results, the annual changes, the evaluation of the time-limited aging analysis, the UFSAR is required to be part of that application, the technical specification changes that you are going to perhaps propose,

and then the environmental report.

These are the parts of the rule that drove what we included in the documents that you have.

I would like to point out and I think it was discussed earlier that when we developed the actual application we did go through a fairly extensive development of a template. We think that was a very important part -- why don't you go to the next slide, Don -- of this because this slide tries to give you a picture of what the application actually is built off of, and I will go through all these acronyms, but at the very tip you have the application itself. Those are based on the aging management reviews, which is based on the scoping of the plant, which is based on the licensing basis of the plant, which relies on the plant test procedures and inspections, which relied on all the NRC documents of the current licensing basis for Calvert Cliffs, and generic information which includes also the external assessments, generic -- as you get further and further down this pyramid you begin to get into just the general engineering disciplines that make up your fundamental engineering decisions.

This is a very high level document. I can say that every -- the importance of the template, both for the technical part and the environmental part, were critical in being able to communicate the story, provide the NRC the necessary information so that they could start their review last summer. Yes, sir?

DR. KRESS: George Apostolakis is not here, but if he were I am sure he would like to ask the question of does PRA enter into this process anywhere at all?

MR. DOROSHUK: Yes, sir, it does. In the environmental report it is required that we perform a severe accident mitigation analysis for --

DR. KRESS: SAMA report.

MR. DOROSHUK: SAMA report, yes, sir. We had to take our PRA to a full Level 3 PRA. We looked at over 150 individual SAMAs that split out into actually more as you got into implementation.

We developed a screening process. We used the NRC guidelines for performing this, which were based on the Watts Bar SAMA. It was a very extensive analysis that I guess we are not going to discuss today or tomorrow.

Out of that we found that there was one severe accident mitigation analysis, one hardware change that we elected to perform. It was a particular change that resulted in a significant decrease in the internal flooding sequences in the PRA and we have initiated the actions to have that change made in the plant.

There were a number of items that -- I guess there were three items that came up that had nothing to do with aging that the NRC and Baltimore Gas & Electric both looked at them and did not make them part of the application but they are being handled under the IPE follow-up program, a very extensive analysis.

DR. KRESS: Did you use your IPE?

MR. DOROSHUK: Yes, sir.

DR. KRESS: The IPE and IPEEE. Not only did we take the guidelines off from the NRC published guidelines in the NUREG but we

looked at the advanced reactor SAMAs, recent SAMAs that were performed on the operating plants during OL stages as well as held several meetings with the NRC staff to ensure that this particular analysis was meeting the expectations of the Staff.

Every single sentence almost, and I will say almost, but every statement of fact, every single conclusion in the application has a reference to where it came from, so as you review it or as you have read it you probably noticed that in the bracketed parts of the paragraphs you will find that there is an auditability trail all the way through here, and I would point out at this point that the NRC review, the regional inspections have been extremely thorough.

They have chased down through vertical slices all the way down to these textbooks where we had debates on whose textbook was perhaps more current, so this was a very valuable exercise in auditability and well done.

I think it goes to saying that the principles of the rule, which you discussed earlier -- this has tested those principles. It allowed us to perform the surgery, if you will, on the current licensing basis with respect to aging, and has showed us that the current rule, although improvements could be made, does work. It does allow you to make good decisions with respect to aging.

The way we constructed the application -- next slide -- was consistent with the way we work, we do the work at the plant. We wanted to satisfy all the requirements in the template that was created but if you look at the rule, the rule itself just says give me a list of components, give me the aging management programs, and give me a roadmap on how you came up with those list of components.

It doesn't say anything about how did you evaluate operating experience, how did you divide the plant up? The template process and the standardization work that NEI will be doing over the next year or so with NRC would be very important.

We provided a summary of the scoping of the pre-evaluation of the aging management review activities conducted and we provided a summary of the relevant operating experience according to the template for the system as a whole to show the effectiveness of accredited programs and then of course provided the direct references.

This was applied on a system by system basis. That is the way we do work primarily at the plant is we have feedwater systems and we divided it that way. We will talk a little bit more about this particular approach in a second. Don, next slide?

There are two main sections of each LRA system or commodity chapter. The sections are scoping and aging management. In the scoping section we break the system down, basically we reach into the plant, we pull out the feedwater system and we describe what we pulled out so you know where all the interfaces are, you know where all the components, you know what the system was supposed to do, you know what the components are supposed to do, and you know what components that go into the formal aging management review, which is required by Part 54.

Then, the second part of that -- each chapter is the formal aging management review summary which shows -- we discuss how we evaluated the component groupings, how we determined the methods that we

are going to rely on to manage the aging, so those two sections you will see consistently in each chapter.

The process is very simple. You have the scoping, which systems and structures are within scope, what are their intended functions by the rule, what are the components that were required that contribute to those functions, and then we go into determining, under the pre-evaluation, this is our own plant-specific terminology, are the components, with intended functions that support the system, passive or active; are they periodically replaced; are they excluded by the rule.

These are screens so that we can get to the right set of components within each system, so that we can focus the engineering efforts. Then we look at the aging effects that could affect the components' functions and determine whether or not they're managed by existing activities or do we need to modify existing activities or develop new programs to manage the aging. It's a fairly simple approach.

DR. KRESS: On that diamond that says manage existing activities.

MR. DOROSHUK: Right.

DR. KRESS: Is that just asking whether such an activity existed or did you have some sort of criteria to say whether it was sufficient and necessary or good enough or adequate?

MR. DOROSHUK: Right. That's exactly what we did. We had a component or a group of components that were of similar material, et cetera, with effects, and we went and worked with the plant under Marv's area and implementation, and said what options -- what are we doing right now with respect to the aging and if we could take credit for those programs, they became existing credited programs, existing activities.

If we went into the plant and we found out that they needed to be modified a little bit to satisfy our unique focus -- for example, we've had some PMs that put the inspector in the vicinity of the component, but doesn't just quite tell him to look for general corrosion. It says inspect for condition. So we modified that existing activity to focus the inspector.

DR. KRESS: Will these programs then become part of your licensing basis or are they already part of it?

MR. DOROSHUK: Some of them are already part, but they become licensing commitments as part of the renewed license. They become part of the CLB.

DR. BONACA: Are you going to talk about demonstration at some point, give us some examples?

MR. DOROSHUK: Yes, I am.

DR. SHACK: Just where do your ARDIs fit into this process?

MR. DOROSHUK: They are under a new program. When -- why don't we hold off on that just a second and we'll get to how we selected certain things to do certain things.

Let's go to the next slide, scoping. Again, from a scoping perspective, we felt the most effective approach was to use two levels, which was a system level and the component level. That's the way we did business at Calvert Cliffs. That's the way we have our maintenance

system set up. You'll have another utility that might come in and say we manage it by programs.

You'll all come to the same answer for the individual components. To us, it was a logical and manageable piece to fit in. The active/passive determination was the final step. We call that the pre-evaluation, prior to going to the formal aging management review.

As I said, for the --

DR. KRESS: Excuse me. Did you have a formal criteria for deciding whether it was active or passive?

MR. DOROSHUK: Yes. We had formal criteria where it had to change -- it was a definition that's put in Part 54 for passive, which is change state --

DR. KRESS: It's the definition that's in the rule.

MR. DOROSHUK: Right. You want to add to that, John?

DR. KRESS: I'm familiar with what's in the rule.

MR. DOROSHUK: That's the criteria we used.

DR. KRESS: Thank you.

MR. DOROSHUK: The system level scoping allowed us to establish the boundaries. One of the concerns from the NRC in how we package this information is how do we know that the person reviewing the feedwater system and the person reviewing the condensate system knew where the interface was. So this allowed us to at least package that information for their review.

The tools we developed using the rule and then we applied these tools of our licensing basis to come up with the results.

The goals -- next slide - of the aging management review are to demonstrate that the effects of aging of the structures and components within the scope of licensing renewal and subject to an AMR, long-lived passive components that were left over are adequately managed.

We've done this by either recognizing that the particular component that we were about to do an aging management review was replaced every five years anyway. There is no need to go through a big formal aging management review since you're replacing it. Or you come in and you identify the plausible aging effects, age-related degradation mechanisms for each component. You evaluate those effects relative to the functions that we're concerned about, and then you determine the best manner in which these can be managed.

Next slide. There were certain component types throughout the plant that existed in every system that we felt would be better off or were unique to themselves to be evaluated in what we call the commodity aging review. Each commodity evaluation is documented. It's slightly different. The scope of evaluation is specified.

So if it was different from the way we did the system, we laid out the method on how it was a little bit different. The results were basically the same with respect to presenting the plausible aging and the program justifications.

There were six groups, electrical commodities, instrument lines, cranes and the fuel handling, fire protection, component supports, and cables.

You can see that these are like panels. Cables are self-explanatory. These are non-EQ. Component supports, and instrument lines are in every system. Fire protection is a very, very broad plant set of equipment and we felt it ought to be across-the-board just put in one chapter, and then cranes and fuel handling were a unique animal all by themselves and we just felt they just belonged together in one particular chapter.

So these are what we called our commodities. The rest of the plant was evaluated in its respective systems.

DR. MILLER: Now, electrical commodities, for example, are those that have already been deemed to be passive, right? Before they got into that group.

MR. DOROSHUK: Yes.

DR. MILLER: So you went through the diamonds and said, okay, these -- like fuses I notice are a big issue. These are now passive, so we'll put those in commodities.

MR. DOROSHUK: That's right.

DR. MILLER: I notice you also put pressure sensors, and maybe they could go either way, depending on where they are.

I'm just raising questions of how you came up with a list of electrical commodities, which is kind of a potpourri of a number of different issues.

MR. DOROSHUK: Do you want to identify yourself?

MR. RYCYNA: I'm John Rycyna. I'm the Evaluation Project Manager. Electrical commodities generally consist of panels, the steel boxes that hold electrical components, as well as plastic supports for various things inside the panels.

Other electrical things you mentioned, such as pressure transducers, level transducers, other types of transducers, some of those are specifically excluded by the wording in the rules. Others, which were not, which have a pressure boundary function, as well as an electrical function, we looked at for pressure boundary.

DR. MILLER: So they then went into electrical commodity.

MR. RYCYNA: No, sir, they did not.

DR. MILLER: I was just wanting to get clear on your process. I'll ask for more details as we go on.

DR. SHACK: Just another. Back on your flow diagram, each of those diamonds, do those diamonds really represent expert panels? Is that who is making these decisions and determinations?

MR. DOROSHUK: Those are procedural steps within the process, that have specific procedures written for them, that the engineer performing the work uses the plant information, puts it together, assembles it. It is a hundred percent checked under our QA program and then it was reviewed by the plant, by the plant safety committees, and then by the off-site safety review committee, each one of these, each conclusion, each step.

DR. MILLER: So in a way, you have three expert panels.

MR. DOROSHUK: Yes, and they were sometimes very painful. They were very healthy, though.

Next slide. I guess I probably should have put this up a little bit earlier. A couple of key definitions in the way we have

defined the world of aging. We consider an aging effect potential if the mechanism for a given component, if he concludes that it could occur, in application of the equipment throughout the plant, with conducive environmental conditions.

This is a very broad net. This is a piece of steel, in air, what type of aging effects could be potential. So we throw a very broad net and the initial pass-through of looking at the individual components and the materials just to make sure we have a complete list.

We then, through the evaluation, declare an aging mechanism plausible for a specific component when allowed -- if it's allowed to continue without any preventive mitigative measures or enhanced monitoring techniques, we couldn't show that the component would be able to maintain its capability to perform its intended function.

It's a long sentence, but if the aging effect was considered to be plausible or necessary to be managed, if we couldn't show that we could operate without doing anything. So that focused the net down to a very small -- a smaller one to the final screen in the aging management review.

The plausibility determination -- next slide -- considered the materials and the environment, NRC and industry information, plant-specific information, and the effects on the individual passive intended functions that we were concerned about for the individual component.

DR. SHACK: Now, how was this determination made?

MR. DOROSHUK: Through the same type of engineering teams, where the individual reviewers, mostly disciplined at this point, mechanical, civil, electrical, would perform the evaluation, have it second-checked, and brought through the plant, through the materials groups, et cetera, with the appropriate reviews, through the safety committees.

We then, once we have determined that, look at what it is we need to manage the aging effects of the particular component of concern and our criteria dealt with what were the appropriate methods available, what was the periodicity of the inspection activity or activity itself, what was the acceptance criteria, and we were measuring the acceptability of an aging management program relative to the functions and the aging effects that we were concerned on, and looking at operating experience to determine whether or not it had been effective or would continue to be effective.

That was part of the discussion that Sam Lee had on that open item and this is the key to operating experience is there needs to be some substantial evidence, in our minds, that this program has been effective.

We look at two-pronged approach typically throughout the application. When we have a component and an aging effect, we look at is there a mitigative action that's in play, that can slow down or mitigate, and then we validate it through a discovery activity, such as a field inspection.

So you take erosion/corrosion of feedwater and we have secondary water chemistry which creates a less aggressive environment, but we also recognize we need to continue to monitor that through the

inspection activities.

DR. KRESS: Would that be continued to be monitored for the rest of the life of the plant?

MR. DOROSHUK: For the areas that we -- yes. These programs would exist throughout the rest of the life of the plant.

We also look at, from a programmatic standpoint, are these programs self-correcting, do they teach themselves how to be better through our corrective action program, what's the foundation of the program itself, was it based on codes and standards, et cetera, and was the program administratively controlled so that those people around in 2010 would understand that they weren't allowed to change this with specific consideration.

DR. FONTANA: That raises an issue that's been in the back of my mind. It seems that we focus a lot on aging of equipment, system and that sort of thing, and I don't see too much on aging of the people and replacement of the people and the people who are retiring and no one is coming in and keeping the same philosophy throughout this.

MR. DOROSHUK: Go back to the beginning, when I started talking, I said this is really -- it's important to understand the technical and do the right things, but you're changing behavior.

DR. FONTANA: Yes.

MR. DOROSHUK: You have to change the culture and add that dimension on to it, or else you run into problems like that. This wouldn't be the first time where people forget to do things.

As I said earlier, the types of programs we credited in the application are three types; existing programs, modified existing, and new programs. About 456.3 activities, to be exact -- no, I'm kidding -- 456 different procedures and activities in the application and that number can change, depending upon how we actually identify the commitment, and we'll talk about how that might happen.

The selection of the programs involve, again, the integrated teaming efforts of the integrated plant assessment engineering group, John Rycyna's group; Marv Bowman's group, the implementation engineering group; the plant system engineers and system managers who own the actual equipment organizationally; and the program experts, whether it be material, maintenance, et cetera.

Considerations; we need to get these programs selected prior to the final approval of the aging management review report, so they can go into the application, and that is the first final approval. We have found that things change after we implement and things like that, and we'll talk about that, and the staff has told us to change things.

The method; there is a point, at this point, where we can begin to group things internally and bring them down from the system level down to the more programmatic level.

So in our case, we heard earlier the Oconee application groups things by program. Well, we kept that grouping at the site and that's the way -- we didn't put that in the application. So that step for us was just kept on-site as opposed to put in organized that way in their particular application.

This next slide shows you the breakdown of the 456 programs. There are 329 existing programs. We'll talk about those. There were

101 programs that required modification and there were 16 new programs.

This gave us a good feeling when we were all done, after many, many years of work, that plants, at least Calvert Cliffs, and I'm sure this is representative of the industry, we do manage aging already. This is not a new phenomena. We do recognize, however, there are areas of the plant that should be looked at for long-term perspective.

So this breakdown gave us a lot of confidence and gave BG&E management the confidence that we were doing a good job managing aging today. So when you look back at the principals, the fundamentals of the rule that came out of the regulatory analysis, the CLB is adequate, with the exception of management of aging, this confirms that those fundamental principals were correct.

This is the breakdown of the existing programs and you can call these things different things from site to site. 309 of the 430 existing programs were in the preventive maintenance program themselves. There were ten maintenance programs, chemistry procedures, 15 operating procedures, four engineering programs, 25 maintenance procedures, and we can pause here to perhaps talk about examples in each one of these, if it's not clear what they might be.

Chemistry obviously is a secondary. Primary water chemistry engineering programs would be like fatigue management. Preventive maintenance tasks would be the field checklists where they go in and actually inspect and do the actual inspections on the components.

DR. SHACK: This is still talking about these passive components, right?

MR. DOROSHUK: Yes.

DR. SHACK: Preventive maintenance on the passive components.

MR. DOROSHUK: Right.

DR. SHACK: 309 of them.

MR. DOROSHUK: Already -- well, of the -- that's 309 of the 430. If we go back to the previous slide, what this kind of does is lump the existing and the modified together and even though we had to make some modifications to the existing programs, 430 of these existed in a shell form or at least on-site already.

And the modifications can range from, again, like I said earlier, it may have put the inspector in the vicinity of the component and maybe looking at the component for one reason and the procedure itself wasn't clear enough to say "and look for this particular aging effect."

So we're going to modify that procedure, so that inspector has that level of detail of instructions to record his observations. Another modification might be we've added components to a particular program.

Mark, is there another good example of existing programs that we're modifying?

MR. BOWMAN: I'm Marvin Bowman. I'm the lead implementations engineer. Those are the two basic modifications we came up with. Some modifications to like the engineering programs are a little bit different from that. The fatigue program is an example.

MR. DOROSHUK: Sure. We may have added components to

monitor or done a special evaluation inside the fatigue monitor. Let's go back to the detail slide.

DR. FONTANA: With that many programs, how many programs might one person be required to be responsible for, for example?

MR. DOROSHUK: The fatigue monitoring program, we have a full-time engineer who implements that program and that -- it works in the life cycle management project. That's where that responsibility or function is implemented. They, in turn -- we, in turn, provide that information to design, who does the semi-annual reviews and the acceptance and the validation of the fatigue information that's taken from the plant.

The fatigue engineer relies and works with the plant engineers and the plant computer to extract the information and to make sure that transients are counted appropriately, transients as opposed to data scatter.

So there is a network even around an individual that is used and built to implement these programs. Down to the individual rover, who may be assigned to go do the individual inspection, of course, that preventive maintenance task would be assigned at an appropriate level for the inspector.

But, again, the program is administered and reviewed by several layers of supervision and the review of the results.

DR. FONTANA: It seems like a lot of programs. I was just wondering how much of a load it is to keep up with them for specific persons.

MR. DOROSHUK: Again, these programs already exist and they are already part of our infrastructure at the site.

DR. MILLER: So one engineer may have responsibility for 20 or 30 preventive maintenance programs.

MR. DOROSHUK: Could.

DR. MILLER: So one engineer may have responsibility for a grouping of preventive maintenance programs.

MR. DOROSHUK: Yes.

DR. MILLER: Or surveillance programs.

MR. HEIBEL: My name is Dick Heibel. The preventive maintenance program is -- there's five engineers/technicians that provide the management of it. Each PM is assigned to a component in a system and that system engineer is responsible to review the PMs and make sure that they're upgraded. And when these PMs were reviewed for aging management, that was the path they took. They took the path through the administration part down to the system engineer, got concurrence that the PM change or the PM adequately covered that.

So an engineer may have in his system maybe 60 PMs, but he has an awful lot of assistance in tech manual changes and all that from another group to make sure his PMs are kept up-to-date.

DR. MILLER: So I pick the example of I&C, the chief I&C engineer may be theoretically responsible for the I&C PMs and he has a lot of people with him to keep up with it.

MR. DOROSHUK: Theoretically.

MR. HEIBEL: Theoretically, all the I&C PMs would go through the head I&C engineer, but his staff would be the ones that would

develop them and work them up.

MR. DOROSHUK: Next slide. A breakdown of the new programs, the modified programs, I guess. We had six that we had to extend the existing engineering analysis on or perform additional activities. One was the -- we had some non-pressure boundary alloy 600 components that we needed to add to the alloy 600 program. We had a time limited aging analysis on the spent fuel rack neutron absorber. We had fatigue evaluations, seven fatigue evaluations or seven sections that identified fatigue evaluations that were necessary.

We had, of course, the LTOP and PT curve time limited aging analysis that needed to be conducted.

DR. SHACK: I assume you had PTS, also, in there.

MR. DOROSHUK: PTS was already analyzed for 60 years for Calvert Cliffs Units 1 and 2 and the SER, in 1995, was approved for 60 years and beyond. So PTS is not an issue for either one of the unit's vessels. So it was previously approved. So that's why it doesn't show up there.

Three new engineering analyses. We had a leak before break analysis that we're committing to do on the RWST penetrations, some stress relaxation of CEA shroud bolts and core shroud tie rods. We have a -- this is one of the issues that we worked very well with the staff defining the criteria on, the thermal aging of cast-off synthetic stainless steel.

So these are the areas where we really had good technical exchanges, because we're in a new program area and we had engineering people providing their background from this organization, from EPRI, from NEI, from consultants that were bringing to bear quite an extensive amount if information to define the requirements.

This was a particular, I think, good success story, where everybody came together and did the right -- came up with the right answers.

New inspection programs. Here you can see the already -- you can see that there was a number of sections in the LRA that relied on this sampling inspection approach, where we had large numbers of components, instrument lines, mechanical places, valves, where you had a system-wide type of aging effect. It might be general corrosion and it was not subjected to the more focused ISI type of approach, where you're looking at spot-checking.

So we had to develop these types of inspection sampling programs so that we were able to, with respect to these aging effects that were more system-wide, identify the sample points, how we were going to inspect it, what was the acceptance criteria.

So you can see there were a number of sections in the application that will be relying on these sampled inspections.

DR. SHACK: That part made sense. What I had a hard time understanding was the one-time nature of the inspection and how you were sure that the one-time inspection assured that you were okay for the next 20 years.

MR. DOROSHUK: Well, that was part of, I think, the discussions we had with the staff, and that is how do you know you weren't inspecting too soon, was the incubation period such that you

should be doing it close to year 39, and I believe what we focused in on was making sure that we had the right samples, doing it -- we were going to be doing it later in life, and relying on the corrective action program to appropriately expand the sample.

Our acceptance criteria will also play a very important role and that is for most of these mechanical items, the acceptance criteria is any observable condition. So we set the threshold so low that if we open up a valve and look while inspecting the valve and we see pitting, we would step back and do the corrective action program at that point. We weren't going to try to pre-analyze what the pit size that the inspector would look at, because then there would be too much debate.

So we think we were able to address that by the broad sample and the very low acceptance criteria.

DR. SHACK: Okay. I'm still having trouble with the one time. Presumably, we'll get some more discussion of that tomorrow.

MR. BOWMAN: Marvin Bowman, again, lead implementations engineer. It's only one time if you don't find anything. If you find anything, then that takes you already to your Appendix B corrective action program into looking at what are the generic implications, what are the actions to prevent reoccurrence, and do you need to do additional inspections not only at this point in time, but with broader scope, but do you need to do additional inspections down the road, depending on what the trend is so far.

So they're only time if you don't find anything and we typically credited ARDI where we -- we had difficulty concluding that something was not plausible. It was almost not plausible, but we wanted confirmation. For example, for the chemistry program, we've isolated parts of the system.

DR. BONACA: This program, the whole thing involves a lot of monitoring, and I would like to understand better the relationship between your system engineers, which are responsible for groups of systems, and the life cycle management engineers, which are responsible for, I guess, some portion of those activities, of monitoring and testing.

MR. DOROSHUK: Well, it's primarily the relationship occurs through the teaming and the analysis, where we go through the aging evaluation and have different points along the way where we're making decisions. We would get with the plant responsible groups and then get them to agree with our decisions.

So each phase in that, so to speak, process, you have that type of check. Once we get to the conclusions, which is this is the aging management program, we work exclusively with the system engineer and the program owner.

So the actual engineering group that's going to implement it is the one that we sit down with and go through the steps and get their -- get them to develop the actual steps in these new program areas. Then that goes into our control system and they take ownership.

I'm not sure if that --

DR. BONACA: I understand that. So for example, if you have a specific issue that you have to monitor which has to do with a specific nozzle of a component, the system engineers will, at that

point, once the program is established, maintain tracking of those activities.

MR. DOROSHUK: That's right. The institutionalization of these aging management programs we view as our project close-out.

DR. BONACA: So you close out the project that you have. I'm trying to understand how you maintain the memory of these hundreds of commitments.

MR. DOROSHUK: Why don't you go to the next slide? That was a good lead-in.

We recognize that there are going to be changes, I think there have been changes throughout the review. There have been changes throughout our implementation and there are going to be changes subsequent to the receipt of the applications.

Again, I think the interesting thing here is that we're -- I don't believe we're -- we haven't discovered anything new, this is not a new technology, but it's that technology mindset that causes us to -- I guess we're in the behavioral change. So why don't we go into the next slide.

We recognize that there will be hardware changes that will need to be managed. If we have rubber-lined carbon steel piping in salt water and we go to titanium, it may not make any sense to do ultrasonic testing of it anymore. So we have to be able to implement these aging programs so that when we make a change to the plant, we recognize the change coming out.

If the intended functions change, if there is a regulation that changes and adds a new function or we discover a new function, that would have to be added to it; what if a component took on a new function because I changed a system and I had not evaluated that component and function pair as part of this application, that would have to be managed.

In order to do that, not only do we maintain the configuration of the programmatic aspects, but when John was finished doing all the screening at the component level, and I can't tell you how many thousands of components there were, I don't have that number, each one of those components are in the site database and are protected by a flag that we call long-lived passive.

So when the plant goes to change that long-lived passive component out and we have put the hooks in the modification process procedures on-site, there will be a consideration on the hardware side with respect to the license renewal application. There will be a consideration with respect to the function and the aging management and then there will be a loop into the program that manages that particular set of aging effects we're concerned about.

So it's a number of hooks you have to put in place. We think we've built the infrastructure at this point appropriately and that's what we're doing at this point, besides finishing up the work with NRC, is that type of protection against changes.

We've already had some. We had a complete heat exchanger change-out and the service water system, where we went from the tube-type heat exchangers to plate and frame, and those heat exchangers are in the scope of license renewal, and that invalidated the entire

aging evaluation that was part of the original application. We had to redo the analysis and make that part of the update.

So we think we've had some run time with this change management, as well.

Our investigations are complete. As I said, I think the implementation is well underway. We have found that extended plant service can be achieved safely. We believe, as well as looking at the cost of implementing these things, that we can do it and remain competitive. The impacts of these plant programs to monitor aging are well within the benefits of the cost of implementing license renewal.

Next slide. The status of the review, Dave hit some of these high points. I want to point out that for a new process, the rules, although could be improved, they do work. Part 51 and Part 54, we think that the NRC is doing an excellent job working through a new process. We find them to be very thorough. We find the region inspection teams to be very aggressive, but very open to the new process, and BG&E management is pleased with the way the review is going.

That's not to say that everything is rosy. We have hit hard issues and we do sit around the table in public meetings and exchange letters, making some very tough decisions on what's the right thing to do. I think that from BGE's perspective, that's the goal that we see the staff trying to achieve, and that is what is the right thing to do, and that ties into the 54.29 finding, which is what is reasonable assurance.

So for a new process, I think everyone is doing the right thing.

Next slide. Overall schedule, starting to get to the final milestones here. Today and tomorrow is your meeting. We have the comment period on the draft supplemental environmental impact statement closes the comment period there July 19th.

We have an action to complete the responses to the open items and the confirmatory items and the accuracy review of the safety evaluation report. That was issued on March 21st and we're on schedule to hit that milestone. Again, we have a management meeting month-to-month, which is not shown here. You can see there were a couple here, January, February. We did not have one in April, but we'll have one on May 12th, and those have been very good for facilitating the review.

Next slide. Yes, sir?

DR. SHACK: Can you be specific on what parts of the rule you have problems with?

MR. DOROSHUK: Well, I think one of the bigger things we struggled with was how do you -- you have 430 programs that are existing, how -- we don't want -- I don't think the staff wants to review every single one, every single time, especially if they're mirror images at every facility.

So how can these reviews here and at Oconee and through the work that's being done through NEI, how we can make that process go smoother, if it's a "me, too, I have an EQ program." Now, we worked through EQ. This was a classic example of an existing program. It's

embedded in a rule. It's got, what, almost 15 years of run time. We've all got SERs on it. It's got a generic safety issue on it. So we've got that flavor. So this was a really good example for everyone to work through.

But when we did get through with the reviews and to the SER, they found that the program was adequate for BGE, for the license renewal period.

There is a significant amount of generic lessons learned that everyone should be able to extract from that, so that Turkey Point, et cetera, et cetera, doesn't have to repeat and that is part of what you didn't see on the priority one -- on the priority one issues, that wasn't a priority one issue, but it is an issue at very high levels of attention that everybody is working to make improvements.

MR. GRIMES: EQ is on the priority one list and right now the whole issue about how do we get appropriate credit for existing programs is one that we share, as well, because the NRC staff realizes that we need to be able to apply our time more effectively and we don't want to spend time covering the same ground.

And through these first two application reviews, with the differences in the way that the applications were constructed and, at the same time, the question about what constitutes an appropriate measure for technically justifying a demonstrated effectiveness to manage aging, and, at the same time, only make that finding at a reasonable assurance level.

That's the challenge before us. We view that challenge as being one of the implementation details, not a fundamental problem with the rule, although it could go either way. We could go back and say, well, let's fine tune the rule and clarify what its purpose is, but at the present time, we're preparing to go to the Commission the end of May with a paper that explains the controversy surrounding credit for existing programs and what would constitute the basis for further streamlining the review process.

MR. DOROSHUK: I think this will be important when you look at the next 101 plants that are in line and if they all come in in the next five to six years, that we probably need to make sure we're learning, we need to make sure we're improving the process, both from the industry side and through the NRC review, and if we can make it more streamlined and still meet your public charter to ensuring safety, then we ought to do that.

DR. BONACA: You are going to get an SER probably -- I don't know. You have a question here regarding schedule. It says that sometime after this year, hopefully you'll get a Commission decision on application, and there are still about 15 years to go before this plant reach its 40 year life, right?

MR. DOROSHUK: Yes, sir.

DR. BONACA: So I guess between now and then, you'll have a lot of changes in this life cycle management, just because your ability to see problems is going to be improving, particularly if it's been like this in the past, and also new phenomenon may be new things.

So I guess what I'm trying to understand, this is really pretty unique as a program, it's a leading problem, where changes are

going to be -- sure, there are going to be other changes coming in and, again, I'm trying to understand how this configuration management of this program is going to really support, in the long-haul, how you're going to incorporate all these new findings or new activities that you have to perform as you go through.

MR. DOROSHUK: Right now we have about 20 people doing that, focused on making sure all of the material we have here can get somehow melded in with the rest of the culture of the site. I can't -- if I could tell you how it was going to turn out ten years from now, I'd love to.

DR. BONACA: No, I'm not --

MR. DOROSHUK: But we are learning and it's a very challenging experience. But the whole plant has recognized that we're not looking at 2005, we are looking at 2036, and they've got a vision themselves. So they have adopted that vision and we can see the attention and that behavior changing.

DR. BONACA: I guess I was more thinking about how do you link with the rest of the industry, because these issues are industry-wide.

MR. DOROSHUK: We are a member --

DR. BONACA: Also, EPRI.

MR. DOROSHUK: Right. We are a member of the Life Cycle Management Subcommittee. EPRI has a full committee, which is made up of almost 100 percent of the utilities, John, is that right?

MR. RYCYNA: Pretty much.

MR. DOROSHUK: And we have -- this committee has been in place since 1990, '91. We have -- BG&E has published all of its work through this committee and it's available to the industry. We've put it on CD-ROM. We have the memory set coming out pretty soon which will have that entire pyramid on it that we showed earlier. We hold workshops.

So we're doing a very extensive job through EPRI and through the Nuclear Energy Institute to make sure that these things are transferred.

DR. BONACA: So you're going to get this new experience and feed it from the industry into your programs and your inspections.

MR. DOROSHUK: Right.

DR. BONACA: How does the NRC maintain its confidence that the SER that was provided in 1999 is still good in the year 2009, that kind of issue.

MR. GRIMES: That gets back to the fundamental premise or principle for license renewal, which is the current licensing basis and its underlying processes carry over to the period of extended operation. Upon the conclusion of this review, we have now established a new licensing basis for 60 years of plant operation, but under-girding that is the overall regulatory process that is now more sensitive to operational experience and events that have aging implications.

Up until now, we have looked at things from the standpoint of managing the facility and now this experience has taught us the importance of not only the hardware, but the software associated with these programs that basically maintain the integrity of the overall

plant.

So we rely on that process continuing in the future. Fifteen or 20 years from now, if a new aging effect becomes evident, we would expect that the process will protect us to identify that it's a concern that needs to be addressed and then to provide appropriate means for establishing the regulatory requirements that should be satisfied.

DR. BONACA: You're not going to revisit this issue the day before you step into the 41st year.

MR. GRIMES: No, sir. As a matter of fact, the concept of continuity from year 39 through the period of extended operation is very important to the principle and the process.

DR. MILLER: So in a way, when the SER is signed off, then the license is for the next 20-plus X years.

MR. GRIMES: That's correct.

DR. MILLER: So if it's signed off in the year 2006 and since you have a 30-year life extension, is that the way it is? Of course, then you have a living document to keep as a kind of check point.

MR. GRIMES: It ends up being a 60-year life.

DR. MILLER: A total of 60 years, but it's 30 more years.

MR. GRIMES: We give them a new license, so there is no confusion. It will have a brand new expiration date on it.

DR. MILLER: Which will be 2036.

MR. DOROSHUK: '34 and '36.

DR. MILLER: I had a couple of questions on the process. I want to go back to those.

MR. DOROSHUK: Okay.

DR. MILLER: Go back to the slide you had on diamonds.

MR. DOROSHUK: The process.

DR. MILLER: When you get all done with, say, one of those last diamonds and you have yes's, say.

MR. DOROSHUK: And you go down here.

DR. MILLER: Right. Well, what I really want to ask you is when you get -- each time you go through a diamond, you exclude things.

MR. DOROSHUK: Right.

DR. MILLER: When you get all done --

MR. DOROSHUK: Or include things.

DR. MILLER: Or include things, true. When you're all done with the pipeline, you have X number of items or systems and so forth.

MR. DOROSHUK: Right.

DR. MILLER: And then the NRC went through and, as you pointed out, did a very thorough evaluation of this process. My question is, what percent changes did you make in what you did once the NRC went through and did their thorough evaluation? Any idea of that number?

MR. DOROSHUK: Let me give you an example. On the regional inspection for scoping, when they came down in February --

DR. MILLER: That's the high level.

MR. DOROSHUK: No. This was all the way down.

DR. MILLER: That's all the way down.

MR. DOROSHUK: This is a full-blown scoping inspection, with

a team of about ten inspectors from region and headquarters, and, in fact, Region II participated as well. They selected certain systems and structures, ten to 15 that we said were in scope, but then they stepped back and said, well, in order to fully verify how well you exclude things, we're going to pick five systems and structures that were not in the scope of your license renewal, but were high risk according to the IPE, for example, and we're going to go check and see how well you did making your decisions and they took those systems independently through the process themselves.

They used our procedures, our databases, and they found in every case, except two areas, two specific things that they could not conclude that they agreed with us, and that was, one was a policy issue. Was a non-safety-related building around a non-safety-related diesel, should that be included in scope, and we believed the rule says you don't, in cascade, in non-safety-related areas at all, and there was a question on whether or not that was correct.

So that's being reviewed by headquarters as an item that I think Dave talked about. So BGE says, okay, well, this is an interpretation of the rule; if you interpret the rule to be that way, I guess we'll have to put that in. It's not a point of disagreement. It's a question of is the rule being implemented. So that's very thorough.

The second item, which was probably the one that really made me step back and say how thorough this was, was in the fire protection part of the plant, and it's a broad plan and there's a couple of fire pumps that are out in the building called a fire pump house.

In between these two pumps is a concrete berm, a curb, that basically is there so that if the oil from one -- the oil-driven pump spills and catches fire, it won't drip onto the other pump.

So the question was, was this berm important, and if you look at fire protection, the fire protection licensing basis at our plant and other plants, the commitments are all somewhat different, depending upon how you implemented it.

This particular credit for this berm was in the gray area; was it truly part of the fire protection licensing basis or was it not. We couldn't say to ourselves it's not entirely and so we agreed with the staff and we included that concrete berm. We pulled it out of here and put it up here.

So for the staff to take those five systems that were high risk, go through component by component and agree with that level of investigation, with all except for a concrete berm, gave us confidence that the inspection team really pulsed the system in this box that you're questioning.

So it's a long story, but I thought it was a good story to tell.

DR. MILLER: So you came close to answering the question. I was looking for kind of a percent. Each one of those steps requires a lot of judgment. Of course, your judgment as a team might be slightly different than the NRC's. I'm really questioning what percent number was the judgment of NRC maybe slightly different or different than yours. Say, two out of so many --

MR. DOROSHUK: Thousands.

DR. MILLER: Thousands.

MR. DOROSHUK: Thousands of components.

DR. MILLER: We're talking about maybe .1 or .2 percent.

MR. DOROSHUK: Less.

DR. MILLER: Or less. Where the judgment or the collective judgment of the NRC and the collective judgment of your engineering staff may have had a gray level disagreement.

MR. DOROSHUK: They probably inspected upwards of, I don't know, 15 to 20,000 components, if you took a look at all those systems combined. The license renewal scoping is fairly on-off type of a decision; it's either credited or it's not credited, and we do not shade things from a risk perspective. We either credit it in the licensing basis or we don't.

So in this particular case, it was -- we went, in fact, all the way through the audit trail of documentation on the docket, NRC correspondence and we drew the conclusion there wasn't any, but they didn't agree with that, so we put it in.

MR. GRIMES: I would share that view, although we have a different perspective. I thought it was six inspectors for four days. So we don't really have an appreciation for the impact on the utility.

DR. MILLER: That may be perspective.

MR. GRIMES: And we looked at hundreds of things, while they looked at tens of thousands of things. Out of the hundreds of things, we ended up with a handful of findings, two of which rose to a level of significance and we agreed, they took one and we took one. So two out of hundreds, in our view, constitutes a basis for saying there's reasonable assurance the process has worked.

We will probably come to similar conclusions when we wash out the rest of the safety evaluation. We'll find that while there are still some controversies, as is reflected in the open items and the generic renewal issues, on implementation details, that on the whole, we're satisfied that the level of these details is so minute that the broader finding is that we've got the same conceptual idea about what is passive and long-lived and what requires an aging management review and what is an appropriate aging management program.

So that's essentially where we think we're headed based on what we've presented in this safety evaluation report and our initial inspection findings.

DR. MILLER: I have another question on the previous, the big pyramid, it was about two overheads before that.

MR. DOROSHUK: Okay.

DR. MILLER: If I understood what you were saying to me, that you started at the high system level and went through all these different procedures and plans and so forth, and you documented everything, tracked everything down to the real very basics, you felt the bottom of the generic basics were a set of codes and textbooks and EPRI reports and standards.

Now, if I go and look at your LRA, which I have in my hand, and I look at all the references for different chapters, I should find codes and standards, EPRI reports and so forth.

MR. DOROSHUK: Yes.

DR. MILLER: Now, I did my own spot check in about ten minutes and I looked at, say, environmental qualification. Now, in the area of I&C, environmental qualification, the basic standard is IEEE-323. Yet I didn't find it in your reference.

MR. DOROSHUK: You'll find it in the procedure that's referenced.

DR. MILLER: So someplace in there, buried within what -- there's a lot of reference to the CCNPP, which is Calvert Cliffs. So it's buried within those procedures.

MR. DOROSHUK: In these plant procedures, you'll find ties to --

DR. MILLER: So that's where I'll find them.

MR. DOROSHUK: You can find them there.

DR. MILLER: Because most of the references were CCNPP references and not basic codes and standards.

MR. DOROSHUK: Right. In fact, when we reference an aging management review report, if you go in there, you can get down to the individual component level, the individual aging and then the individual textbook that we used to make a particular call on an aging effect, inside this document here, as aging management review report.

DR. MILLER: Right.

MR. DOROSHUK: So that will be separate from a plant procedure that you'll see referenced, that will also have ties. So you're right. The string that you'd pull, you would have to come to the site and pull the string all the way through.

DR. MILLER: So if I called up the site and said I need CCNPP bla-bla number document, where you reference environmental qualifications, I'll find IEEE-323.

MR. DOROSHUK: I would say yes.

DR. MILLER: So the audit trail, in a sense, in this document, is one level above, what I would define as one level above what you put in that pyramid.

MR. DOROSHUK: Well, there are EPRI reports, there are --

DR. MILLER: There are some textbooks.

MR. DOROSHUK: There are some. You've got a splattering. But for efficiency, the conclusion, where the conclusion was drawn here, if it was drawn there, then the reference was put there. Then you'll go see that conclusion and that reference will put you there and may drive you there and then it's sort of a cascade type thing, that each decision should have a supporting reference.

DR. MILLER: There are a number of EPRI documents and there's a smattering of textbooks.

MR. DOROSHUK: There's an enormous amount of information on-site. Just at this top area, integrated plant assessment, probably each system chapter has a series of five to ten -- I don't know -- maybe not -- two to three manuals itself that's license renewal unique.

DR. MILLER: Maybe I can ask this of the NRC. Did the NRC look at this pyramid as part of their audit process, in addition to the set of diamonds?

MR. GRIMES: Yes. As a matter of fact, we stumbled into the

procedures and tried to pull the string to get down to the -- as Barth mentioned before, we did some reviews that constituted vertical slices all the way down and, of course, we went in and thrashed around in environmental qualification and made a big mess and stink and tore it apart and put it back together again.

So part of our review process is trying to pick smart samples to go look for what some of the underlying documentation is.

In the review itself, we did that through questions and dialogue and also as part of the inspection.

MR. DOROSHUK: And in the inspection, they not only went up and down this pyramid, they went out and they said, okay, now, take me to that particular component in the plant or let me climb into this building and let me look at the actual physical structure as exists today, and that was both in the containment, it was not just take me on a general tour.

We were in confined spaces, we were in radiation areas, we took advantage of the fact that we were in an outage and took a good physical look to supplement the inspection team's evaluation in the offices.

DR. MILLER: I want to go back to the diamonds. I'm going to ask a question that maybe my colleague, George Apostolakis, who is not here, might ask.

In going through all the decision-making, those diamonds, would it be, had been, or did you use some risk insights in making those decisions?

MR. DOROSHUK: No, sir.

DR. MILLER: Would it have been of value if you had used risk insights? Would that have made your decision process more efficient, more effective, maybe you would have excluded more or included more? Maybe the NRC can help me out on that question.

MR. DOROSHUK: The way the rule is constructed, it doesn't allow you take advantage of that type of approach. We used more of a -- in other words, the rule says it's in or out. There is no risk-informed anything. So you don't get a chance.

It's part of your licensing basis. The maintenance rule, which tends to sit up on top of the passive parts of the plant, takes into the -- takes that into account and builds -- includes the rest of the plant in that monitoring envelope, if you will.

So where the PRA comes in, which is primarily in the active functions and the execution of sequences, the license renewal rule doesn't go after it. You don't model a piece of concrete in PRA. So the compliment of the maintenance rule is really those two regulations fit very nicely with each other.

Would it have helped us? It would have -- if you go to the maintenance rule, you'll see -- not only will you see the license renewal scope, but you'll see all of the active equipment of the plant there and so that is an ongoing monitoring system, really puts the icing on the cake, if you'll allow me to use that.

DR. MILLER: Well, I wasn't necessarily implying only the PRA. I was implying maybe a little higher level risk insight.

MR. DOROSHUK: Well, we do. In the program selection, when

we worked with the teams, we used more -- we used a qualitative type of approach and that is, how aggressive is the aging, how much is going to degrade the function.

And for aging that's on the periphery and it's -- we can't prove that it's not happening, it's not worth us expending the resources, we used that qualitative risk to say, well, maybe we need just a one-time inspection somewhere near the end of 40 to confirm that it's not degrading the function of the component.

So to a certain extent, the risk-informed operating experience and plant experience is used in the selection of the plant activity, but it's not a calculated measure.

DR. MILLER: It's just part of your qualitative judgment.

MR. DOROSHUK: Yes, sir.

MR. GRIMES: I'll offer, since Dr. Apostolakis asked the question before, that --

DR. MILLER: He'll ask it next week.

MR. GRIMES: Well, I'm going to head him off, I hope. Right now, we're working on implementation details simply to extrapolate and extend this current licensing fabric into a period of extended operation for 20 years. And it's tough enough to try and keep sanity using deterministic techniques to go through a screening process.

But I envision a time in the future when both license renewal, scoping and screening has matured, and graded QA, and risk-informed ISI have matured, that they eventually can blend together.

But in the meantime, this is not a risk-informed regulation and I think it's premature to expect license renewal to be risk-informed, until some of these other initiatives have matured.

DR. MILLER: So in other words, if we were doing license renewal on a plant, say, ten years from now, we would presume that there would be, to use your words, more blending than what we're doing; that using a risk-informed approach in places might be of value.

MR. GRIMES: That's correct.

DR. MILLER: Certainly I would think many are still going to be deterministic.

MR. MATTHEWS: Ten years from now, the licensing basis itself may be more risk-informed. Therefore, the precepts associated with its continuation into the renewed period would reflect the fact that it was a more risk-informed licensing basis that we were focusing our concern on with regard to continuity in maintenance.

So, yes, I think what you said is right.

DR. MILLER: When you use the word maybe, there's a lot of people whose dead bodies will be -- if it is, will be, not maybe.

MR. MATTHEWS: That's true, except in the instance that the Commission does persist in making a more risk-informed Part 50 a voluntary program.

MR. DOROSHUK: Next slide. I wish John Fair hadn't left so quickly. I wanted him to see this first bullet, based on our discussions yesterday.

We have not discovered anything, any aging that's unique to license renewal at Calvert Cliffs.

DR. MILLER: What does that mean?

MR. DOROSHUK: That means we haven't found --

DR. MILLER: The aging things that you had discovered before you started this process.

MR. DOROSHUK: All the aging that we identified that needed to be managed was already occurring and it did not uniquely change its state or rate or effect at year 40.

DR. BONACA: That's because you haven't got to 40 years of age.

MR. DOROSHUK: It's not to say that there might be emerging issues, but in 1999, our conclusions are such. The current inspection activity on-site, plus some additions, we believe, will more than reasonably assure that aging managed regardless of age of the plant within reasonable cost estimates.

And we think that from Calvert Cliffs' approach, which is a life cycle management approach, by applying these resources over the long-term perspective, we have been able to plan for long-term safety and reliability.

We have done more than what the rule requires. Our program was laid out to manage the life cycle of the plant. We believe that many utilities have strategic engineering assets and resources in place that are doing similar types of evaluations. They may not be in an organization called the life cycle management project.

So I don't want to leave you with the impression that this is the standard and this is what it should look like. We think that license renewal was a very healthy byproduct of the life cycle approach. License renewal, in and of itself, is a little bit different than what we went through. We went through a complete asset evaluation. We tailored it around Part 54, though.

Next slide. I guess in parting thoughts, is plant aging a certain -- these types of resources are hard to put in place and maintain. For a utility to put 25 people in an organization for over ten years, that's over $35 million is what we've spent on all activities. The license renewal portion of that activity represents about $15 million at this point, but we're still getting bills from the NRC staff for their review. So we think that the appropriate -- if you were just looking at the types of resources it would take to do an application, at this time, given the current state of lessons learned, is around ten to $15 million in resources over a three to four-year period. Just so you have a mark on the wall on what at least our opinion is.

The cost of not doing anything, however, is steep and I think that we have seen some of the unfortunate results, whether it be from an aging or a strategic planning -- plants, some plants have not made 40 years, not necessarily because they didn't have a life cycle management group.

DR. FONTANA: That's where I was going to ask a question there. What are some of the costs of no action and how -- you probably can't answer the second part of the question -- what was it that drove some other utilities to go to an opposite conclusion and shut their plants down rather than extend the lifetime, as compared to the decision

that you all made?

MR. DOROSHUK: Some of the early plants that shut down were voted to be shut down by a referendum and the utilities were reimbursed through the rates, and so there were incentives and there were agreements made.

So I can't -- but I can't comment on whether a regulatory-driven recovery program or some of the other, you know, news stories we hear on some of the plants that recently have shut down.

I can tell you, with respect to Calvert Cliffs, that we certainly look very hard at the early shutdown scenario and we studied it. In fact, we were directed to take off our license renewal hats and stop thinking about the long run. Management said don't be in love with your project, go look at the right thing to do, and if the right thing to do is to shut the plant down, then let's shut the plant down in the most responsible manner.

So we didn't go through these last ten years without that type of consideration. We looked very hard at it.

DR. BONACA: With this decision in place, even if you get the license renewal, you still can shut the plant down anytime you want.

MR. DOROSHUK: That's exactly right, and I said in the beginning, it is an option. If we can't continue to meet the safety goals and compete, then license renewal and steam generator replacement and all of this was -- it still didn't get us there.

DR. MILLER: This is a question that may be more difficult to answer. You've spent 35 million over the last ten years. If there had been a strategic life cycle management program put in place at the time you designed the plant, like pay me now or pay me a lot later, would this cost, integrated over 60 years, have been somewhat less?

MR. DOROSHUK: I guess it would be. I mean, we started virtually in 1985 when the plant was ten years old. So we actually put the formal organization. We've had some -- we work costs. We had rule change. So we had to throw out all that active work we did and so we had some work that we would not like to see another utility repeat.

But certainly, with the work that NEI is doing with EPRI and the technology transfer, it doesn't do Calvert Cliffs any good to be the only plant that renews its license, because the industry and the NRC will all hang up the signs and go home.

We need to move ahead as -- even in a deregulated market, continuing to share what we think are unique types of resources and insights. So we hope it gets cheaper. It should.

Thank you, sir.

DR. FONTANA: You're setting precedence and the question that comes to mind is that you set this precedent, which is totally based on today's philosophy. In your mind, do you think that will inhibit the development of maybe more efficient approaches which may be more risk-based?

MR. DOROSHUK: Not at all. No. In fact, we've identified a number of lessons learned already; not from the perspective of changing the way you scope license renewal, but we're continuing to bring back what people shouldn't do to the industry organizations to transfer that.

You won't be able to tell until you actually look at plant

number eight, I pull that -- that's just arbitrary -- one through five, the standardization isn't there, the rule improvements or the process improvements are still in the consideration stage.

DR. SEALE: Well, you guys have bitten a few bullets in the past. The environmental protection --

MR. DOROSHUK: Starting from day one, right?

DR. SEALE: -- was a hard way to get your -- to tie your running shoes on and it's interesting.

MR. GRIMES: I do think that it's important to at least point, we're cutting them some slack on the fees. We split our time.

DR. MILLER: He didn't mention that. It appears like the process you have put in place is certainly generic and not unique to, say, a CE-type plant. What fraction do you think is unique to the CE-type plant or is it mostly generic, that Westinghouse or GE or whatever could pick up and --

MR. DOROSHUK: It's not until you get way into the internals of the plant, reactor internals is a good example. CE's got their own issues, Westinghouse has got some of their own issues.

We solved one yesterday for the CE fleet, in the fatigue area, with NRR, based on the Calvert Cliffs work, at least we think we did. So there are -- it's not until you really get into the analytical sides and the vendor-unique construction that you find the aging effects.

MR. GRIMES: I'd like to add that to the extent that this at least heads in the direction of more of a performance-based review, I don't think that you're going to see as much of a variation from plant to plant as you're going to see from utility to utility and the way that they implement their chemistry programs or their maintenance programs.

At this point, I'm encouraging utilities to look across their common aging management programs as ways to achieve efficiencies, as opposed to -- obviously, the boiling water reactors all have a common theme running with vessel internals, but in terms of IGSCC, you find it more as program-driven than it is plant design, at least in terms of the way that we've organized the review, looking at managing aging effects.

That's why I envision a blend of the system approach that Calvert Cliffs used to present their application and the program approach and tomorrow when the staff talks about how it reviewed the thing, you're going to see that we've go teams of people that cover that.

DR. MILLER: So having, in a sense, Calvert Cliffs, then followed by Oconee, we change to a different approach. It's going to be an exercise in kind of the spectrum of approaches.

MR. GRIMES: That is correct.

DR. BONACA: I have a question. This kind of approach clearly presumes that aging can be and will be managed and I think we see good programs and et cetera.

I have a question for the NRC. Some of the aging effects are not going to be managed. For example, the vessel is a good example. Nobody -- I don't think you'll replace the vessel whenever you get to the limit. So you simply reduce the margin you have on the vessel to a still acceptable level, but there is some going into margins as you --

whoever this margin belonged to, as you go into extended life.

Is the NRC considering any assessment of a large number of plants moving into life extension? And that's really where I would see some risk information being useful to understand implications of a large fleet of plants moving into extended life.

MR. GRIMES: Yes. We are planning on -- from the standpoint of what could the future workload be, we're planning from the standpoint of most of the plants will want to renew their licenses and it's a matter of whether or not they'll all come in in a very narrow time or not.

But I would contend that we're approaching even vessel life as an aging management issue because we're looking at it from the standpoint of how does one monitor the fluents conditions, how does one manage the program.

Last week, I heard a conceptual proposal on how the vessel could be replaced in plants and that's being considered now, at least in some foreign countries.

So we're looking at this from a process perspective and if a plant wants to run its vessel with increasing reductions in power in order to stay within their PTS limits, that's certainly a management approach, but we see it as a viable -- from the standpoint of concentrating on managing aging effects and making sure that the programs are there, then it's a matter of improving the efficiencies and shifting as much emphasis onto performance-based regulatory requirements as is achievable.

MR. DOROSHUK: I'd like to add something to that, Chris. One thing that I think you said was very important, when you talked about pressurized thermal shock. You didn't say that the rule was going to be changed to allow utilities to operate beyond what was already proved. The standards of regulation and safety regulation have not been changed.

The programs and the findings you see here have not eaten into any of the safety margins that have been established. All the acceptance criteria is geared at taking corrective action before any safety margin is exceeded. So there is no decrease.

DR. BONACA: Yes. But the vessel is going to be 60 years old rather than 20 years old. I'm trying to say there is a regulatory margin and there is an actual margin in the equipment, and I'm not trying to -- I'm only -- I was asking more a question of use of risk-based insights in looking at issues of that nature from a regulatory standpoint to see where we simply direct more focus on those programs than Mr. Grimes was talking about.

I recognize that you're not proposing to exceed the criteria that were set by regulation on the margin. I'm only saying that you have an older vessel, so you have less margin just technically in the vessel.

DR. MILLER: In the area of vessels, though, in a sense, aging management started a number of years ago, when they started looking at reducing flux and so forth, and, in a sense, whenever the PTS rule and issue came up, we started managing some of the vessels' ages 15 or so years ago.

MR. GRIMES: I'd also like to reiterate a point, and I think a very important point that Dr. Fontana raised before, and that was that we're trying to get out of our silo thinking and our compartmental approach to the regulatory requirements and we're looking at risk-informing the regulations.

Well, it's starting with risk-informing ISI and I don't see that there is any boundary by which that can't naturally extend all the way out into managing vessel risk. It's a matter of time and experience and more learning.

So to that extent, I see license renewal and aging management and the principal of carrying over the current licensing basis and managing it in the future will become more risk-informed and will continue to be a learning process.

DR. FONTANA: Any additional comments from the committee and the staff? In particular, is there anything that we want to hear tomorrow that we should know about today? You're through with your presentation?

MR. DOROSHUK: Yes, sir. Thank you.

DR. FONTANA: I want to thank you very much. You've been standing there for a couple hours. It turns out you make a good focus that we can talk to.

MR. DOROSHUK: I stayed right here, in between. Thank you.

DR. FONTANA: Any comments from the audience?

[No response.]

DR. FONTANA: The committee? Nothing in addition to what we've already discussed?

[No response.]

DR. FONTANA: Well, thank you very much then. We'll meet tomorrow. Noel suggested, again, are there any specific items that the committee wants to have discussed tomorrow, over and above what's already on the agenda? Are there any specific items that the committee would like to hear about tomorrow that the staff should know about today, particularly in addition to what's on the agenda?

[No response.]

DR. FONTANA: Hearing none, it looks pretty good to me. Well, thank you very much. We'll meet tomorrow at 8:30.

[Whereupon, at 4:06 p.m., the meeting was recessed, to reconvene at 8:30 a.m., Thursday, April 29, 1999.]