MS. FRANOVICH: It really is -- it's a hybrid.

CHAIRMAN BONACA: A couple of questions I have on this. One is, on the thimble tube inspection program, you do have that bottom-mounted instrumentation program, and I don't remember the frequency of inspections on that one. Five years, I think. Is it five years? I think it's five years. Well, anyway, when I was reading it, it speaks about the fact that there is a program right now, that there is a Westinghouse-recommended program, that leaves those thimble tubes in service with up to 80 percent wear, and I was surprised. I mean, is it a typo? Is it correct? Twenty percent residual thickness is sufficient?

MR. MEDOFF: That's correct.

CHAIRMAN BONACA: Okay. I thought it was a typo, maybe, but it's not.

MEMBER POWERS: You were just hoping that it was.

MR. MEDOFF: I would have to check.

CHAIRMAN BONACA: That is robust.

MS. FRANOVICH: Mary, can you help us with the answer to his first question on the frequency of this AMP?

MS. HAZELTINE: The frequency for this AMP is based -- what they do is, when they do the inspection, there is a calculation that they go through in order to determine how long they can operate until they need to do the next inspection, so the frequency is actually based on inspection results that we see.

CHAIRMAN BONACA: Okay. What has been the experience with the thimble tubes at McGuire and Catawba? Do you have any replacement of these thimble tubes?

MS. HAZELTINE: No, there has not been replacement, and I think what they see is, as they operate they degrade to a certain point, and then the degradation stops, which I guess you would expect with a vibration-type wear. We have a few thimble tubes plugged at each site. I couldn't specifically call them out, but some are plugged due to wear, and some are plugged due to other things. I think they got something stuck in one of them when they were doing an inspection, that type of thing.

CHAIRMAN BONACA: So the strategy is to plug them as long as you can. I mean, I'm sure you have a limit to how many you can plug.

MS. HAZELTINE: Yes. There's a tech spec

limit, I believe.

CHAIRMAN BONACA: Yeah.

MEMBER ROSEN: But isn't it true that those thimbles can be replaced?

MS. HAZELTINE: I believe that they can be replaced, and that they have actually been replaced at some other units, but we currently are not looking at doing that at McGuire and Catawba.

MEMBER ROSEN: But strictly speaking then, if they're replaceable, then they shouldn't be the subject of --

MS. FRANOVICH: But the applicant would have to demonstrate that they plan to replace them. If they don't plan to replace them on a specified life or based on performance, or condition monitoring, then they're within the scope of license renewal, and subject to an Aging Management Review.

CHAIRMAN BONACA: The other question I had was relating to an open item that you had, and maybe have closed. The one about V.C. Summers, Lessons Learned, implementation of those. Have you received closure on that?

MS. FRANOVICH: Yes, we have. What we asked for in the SER was the weld material in their reactor coolant system piping. We were looking for

the locations that contain 82/182 weld material, and we also wanted them to tell us what efforts, or what actions they have taken in response to the industry operating experience of V.C. Summers. They provided four locations that have the Alloy 82/182 material. They reference the pages of the application, Aging Management Review results table, that those locations are specified in. And in those locations, they credit the Alloy 600 Aging Management Review, and several other Aging Management Programs, I believe the ISI Plan. And they indicated what industry initiatives Duke is participating in, and that was sufficient for the Staff to consider this item closed.

I indicated earlier this morning that the Staff considers this a current operating issue, and because field welds were part of the root cause of this event at V.C. Summers, and the Sherron Harris Plant is the only other plant known to the Staff to have field welds, then the Staff has confidence that the Aging Management of these weld locations for McGuire and Catawba are adequate.

CHAIRMAN BONACA: My concern was more, as I had pressed at a previous -- at another meeting, more about -- and we discussed this down at Region 2. They expressed the same concern about the fact that

the previous inspections, the in-service inspections don't identify any indication of cracking in these welds. And yet, after they had this through-wall leak, then they went back and they found that they, in fact, had cracks in all the other nozzles.

MS. FRANOVICH: Right.

CHAIRMAN BONACA: Which says, you know, it's a failure of the inspection system. So now that was attributed possibly to the roughness in those locations, and the fact that, I guess the small tray that is moved over with a probe may have missed contact, and so on and so forth. But that raises the question about what is the industry going to do with future inspection? If those are the lessons learned, how are they being applied in such a way that we're going to see cracks now through volumetric inspection, rather than just simply waiting for a leak to come through.

MR. BATEMAN: This is Bill Bateman of the Staff. Industry was very sensitive to that Summer event, and subsequent to then, they've improved their NDE techniques. They've gone to smaller-diameter transducers, which would have a tendency to help overcome the roughness issue. And they've also employed eddy current techniques, so they've got

improved inspection. They've made significant improvements to their inspection techniques in an attempt to eliminate the possibility that they'll miss a crack like that.

CHAIRMAN BONACA: So the eddy current, for example, now it's routinely done?

MR. BATEMAN: The eddy current now is on the inspection devices, and that would pick up any surface flaws.

CHAIRMAN BONACA: Okay. Thank you. All right. That's good to know. I mean, we asked the question before, and we didn't get an answer, so thank you.

MEMBER LEITCH: I'm sorry. Does that answer apply to V.C. Summer, or is that all --

MR. BATEMAN: Well, that didn't apply to V.C. Summer before.

MEMBER LEITCH: No, but it does now. Right?

MR. BATEMAN: Well, I don't even think they inspected that weld this last outage. They didn't have a -- with the new weld, I don't think they had any requirement to inspect a new weld.

CHAIRMAN BONACA: But they have committed to inspecting the other nozzles, however, every

outage. So I would expect that --

MR. BATEMAN: That's my understanding, that they've improved the inspection techniques to smaller transducers and eddy current devices. If the licensees know something different, in terms of their inspection experience, that might be useful. Is that consistent with what you folks do?

MS. HAZELTINE: I can't add anything to that.

MR. BATEMAN: Okay. Well, that's what we were told by industry in a number of different forums, that that's what they've done. Because certainly, we were very concerned about what improvements they were going to make in subsequent inspections at all plants to be sure this was not going to happen again.

MEMBER LEITCH: Okay. Thanks.

MR. MEDOFF: The RCS-specific AMPs are -- there's a new one. The pressurizer spray head that Rani briefly touched on before, this is a one-time inspection program. Basically determined that cracking is not an issue with the pressurizer spray heads. They were brought into the scope of license-renewal because the FSAR credits the spray heads with pressure control, and cooling temperature control following a fire event.

They have the typical reactor vessel integrity program. I would like to defer any questions on this a little bit, if you have any, a little bit later, when I will discuss the time limiting aging analyses for the vessel because they're inter-related. There's the CRDM and other vessel closure penetration inspection program, and I can't emphasize this program enough.

What I really want to emphasize to you is that the current licensing basis for this program keeps changing yearly up to now. There have been previous cracking events at Oconee and Arkansas, as well as the extremely significant cracking event at Davis-Besse. The Staff included the review of all pertinent generic communications issued on CRDM and vessel head penetration nozzle cracking as part of its review of this program.

We did leave an open item on the program due to the fact that we issued a bulletin in April that really was brought to light, the question of whether current industry practices for inspecting vessel head penetration nozzles are adequate at this point. The licensee has come back with a draft resolution of this issue. Basically, they are committing to implementing their program as described

in the response to Bulletin 2002-02, as their means of addressing this issue as it relates to the McGuire and Catawba application.

At this point, it's a confirmatory item. When they send it in, we'll look it over and make sure that it's all okay.

CHAIRMAN BONACA: I was confused a little reading the program here, and Appendix B, there's a B.3.9-2. It says, "For McGuire this new inspection would be completed following issuance of the new operating licenses." What is this new inspection?

MR. MEDOFF: Where are you now?

CHAIRMAN BONACA: I'm reading the program on the application.

MR. MEDOFF: The CRDM program?

CHAIRMAN BONACA: It's page B.3.9-2. And it refers to this new inspection, and I was confused about what new inspection is this? I thought that McGuire would be following that curve and performing the CRDM inspections when the time comes. This implies that there is an additional inspection being done?

MS. HAZELTINE: At the time we submitted our license-renewal application, the CRDM nozzle inspection program was a new inspection. As Jim has

indicated, the state of the industry, things have continually changed, so we have things going on right now as part of our current licensing basis, that we've been required to do. Some of those things happened after we presented the --

CHAIRMAN BONACA: I understand. So this inspection is not a new inspection. It now has become the inspection that you will perform as part of the program, as the industry recommends.

MS. HAZELTINE: Right. Things have changed since we submitted our application.

CHAIRMAN BONACA: I understand. I just was reading it, and tried to figure out what is this new inspection.

MR. GILL: This is Bob Gill. Our latest response to Bulletin 2002-02 indicated we'd provide our formal plans on the McGuire and Catawba vessels within four years. They are very low susceptibility vessels. I think the written response we're going to put in reiterates those commitments in there.

We went through this thoroughly with the regional inspectors on site, and brought down our experts, and liken it to, you know, the COB is the COB today, but at year 40 there's a step change in what we're doing. And I think part of this submittal, we

were aware of the recent history just prior to, and I think something had happened in like April of '01, just prior to us making the submittal, and we put some paragraphs alluding to that operating experience. We knew something was going to happen. We just didn't know what. But since that time, we had 2001-01 as a Bulletin, and two 2002 bulletins on the same topic, so at least three bulletins now since this submittal that will now step-change the Part 50 commitments in that area, and will most likely equal what we've already committed to for license-renewal, but just bring it forward doing something in the current term.

CHAIRMAN BONACA: I understand. It's just the way this read is -- I thought that you would commit to an additional inspection, and I was surprised that you would do that.

MR. GILL: Yeah. Well, we had identified as an aging affect.

CHAIRMAN BONACA: Okay.

MR. GILL: And actually, Oconee has very similar programs, so we knew we had to do something.

CHAIRMAN BONACA: Thank you.

MR. MEDOFF: Moving on --

MEMBER LEITCH: Are these plants low susceptibility because they're relatively new, or are

they in the so-called cold head?

MS. HAZELTINE: It's the cold head.

MEMBER LEITCH: The cold head.

MR. MEDOFF: Moving on, we briefly touched on the BMI thimble tube inspection program. There's another new program, the RV Internals Program. I'm prepared to discuss any questions you have with that, as well as steam generator surveillance program. And John will address any questions you have with respect to that.

We had five open items. The applicant has provided us with draft resolutions of these items. They all appear to be acceptable at this point. They haven't been formally submitted, but given what they've proposed to us, we have turned these into confirmatory items, based on their advanced notice to us.

MS. FRANOVICH: And when we met with the Staff in September, they provided hand-outs for the meeting that contained proposed responses to the open items, so based upon those proposed responses, these are confirmatory items.

MR. MEDOFF: I'll briefly touch on these five confirmatory items. The first one, really the issue is whether VT-3 exams proposed for the one-time

inspection of the McGuire pressurizer spray head would be adequate to detect cracking in the spray heads, and the Staff considers that VT-1s are actually the appropriate visual examinations. And the applicant has provided the draft resolution, is that they will change that to VT-1s.

In terms of the reactor vessel integrity surveillance program, there were some questions whether the capsules proposed for the extended periods of operation would provide relevant data for the vessels as applicable for the extended period. You don't want to amass so much fluence that it's not going to provide relevant data, nor do you want to have too little fluence, so you have -- when you're irradiating the surveillance capsules in the vessel, there's a certain fluence criteria that we use, where we would consider the data when the capsules are tested, to consider them to provide relevant data. So we had a couple of questions on that, and they're going to provide an updated schedule consistent with the Staff's questions.

I just briefly touched on the vessel head nozzle inspection program. Basically, they're going to commit to their program as referenced in the response to Bulletin 2002-02. We asked a question on

the reactor vessel internals. This really was a three part question, but the main issue was whether inspecting the baffle forgings and welds, the baffle plates and welds would provide a sufficient basis for scheduling examinations of the remaining three units.

When we had our discussions with the applicant in September, they pointed out some differences in the RV internal designs. The applicant has preferred one additional unit for these inspections, McGuire 2, and based on the differences in designs, we think that the inspections at McGuire 1 and 2, as well as previous inspections at all three Oconee units should provide relevant data as to whether they need to schedule further inspections at Catawba 1 and 2.

MS. FRANOVICH: And the applicant, as I indicated earlier this morning, proposed to perform those inspections on a staggered basis, one around year 40, and the other around year 50.

MR. MEDOFF: And the final open item was really an SR supplement issue with regard to the steam generator surveillance program, and I'll let John touch on that one a little bit.

MR. TSAO: Basically, this program, the applicant's steam generator surveillance program

committed to NEI Directive 97-06, but in their SR supplement they forgot to mention the NEI 97-06, so we requested the applicant to include that. And basically, this is a documentation issue. And the applicant is going to commit to that.

MS. FRANOVICH: That concludes the Staff's presentation on Section 3.1, unless there are any questions we can address at this time.

MEMBER FORD: The one thing I couldn't find, and I'm sure it's there, is a question of cracking of the baffle bolts.

MR. MEDOFF: Yes. We --

MEMBER FORD: I couldn't find it. I'm sure it's there. It must be there.

MR. MEDOFF: Yes. We address baffle bolt. It's in our review of the reactor vessel internals Aging Management Program.

MEMBER FORD: Okay.

MR. MEDOFF: Basically, what -- bear with me, Dr. Ford.

MEMBER FORD: Well, I found it. It's one piece further on, 3.145.

MR. MEDOFF: There should be a table associated with that page.

MEMBER FORD: Yeah, 3.145. Okay.

MR. MEDOFF: Basically, another review of that. They were going to use the Oconee 1 and the McGuire 1 exams as a basis for whether they need to schedule further examinations at Catawba 1 and 2 and McGuire Unit 2.

MEMBER FORD: I notice in this particular area, you don't take into account the extensive French experience of cracking of these components. Is there a reason for that, why our industry doesn't take into account a lot of experience in 58 whatever it is, PWRs in France?

MR. MEDOFF: Well, this is definitely my fault, and I should have been aware of it before, but this is the first I've heard about the French data, because this is the first time I've done RCS.

MEMBER FORD: Okay.

MS. FRANOVICH: Do you think it's worthwhile for the Staff to go back and take a look?

MEMBER FORD: No, I don't think there's a fault. I'm just looking through depth, as to whether you're looking in other places rather than just the United States.

MS. FRANOVICH: Domestic operating experience. Right.

MR. HISER: This is Allen Hiser of EMCB.

U.S. plants have done some inspections on baffle bolts, and the cracking so far has been found not to be too significant. And the industry does have a continuing program to address baffle bolts and all of the internals, and that's what's integrated within the license-renewal programs at Calvert Cliffs, Oconee, and all the PWRs. So there are ongoing efforts in that area, and I would assume that's integrated, those results would be integrated with the Catawba/McGuire internals inspection program. So we are very much -- that data very much is incorporated within the review of this.

MEMBER LEITCH: On page 3-146 of the SER, right below the middle of the page, I don't mean to make a thing about typos, but I'm not sure if it's a typo or my lack of understanding. It speaks about inspecting the internals on McGuire 1 and Catawba 1 and 2, depending upon the results of Catawba 1. I think that McGuire 1 in that line should be McGuire 2, unless my understanding is --

MR. MEDOFF: Right. Right. That is a typo. Thank you.

MS. FRANOVICH: Any other questions for the Staff? Okay. Jim, John, thank you very much.

MR. MEDOFF: Thank you.

MS. FRANOVICH: Okay. The next section that the Staff reviewed is the -- or the next section in the SER is the Aging Management Review results for engineer safety features, which there are eight systems. And these are just a handful of those systems.

The Staff concluded that all aging affects were identified. The aging affects listed were appropriate for the materials and environments listed, and concluded with reasonable assurance that the intended functions will be maintained consistent CLB during the renewal period. There were no open or confirmatory items in this section. Any questions on Section 3.2 of the SER with open items?

Okay. The next section was auxiliary systems, of which there were 38. And these are just the types of auxiliary systems that the Staff reviewed. The Staff identified a number of open items, two of which are now confirmatory. The remaining open item had to do with a condenser circulating water system expansion joint that was brought into the scope of license renewal as a result of a Staff request for additional information.

When the applicant indicated in the REI response that the subject component was within scope,

provided Aging Management Review results, indicating that the component was made of rubber material, and specified no aging affects. The Staff kept the item open because the Staff felt that exposure to UV rays in this component was in the yard, yard environment might cause degradation. The applicant has since informed the Staff that this particular expansion joint is located in a pit some 30 feet below ground level, and it doesn't get much UV exposure. But the Staff still has an intuitive lack of confidence that a rubber expansion joint, a rubber component can last for upwards of 60 years. So pending further Staff review and information from the applicant that indicates exactly what this rubber material is, and why it's good for 60 years, this item remains open.

MEMBER POWERS: Is it exposed to any oxidizing material like sulfur dioxide, nitrous oxide, hydrogen peroxide?

MS. FRANOVICH: To my knowledge it is not. It's in a pit that's out in the yard beside the turbine building at Catawba. There are some motors, some circ water motors that are in this pit.

MEMBER POWERS: That's enough.

MS. FRANOVICH: So then perhaps that environment would be conducive to aging.

MEMBER POWERS: Any vigorous oxidant like ozone, any of the nitrous oxides, nitric oxide, and nitrogen dioxide, any hydrogen peroxide, all of which are found in combustion motor exhausts or the atmosphere coming off electrical motors will attack rubber, and cause it to cross-link, thereby embrittling it.

MS. FRANOVICH: And my understanding is that these pump motors are electric, but you say that the same --

MEMBER POWERS: That's enough.

MS. FRANOVICH: Okay. Thank you, Dr. Powers.

CHAIRMAN BONACA: There was some experience at both Catawba and McGuire about the nitrate induced stress corrosion of Carbon Steel in the component cooling system. That was repaired. Right? And did you have any monitoring, that kind of experience there?

MR. ROBINSON: This is not related to the expansion joints though.

CHAIRMAN BONACA: No.

MR. ROBINSON: Okay.

CHAIRMAN BONACA: I was talking about part of the systems, I believe the --

MR. ROBINSON: I think I'm still confused.

MS. FRANOVICH: I think Dr. Bonaca is asking about some operating experience that was listed in the application pertaining to nitrate induced stress corrosion cracking of component cooling water systems.

CHAIRMAN BONACA: Right.

MS. FRANOVICH: And I seem to remember a little bit about that from when I was there. I don't know if it had to do with some biocide that they were testing out, but that's a better question for Duke to field.

MR. SEMMLER: In their closed cooling water system they use a corrosion inhibitor, and the chemistry program was maintaining the corrosion inhibitor at the upper-end of the recommended range by the vendor. We started to have some cracking in the crevices, in the welds, and in the closed cooling water system. And in contact with the vendor, and research in metallurgy analysis of some of the cracking, they recommended that we maintain the corrosion inhibitor in the lower to mid-range of the recommendation. And chemistry folks made the changes and have not had any problems with cracking of that nature any more.

MS. FRANOVICH: What was the vintage of that problem, Mike? Was that in the 80s?

MR. SEMMLER: Mid-90s.

MS. FRANOVICH: Mid-90s.

MR. SEMMLER: Yeah. It's been five or six years since they've done that, and we haven't had any more problems.

MS. FRANOVICH: Okay. Thank you, Mike.

MR. SEMMLER: Thank you.

MS. FRANOVICH: Any other questions on the open item, or the two confirmatory items in Section 3.3? Okay. We'll go on to 3.4.

The Staff concluded that there was one open item pertaining to one-time inspection of auxiliary feed-water system. This open item also applies to main feed-water, although we did not explicitly state that in the SER with open items.

What the applicant relies on to manage the loss of material of its secondary systems auxiliary feed-water and main feed-water, in particular, is they credit their chemistry control program. And it has been the Staff's position that chemistry control programs should be -- let me put it this way. An inspection of the systems that credit this program should have a one-time inspection to verify the

effectiveness of the chemistry control programs.

When we met with Duke in September, they indicated that they often go into the condenser and the look at the material condition of the components exposed to feed-water, and indicated that they have not seen loss of material as an aging affect in these components.

The Staff clarified that what it really needs is a deliberate procedure to actually seek out those aging affects, and document evidence indicating that they are not present, so Duke has gone back to evaluate what they would like to propose to resolve this open item. And this open item is indicative of how the Staff has treated this particular one-time inspection for previous applicants.

MEMBER LEITCH: Did you say that that inspection would be done in the condenser?

MS. FRANOVICH: No. Actually, we didn't specify where the inspection needed to be, although we did indicate that the results of the inspection should be generalizable to not only the auxiliary feed-water system, which has the open item, but also the main feed-water system.

MEMBER LEITCH: Yeah. I would generally not think that the condenser would be a good place to

do inspections.

MS. FRANOVICH: Any other questions on Section 3.4? Okay. Section 3.5, containments, structures, and component supports. The Staff identified three open items. One of those open items has been resolved, and that's the open item 3.5-2, which addresses the environment for below-grade concrete. And the applicant indicated and provided data to the Staff, indicating that their groundwater is not aggressive. They relied on 20 years of operating experience and data collection to come to that conclusion. And the Staff found that that position was acceptable, that operating experience was acceptable.

At this time, I'd like to ask David Jeng to come up and present the open items on the remaining -- two SER open items that have not been resolved. David Jeng was the Lead Reviewer on the Staff for review of the license-renewal application Section 3.5. David.

MR. JENG: Good afternoon. My name is David Jeng. I am a member of the Mechanical and Civil Engineering Branch. As Rani said, we have two open items. The first one is regarding the concrete elements in the accessible above-grades aging

management issue. The applicant indicated that only those elements which are exposed to harsh or abrasive environments needs to be managed. Whereas, our ISG on concrete management position calls for all in-scope concrete need to be at least periodically inspected. And this is where we differ with the applicant.

However, on September 18th, we had a good communication with the applicant, and I guess the indication is that response will be forthcoming from the applicant to try to resolve this issue.

The second item pertain to the aging management of the concrete component in the ice condenser systems. There are three concrete elements within the ice condenser. One is the wear shroud, the second is the structure of concrete supporting that shroud, and the third one is the outer ring support wall, concrete which are normally inaccessible because of the insulation panel is placed upon the surface of those concrete.

Again, the Staff is concerned that these elements needs to be somehow managed. The applicant also had a good discussion with us on September 18th, and there's a good understanding of how the issue could be mutually resolved. Again, we are awaiting the applicant's response on this second item.

MS. FRANOVICH: Let me clarify. The applicant actually did submit interim responses to our open items, these two open items. The Staff is currently reviewing those responses to ensure that they will adequately resolve these items, so the ball is in the Staff's court at this point. Any questions for Mr. Jeng?

MEMBER POWERS: When you think about below-grade concrete and its exposure to the water, groundwater.

MR. JENG: Yes.

MEMBER POWERS: Do you think in terms of sulfate attack, or phosphate attack, or is it all carbon dioxide attack?

MR. JENG: Yes. As a matter of fact, the Staff has established a position of defining what would constitute aggressive elements which would form the concern. Three criteria. One is the pH value, and the way that you see the pH value is to stay about 5.5. Second is the fluoride content, which we maintain should no exceed 500 PPM. And the third is the one you mentioned, sulfate attack, and we are maintaining should not exceed 1,500 PPM. So the applicant in this particular case will submit their long duration testing data which has shown the datas

way below these rates.

MEMBER POWERS: Do you not include phosphate in there?

MR. JENG: Yes. Phosphate should not exceed 1,500 PPM.

MEMBER POWERS: Okay. And sulfate is also 1,500 PPM.

MR. JENG: No, Chloride.

MEMBER POWERS: Chloride.

MR. JENG: Yeah, 500 PPM.

MEMBER POWERS: Sulfate is not an attacker?

MR. JENG: The Staff set the -- actually, these are the number recommended by the expert on that technology, and they recommended that these three items should be the basis for concern, what would be considered to be aggressive, and what non-aggressive environments.

MEMBER POWERS: I've certainly seen sulfates attack concrete surfaces. Phosphate, I have no experience with Chloride attack on concrete.

MR. JENG: Well, I'm talking on Sulfate. I'm sorry. It's 1,500 PPM Sulfates.

MS. FRANOVICH: Tim, if I can have the projector paused, we've got a slide of some of the

data and parameters that we used to evaluate this issue.

MEMBER ROSEN: While you're having that slide put up, let me ask you a question about drawing a conclusion that the sub-surface concrete structures are protected because the environment meets your criteria, based on sampling of that sub-surface environment now. Is there any guidance offered by the Staff to the applicant, or requirements in terms of continuing to check the sub-surface environment in the future? We're talking about a long term here. Is there any likelihood that the sub-surface environment might shift in some way, and put it in a condition which might affect the structures in the future?

MS. FRANOVICH: That's a really good question, and the Staff asked that same question. And what the applicant replied to the Staff was that their water contour tables indicate that any change in the groundwater on-site would result from an event on site, a chemical spill of some sort on-site, so they didn't really have to worry about things happening off-site that could affect the groundwater environment on-site. And we looked at some water contour maps in the original licensing environmental report, and confirmed that what they were telling us was true. So

the Staff felt that their operating experience indicates that the groundwater is non-aggressive. It's not likely to change in the period of extended operation. And for the Staff to hypothesize an event on-site that would cause the groundwater to change, would be hypothetical, which is not reasonable.

MEMBER ROSEN: Well, I'm not thinking about it based on an event that happens on-site, because clearly, Duke would know about a major, say Sodium Hydrochloride, is they used it, spill or something like that. And I'm just thinking that over time, we're talking about fairly long term times here, over time maybe some activities off-site, maybe, you know, there's a lot of development going on, things shift in the environment. And it seems to me it would be prudent to have some requirement to confirm, not every day, not every month, not even maybe every year to take a groundwater sample and confirm that the original conditions are still pertinent.

MS. FRANOVICH: Yeah. I understand your concern, and I believe that the applicant does perform groundwater monitoring, and will continue in the period of extended operation. But they don't credit that for license-renewal, because they have established that the groundwater is not aggressive.

MEMBER ROSEN: Today.

MS. FRANOVICH: Today. And they've also established that it's not likely to change in the future. It does seem speculative, it does. I agree with you, but at the same time, the Staff doesn't have a basis for --

MEMBER ROSEN: Well, my basis, I don't know what the Staff's basis is. My basis is the sampling of groundwater ought to be fairly cheap and simple, and it is a major criteria for concluding that important safety-related structures are not going to be degraded underground.

MS. FRANOVICH: I agree with you, but this is an issue that Duke has challenged the Staff on, on principle.

MEMBER POWERS: The magnitude of affect would have to be fairly dramatic.

MR. JENG: Some additional comment. The matter is very stable. You know, the core -- some specific impact, you have to put erosion, vibrations, and we believe that it should be very --

MEMBER ROSEN: Well, then there should be no problem taking the sample and proving it.

MS. FRANOVICH: I understand, and I don't disagree with you.

MR. JENG: Dr. Rosen, we will take that into consideration.

MS. FRANOVICH: I don't know if Duke would like to comment on that. I guess not. David, do you want to talk about the data and parameters on this slide?

MR. JENG: Yeah. The one section here are based on Duke's input. As you can tell, these are based on many, many years of on-site testing. The bottom column, I call your attention, these are the acceptance limits for the pH, and the Chloride, and the Sulfate. As you can see, the main ones shown are underlined on different occasions on different sites, and they are way, way below the 500 and 1,500 limits we have shown, so this is the basis upon which the Staff resolved --

MEMBER POWERS: You don't have a limit for Phosphate.

MR. JENG: No.

MEMBER POWERS: You know, it might be worthwhile just to find out. I mean, there are very few sites in the United States where you have a high Phosphate content, Texas being a notable exception. But I've seen Phosphates attack concrete. It's the same mechanism as the Sulfate. You turn Calcium

Hydroxide into Calcium Phosphate, and that solubilizes it, and whatnot. Your pH control keeps your CO2 levels down reasonable, and whatnot.

MR. JENG: I think I should make one point. Based on the Staff many years of experience on the concrete performance, its quality, and the way we enforce certain criteria, HEI-318, HEI-201, all these documents which control the action, emission, design and the installation reaction and control.

MEMBER POWERS: Everybody in America uses those same criteria.

MR. JENG: But this is not so. Concrete is very durable --

MEMBER POWERS: It's worth looking at to see, but I mean, I bet they're not a half a dozen sites that have very much Phosphate in them. It will surprise you when it occurs.

MEMBER FORD: I'm going to show my ignorance. What are the material properties for the reinforced concrete to which these acceptance limits apply, fragility, corrosion of the rebar?

MEMBER POWERS: Decrepitation.

MEMBER FORD: Decrepitation.

MR. JENG: This is mostly concrete which is, to some extent, very porous, and they would be

subject to interaction by different Chlorides and Sulfides, and in an acidity environment they tend to, you know, be influenced more than in alkaline environment. And the experience and the tests have shown that if concrete was placed in such aggressive environments over the years, with 100 years experience, they are staying there in tact, strong down in the ground there for 100 years, so we are quite confident these are good criteria.

MEMBER FORD: I seem to remember at Oyster Creek ten, fifteen years ago there was a major corrosion problem of the, in this case the liner, the carbon-steel liner. And I realize it's not pertinent to this particular containment design, but there is rebar presumably in this, and it can corrode. And presumably, that would affect the overall strength, the composite strength.

MEMBER POWERS: You have to get to it first.

MEMBER FORD: I recognize that.

MEMBER POWERS: The decrepitation is how you get to it.

MEMBER FORD: Yeah.

MEMBER POWERS: And all that's happening here is the Chlorides and the Sulfates turn the

Calcium Hydroxide into Calcium Chloride, Calcium Sulfate, and it loses its adherence, and the lock falls out, and then you can get to the rebar. And the rebar will disappear instantly in this kind of environment.

MEMBER FORD: Yeah. Thank you.

MS. FRANOVICH: I just wanted to follow up based upon the comment from Dr. Powers. Would Duke like to add any anecdotal information about the Phosphate levels in the groundwater or the lake water for McGuire and Catawba?

MS. KEISER: I can't give you the exact numbers, but it is tested as part of the groundwater monitoring. And it is similar to the Chloride and Sulfate levels. It is very low compared to the limits.

MS. FRANOVICH: Is that something that we could probably get, the Staff could get, just to confirm, verify, just for our own edification?

MS. KEISER: Yes, if you needed to get that. And I wanted to add about the -- doing the testing and the idea that what we've done may not be adequate in the future to determine the aging affects for the concrete. We had at one in time in our office, the geologists at Duke Power that are familiar

with the groundwater, with the soil around the plants, and they participated with Rani and some of the other NRC Staff that was there on-site, looking at again, the topography, what would affect the groundwater around the site, the soil types and things like that. And the information they have just for that locality, the Piedmont area, there have not been changes over, you know, hundreds of years over the things that are in that groundwater. And so we feel that what we've done is adequate to show that it will not change in the future, unless there is some type of accident on the site. And again, we would be cognizant of anything that happened there. We didn't feel that it was necessary to do any groundwater monitoring for license-renewal.

MEMBER POWERS: You don't have any Calcium Aluminate concretes, do you?

MS. KEISER: No, we do not.

MEMBER FORD: I think the remark Mr. Rosen was making, for instance, relates to, for instance, someone mentioned the two lakes which are supplying separately the two reactor sites. One is, I hesitate to say it, brackish, but it's far less purity than the other. And if there are big housing developments to go up in that area, then it could get even worse. I

think that was what you were talking about, not the 100 year geological time.

MS. KEISER: Right. And when we were showing the topography to the NRC staff, we were showing that that would not -- the way that the water flow would flow from the lake to the site or away from the site, like it would not yield where the water would flow to the site, the topography would not lend it where it would have any off-site affects to the ground water.

MS. FRANOVICH: Thank you. That was Debbie Keiser, Duke Staff. Any other questions on Section 3.5 of the SER? Okay. With that I'd like to ask Paul Shemanski to come to the table. Paul is a seasoned veteran of license-renewal reviews, and --

MEMBER POWERS: That's why his hairline is approaching mine and things like that.

MS. FRANOVICH: I will decline to comment. But I'm going to present the presentation, but I asked Paul to be at the table with me, because this is on the outer edges of my scope of knowledge, so he'll be able to address any questions that you ask that I cannot answer.

Okay. Section 3.6 of the SER with open items documents the Staff's evaluation of Aging

Management Review results provided for electrical and INC. The aging affects fall into three categories. The first is those that are caused by heat and radiation, and this is degradation really of the insulation covering electrical cables.

The Aging Management Program credited by Duke is the non-EQ insulated cables and connections inspection program. Staff currently has an open item with regard to this particular program, this visual inspection proposed by Duke, and its capability of detecting cable insulation degradation that may be very minor, but for certain cables instrumentation the high range radiation and neutron monitoring instrumentation cables, the Staff is concerned that even a slight degraded condition of the insulation could cause an exponential result in the signal that's traveling through these cables. And so in the past, the Staff has found a loop calibration procedure to be acceptable for testing insulation resistance of cables of this nature, so the Staff is currently dialoguing with Duke to determine what an adequate Aging Management Program will be for Duke. But the Staff's concern is really with these two instrumentation cable types.

Staff also has a confirmatory item with

regard to an FSAR supplement change that it expects based on a response to our potential open items letter, whereby the applicant indicated that the potential for moisture in the area of degradation would be considered by their inspection program.

Are there any questions about this open item?

MEMBER LEITCH: Isn't there a -- does this touch on a generic safety issue? I can't remember the number, but --

MR. SHEMANSKI: GSI-168.

MEMBER LEITCH: That's the number. Yeah, right.

MR. SHEMANSKI: No, not really.

MEMBER ROSEN: That's the number, but no, not really.

MR. SHEMANSKI: No. This particular issue deals with the degradation of a specific set of cables, as Rani mentioned. The neutron monitoring or irradiation monitoring cables, they operate typically with very low currents, 10 to the minus 12 amps, and the concern is that if they're exposed to a localized adverse environment from temperature or radiation, a very slight change in the insulation resistance can result because of the degradation of the insulation

from the high temperature or high radiation. And a very small in insulation resistance could affect the instrument loop accuracy readings, basically, in the control room, the LPRMs, APRMs, and so forth. And the question really on this open item deals with which technique is better for monitoring insulation degradation. Staff, I think we have at this point, more confidence in the calibration program. That is a routine program. Typically, it's run about every 18 months in plants. It's part of their normal surveillance program, where they calibrate the instrument loops. And Duke is proposing an alternate method; that is, a visual. They believe by looking at the cables visually, looking for swelling or discoloration, or cracking that that would indicate degradation of the insulation. So we're having this dialogue between us, and trying to sort things out. But I think right now the Staff's position is what is indicated currently in GALL.

This technique was identified in the first application by Calvert Cliffs, and subsequently made its way into GALL, so that is the current Staff position regarding these particular type of cables.

MEMBER LEITCH: So that an unexplained calibration shift then might be perhaps the most

sensitive way of detecting cable degradation.

MR. SHEMANSKI: Well, that's what we feel at this point, that calibration is somewhat more sensitive. We just have a better gut feel for the calibration test at this point. Again, it's done more frequently, every 18 months. And if the calibration goes out of the upper or lower tolerance limits, if you're not able to recalibrate it, you know, to get it back in, then you would do a root cause. And maybe that root cause would lead to identifying the cable as the culprit that is degrading. It could be the sensor, it could be the transmitter, but it gives an opportunity to do a root cause analysis.

And also, it's done, as I mentioned, about every 18 months. Whereas, the visual that Duke is proposing, that would be done at year 40, and at year 50. So it seems like the calibration program, at least, gives you more of an opportunity to detect degradation. But again, we are discussing this. At this point we're not totally ruling out visual, but we're looking for a stronger technical argument that visual can, in fact, detect degradation for these sensitive type of circuits.

MEMBER LEITCH: Okay. Thank you.

MEMBER POWERS: Do we have an experiential

base that something like, since I'm color blind that I would be a terrible inspector, I suspect, for discoloration. How much color change corresponds to how much degradation and resistance?

MR. SHEMANSKI: No, right now that doesn't exist. I mean, when you do a visual inspection on cables, it's kind of a screening type examination. You look for things like cracking, discoloration; that is, typically the cables are dark, you know, black. And when they're exposed to high temperatures they do tend to change colors. They might become brown or white. I mean, you look for swelling, cracking, discoloration, those type of things. And if you find those visual effects, then you would probably want to go ahead and do a more detailed root cause analysis. Right now there are no real criteria that correlate any of those visual anomalies with --

MEMBER POWERS: There must be some basis for them saying gee, we can see.

MR. SHEMANSKI: Well, there is a basis. I think what they're trying to do is extend the bases that are used for power and control cables, where visual actually has been shown to be effective as a condition monitoring technique. But the question the Staff is struggling with now is for these particular

circuits that operate in a very low current range, 10 to the minus 12 amps, is visual really good enough to give you some confidence that you will be able to detect degradation.

The other circuits I mentioned, the power and control cables, if you lose insulation resistance there, it's not such a big deal. But these are very extremely sensitive circuits, and as Rani mentioned, they operate on kind of an electrical exponential curve, and just a small change -- when you're dealing with 10 to the minus 12 amps, you cannot afford very much leakage occurring before you get into trouble, and perhaps get inaccuracies in the instrument loop readings.

But again, if industry can provide us with some additional information regarding visual, you know, we'll buy into it. But at this point, I don't think we've seen enough data or information along those lines to convince us, so we're basically sticking with calibration at this point.

MS. FRANOVICH: And it seems like the frequency is another concern too, the opportunity to identify degradation.

MEMBER LEITCH: To just move briefly into the area of the GSI-168, if we could. That's another

one of these GSIs that's not quite resolved, and how did this deal with that, commit to doing whatever is necessary to support the resolution.

MR. SHEMANSKI: Well, first of all, the applicant did not address the GSI in the application itself. We subsequently issued an RAI, or I forget, a telephone conversation with them. They have to come back, and they made a proposal to us that if we resolve the GSI by November 1st, I believe, then they would be able to address it before the final safety evaluation report has been issued.

We don't have any trouble with their response, but we are certainly not going to have GSI-168 resolved by November 1st. We are working on it.

MEMBER POWERS: Well, you probably will. It's just the year in question.

MR. SHEMANSKI: Right. Basically, on GSI-168 we received the technical assessment from the Office of Research. It has been sent over to NRR, and we are presently developing a draft of the research, technical assessment. We have a draft summary, and we are going to issue it as a generic communication probably within the next several months.

Prior to issuing it, we are going to give the ACRS the opportunity to, whether or not you want

a presentation on the final generic communication prior to sending it out. We have not determined if it's going to be a generic letter, information notice, or a regulatory issue summary, so that is going to be dealt with very shortly.

MEMBER LEITCH: So then that would be handled then on the current licensing basis then?

MR. SHEMANSKI: Yes. Whatever resolution comes out of GSI-168, it will affect all operating reactors across the board. It will become part of their current CLB.

MEMBER LEITCH: Okay. Thank you.

MS. FRANOVICH: Any other questions on this slide? Okay. We'll go onto the next slide. Another aging affect of electrical and I&C equipment is caused by moisture and voltage stress for inaccessible media voltage cables. The aging affect for this is formation of water trees and localized damage. And the Aging Management Program credited by Duke for this aging affect is inaccessible non-EQ medium voltage cables inspection, I'm sorry, Aging Management Program.

The Staff has a confirmatory item on this issue for the applicant to update its SR supplement description of this program to eliminate reference to

significant moisture. And this is a change that resulted from a response to our potential open items letter.

CHAIRMAN BONACA: If I remember, they defined significant moisture as exposure, at least 25 percent of the time.

MS. FRANOVICH: Actually, they characterized it as exposure that lasts three years or more. And the Staff had a lot of questions about this AMP. The AMP is to perform a test every ten years of the cables to ensure that they are not degrading. And the applicant proposed an alternative to that test, to do a visual inspection of the accessible cables, and determine or confirm that there has been no exposure to moisture. If they can confirm that, then they felt that that would be an adequate alternative to the ten year test.

Staff felt that exposure or significant exposure to moisture, being defined as exposure for three years or more, was non-conservative, and so the applicant came back and re-defined their Aging Management Program to eliminate reference to significant exposure to moisture, and to eliminate their alternative of using an inspection program to confirm that there is no moisture in the accessible

cables.

The Staff is currently asking the applicant to provide a little more information that we did not take issue with when we issued the SER with open items pertaining to the proven capabilities of the test that they will use in the period of extended operation. We anticipate that there will be advances made in testing techniques and technologies in the next ten years, or twenty years, and we haven't asked the applicant to specify what test they will use to perform this ten year test, but we would like the applicant to indicate that this will be a proven test. This is language similar to what we've asked for from other applicants. It's language that's found in the GALL report. It's found in some of the previously issues SERs, and we're working with Duke to get that language so that the Staff has confidence that there will at least be a certain caliber test that will be capable of revealing degradation.

CHAIRMAN BONACA: And you're looking also for a more frequent test than ten years?

MS. FRANOVICH: No. I think we're still satisfied with ten years, although the Staff may evaluate the acceptability of that frequency on a generic basis. But for Catawba and McGuire

specifically, the Staff is satisfied with ten years.

MR. SHEMANSKI: Actually, there are two tests, one at year 40, and then one at year 50.

CHAIRMAN BONACA: Yeah, well not for each site.

MS. FRANOVICH: I think for each site.

MR. SHEMANSKI: Yeah. That's how we have it currently described in the GALL, X-E3, I mean IX-E3.

MS. FRANOVICH: Any other questions on this slide? The third and last aging affect that was evaluated by the applicant and reviewed by the Staff, was caused by Boric Acid ingress into connector pins. And the aging affect there is corrosion.

The applicant credits the Aging Management Program of fluid leak management program, which is the program they use to identify any Boric Acid corrosion of structures or components. And there were no open items identified in this section. This is consistent with what applicants have credited in the past, and the Staff finds this acceptable.

CHAIRMAN BONACA: Going back to the previous two issues, one of non-EQ low voltage accessible cable, and the other one, non-accessible cable. What the applicant was proposing is the same

thing they did for Oconee. Right?

MR. SHEMANSKI: Yes.

CHAIRMAN BONACA: You accepted those positions for Oconee.

MR. SHEMANSKI: Yes. The slight difference is that during the Oconee review, the issue of the calibration versus visual for the neutron monitoring and radiation monitoring cables, that did not surface during the Oconee review. Keep in mind, that particular program was identified during the first review of Calvert Cliffs. Calvert Cliffs proposed the calibration Aging Management Program. The main reason we did not focus in on that for the Oconee review was, at that time we were just beginning to develop GALL, the cable Aging Management Programs that are currently in GALL, so we did not focus on -- that is the difference that I would like to point out between the Oconee and the Catawba-McGuire reviews, the calibration program.

(Whereupon, the proceedings went off the record at 3:00 p.m., and resumed at 3:16 p.m.)

CHAIRMAN BONACA: On the record. If everybody is ready, we will start with one minute less.

MS. FRANOVICH: Okay.

CHAIRMAN BONACA: We're anxious to hear about TLAAs.

MS. FRANOVICH: Well, let's not keep you waiting. Chapter 4 of the SER documents the Staff's review of the time-limited aging analyses provided by the Applicant in their application. These TLAAs cover a number of areas, some are listed on this slide and a few more at the top of this slide. We have prepared presentations on the neutron embrittlement, thermal fatigue and underclad cracking, and EQ program.

What I wanted to do before we go to my reviewers to talk about those TLAAs is address the depletion of nuclear service water pond volume due to run-off. This is a TLAA that was asked about earlier in our presentation. For this time-limited aging analysis that I believe applies only to Catawba, the Staff indicated that there was an initial analysis that evaluated available volume of the pond over a 40 year period and loss of that volume due to sedimentation.

They indicated in their TLAA discussion that they have a tech spec surveillance that requires that they ensure that the volume of the pond is monitored by elevation. I believe it's 571 feet is what the water level is required to remain at or above

by tech specs. So the Staff asked a question about what if in the future Duke performs a survey of the bottom of the pond and finds that there is an abundance of sediment at the bottom of the pond.

How would Duke ensure that the volume is still adequate to address all the design basis events that are relied upon or that rely upon this volume of water for plant cool down? The Applicant came back and said that they would either dredge the pond or they would add volume to the pond by increasing the pond size, a number of actions that they could take to ensure that adequate volume is there, but ultimately they have a tech spec surveillance that ensures that they have the minimum allowable volume by elevation in the pond. Are there any questions on that TLAA?

MEMBER LEITCH: But the tech spec surveillance of it just applies to the water level. It doesn't say anything then really about what's below the surface. That's good for the top, but how about the bottom?

MEMBER ROSEN: You have to have it surfaced at this level. You need only one inch of water.

MS. FRANOVICH: Right. I understand the question. In reading this at the SER a couple of days

ago, I also saw that just because you're looking at the elevation doesn't mean that you know what sedimentation activity is going on in the pond. So at this point, let me go out to our reviewer. I believe it was Jai Rajan for a more elaborate discussion of the TLAA. In absence of the reviewer, then perhaps Debbie Keiser of Duke can discuss this TLAA.

PARTICIPANT: Jai is here.

MS. FRANOVICH: Jai, could you please go to the microphone? This is Jai Rajan of the NRC Staff.

MR. RAJAN: The actual reviewer is not here. It was Dr. Pitchumani. I just put together the information that was available.

MS. FRANOVICH: Okay. Was a reviewer assigned to this TLAA after Mr. Pitchumani retired. Kamal?

MR. MANOLY: Yes. This was Kamal Manoly from the Mechanical Branch. Dr. Pitchumani finished the SPOC on the TLAA. There was no open items on it, so there wasn't really any follow up that we needed to do on it.

MS. FRANOVICH: Okay.

MR. MANOLY: We can take the question and get back to you on it.

MS. KEISER: I can address this program. I'm Debbie Keiser from Duke. You are correct. The tech spec is only the top level of the water. It does not ensure the volume of the pond.

What we do is we do soundings of the pond. They go out and do soundings to find the bottom elevation. They do it so often and there are contour elevations that are done of the water in the pond. Then they use a computer program to determine the actual volume using the contour, the elevations in the areas to compute the actual volume of water that's in the pond.

Those contour elevations are in the UFSAR, so what we determine from the soundings that we take is compared to the volumes that is in the UFSAR. There is a limit for the total volume of the pond. That program is what we credit for maintaining the silt. There is a tech spec limit for the top elevation, but what we credit for the silting of the pond is this program where they actually compute the volume of the pond.

MS. FRANOVICH: And that's in the licensed-real application, Debbie.

MS. KEISER: Yes. That's what is described in Section 4.7.3 in the application.

MS. FRANOVICH: Okay, Debbie. Thank you. Sorry we didn't have a good answer for you from the Staff, but thank you, Debbie. Okay. Now I'd like to turn to my reviewers to present the results of their evaluation of the TLAAs: the first one governing neutron embrittlement of the reactor vessel. Jim Medoff was the leader. Jim, do you want to present the results of the Staff's review?

MR. MEDOFF: Hello. This is Jim Medoff again of the Materials and Chemical Engineering Branch of NRR. I was the lead reviewer for reviewing the time-limiting aging analysis for protection of the reaction vessel.

There are typically three TLAAs we looked at for protection of the reactor vessel. The first is a TLAA to protect the reactor vessel against pressurized thermal shock events. The second is to ensure that the reactor vessel materials will have adequate ductility during the extended periods of operation. We typically measure this in terms of the upper shelf energy values which are determined from chart impact test results of the vessel materials. The third is a time-limiting aging analysis on pressure-temperature limits for the reactor vessel. That's really one that relates to operation of the

reactor during its license periods.

Let me start off with the pressure-temperature limits. We did not require the Applicant to submit the analyses for the PT limits because typically the regulatory process for reviewing PT limits is to have licensees submit them for Staff review and approval six months to a year before the expiration date of the PT limits that are contained in the technical specifications for the plant.

Since the 10 CFR Part 54 requires you to do your review of the application consistent with the current licensing basis for the plant, we didn't see any reason to change that process. What will happen is the Applicant will submit the PT limits for the extended periods of operation prior to entering into them. The Staff will review them appropriately through the regulatory process that's consistent with 10 CFR 50.90.

The remaining two, the TLAA for pressurized thermal shock or PTS and the TLAA for ductility or in other words upper shelf energy or USE, the Applicant did provide the analyses and the relevant data in the application consistent with 10 CFR Part 54. It's required. They did the appropriate thing. The Staff has a database of relevant data from

the industry that relate to these assessments. We performed an independent assessment of the data using the appropriate calculations and the applicable rules.

The rules that are relevant to this are 10 CFR 50.61 for protection of the vessel against pressurized thermal shock and 10 CFR Part 50, Appendix G for evaluating the vessel materials for upper shelf energy. Related to these assessments is the reactor vessel surveillance program that's required by 10 CFR Part 50, Appendix H. They actually credit that program as one of their AMPs for the reactor vessel.

With regard to these assessments, we did make sure and included appropriate reviewers from the Reactor Systems Branch to make sure that the neutron fluences that the Applicant was projecting for the extended periods of operation were valid. We asked RAIs on the fluences, not with regard to the TLAAs but actually on the aging management program for the reactor vessel surveillance program. The Applicant provided all the relevant information we needed on the fluence methodologies and actually the data that inputted into the time-limited aging analyses. The Staff found the projected fluences for the reactor vessel materials to be applicable.

Going on with the independent assessments,

both the Staff's assessments and the Applicant's assessments were PTS and upper shelf energy demonstrated that the reactor vessel materials will meet the applicable screening criteria stated in the regulations for each assessment and that therefore, the reactor vessel materials would be protected during the extended periods of operation. So we didn't have any further need in our eyes to evaluate these programs further. We found the TLAAs to be acceptable for the periods.

MEMBER ROSEN: What sort of margin did you find through the screening criteria?

MR. MEDOFF: I have that. If you'd like a little bit of data.

MEMBER ROSEN: Yes. It goes a long way.

MR. MEDOFF: Okay. For PTS, the screening criteria are 270 degrees F for axial weld materials and baseline metals, plates and forging materials. For circumferential weld materials, the screening criteria are 300 degrees F. Now, I need to state that the limiting material in terms of the PTS is not determined how close you get to that. Well, it's really determined by the delta.

So for instance, if you have an axial weld that's at 260 compared to 270, that would be a ten

degree margin that they have. You might have a circ weld at 280. When you compare it to 300, it has a 20 degree margin, so even though the RTPTS for the axial weld is lower, it's actually the limiting material because the margin is less, the delta is less. That's really what we used to determine what the limiting material is for PTS.

MEMBER FORD: Jim, for instance, for McGuire Unit 1 using the 10 CFR 50.61 bounding color collisions, they are hitting on one of the welds the PTS criteria of 270.

MR. MEDOFF: We do not find that for any of the reactor vessel materials for PTS for McGuire.

MEMBER FORD: No. I'll get to that. If you let me finish my question first of all. In this table 4.2-5 in their application, they have 270 as the criterion, the analysis using 10 CFR 50.61 to be their RTPTS value which is the criterion and yet they credit the fact that their surveillance samples show an RTPTS of 225, and they say it's okay.

Now, surely you're mixing up apples and oranges there. You're looking at a bounding criterion and the other one is the actual data from the surveillance samples. Can you do that? I'm surprised.

MR. MEDOFF: Actually, the way we handle the vessel materials is the Staff always encourages them to use surveillance data if they are available for the heat of material in question. Not all of the materials in the reactor vessel are represented in the reactor vessel surveillance programs for the plants. They may be represented in some programs for sister plants where we then encourage them to use sister data. If you use the tables to establish the RTPTS, you might get a different value than you get for the --

MEMBER FORD: Surveillance status.

MR. MEDOFF: That you get for using the surveillance status. So we do encourage them to use the surveillance.

MEMBER FORD: But they are averaging about 70 degrees F difference between their surveillance data, the 10 CFR 50.61 color collisions on the average, about 70 degrees higher.

MR. MEDOFF: Than when using the tables.

MEMBER FORD: Yes. I guess my question to you is obviously you must have observed that. Did it give you any concern? The fact that they want to use a lower --

MR. MEDOFF: No. Actually what the rule

requires is if they have credible surveillance data and they have less margin using the surveillance data, they are required to use them as the basis for establishing the RTPTS value for the material in question.

MEMBER FORD: I'm not really so much concerned about what the rule says. It's more a question of what makes engineering sense. If in one case, you're using a bounding criterion. The 10 CFR 50.61 analysis, you can use that in one case. But you're allowed to use a less conservative value, this case, which comes out to the surveillance data. So they're able to choose which ever one that they would like to use.

MS. FRANOVICH: Barry Elliot is jumping at the bit to address your question.

MEMBER FORD: Go for it.

MR. ELLIOT: Jim has explained the process a little bit. I want to explain how we got there and why the number you could use is surveillance material. We set up criteria which must be established before you can use the surveillance data. You just can't use any surveillance data. It's specific criteria. It's in the Reg Guide 1.99, Rev. 2. It's in the PTS Rule.

If you can meet that criteria, then you

can use surveillance material. The reason for that is as you said the table of guidance is a bounding value. If you have actual data that actually represents your vessel that is much better than bounding data, then you should use it. This is what the case is here. They have proven to us using the guidance in our Reg Guide that their data is applicable to their vessel. So therefore, we let them use it.

CHAIRMAN BONACA: You said a precondition is that you meet the criteria.

MR. ELLIOT: Right. They met the criteria, and that's the basis for our saying they could use it. But there's criteria in the guidance they have to meet.

CHAIRMAN BONACA: Okay. Criteria, not necessarily the 270.

MR. ELLIOT: No. It's the criteria in guidance for the material. The surveillance material must meet this guidance.

MR. MEDOFF: This is credibility criteria in the Reg Guide and the rule for evaluating the data.

CHAIRMAN BONACA: The only thing I would like to ask you is this now. Not enough information in tables is a problem, but too much information.

MR. ELLIOT: But also, the issue here that

affects this is --

MR. MEDOFF: Right. I'm going to get to that later.

MR. ELLIOT: That's a very important issue.

CHAIRMAN BONACA: In fact, I received this at the last minute before I left to come here. This is an answer for additional information. We revise tables.

MR. MEDOFF: Right. I'm going to get to that.

CHAIRMAN BONACA: And all these tables look different from one plant to another plant and this table to this. So I'm very confused now.

MR. MEDOFF: I'm going to get to all of this.

MS. FRANOVICH: But before you start, Noel Dudley suggested I send that to you, so if that doesn't please you, I'll be sure to let Noel know.

CHAIRMAN BONACA: Not enough information is a problem. Too much information is also a problem.

MS. FRANOVICH: I understand.

CHAIRMAN BONACA: The thing is that I understood what you were trying to do here, but there was no correspondence in the form of the tables. So

I could not compare table to table.

MS. FRANOVICH: Right.

MR. ELLIOT: See, when you use the tables, you're going to get what we consider a bounding value. If you use surveillance material, your subject then results in the surveillance material.

MR. MEDOFF: And that's really specific to your vessel.

MR. ELLIOT: So that as more surveillance material comes out, it could impact where you are relative to the screening criteria and in fact it could put you over the screening criteria, not that it's going to put them over the screening criteria, but it's a part of the open issue.

MR. MEDOFF: Since Dr. Powers likes the data so much, I'm going to give him some values here. For McGuire 1, the RTPTS value that we calculated was 225. That's sufficient margin against a screening criteria for a longitude and weld of 270 degrees. Actually, this was based on use of credible surveillance data where I went into the reactor vessel integrity database, looked over the data. The data was credible, so we fully encourage the Applicant to use that data for that material. Actually, the McGuire 1 vessel for PTS was limiting relative to

McGuire 2 and either of the Catawba units.

For upper shelf energy, the limiting vessel is Catawba Unit 2. It has a limiting upper shelf energy of 51 foot-pounds. What the tendency --

MEMBER POWERS: In the criteria, there's 50.

MR. MEDOFF: That's why I brought up the issue of fluency. Remembering the ACRS comment from the Surry, North Anna ACRS meeting, one of the concerns was that if you were close to the screening criteria, if your fluency methods were slightly off and you had a slightly higher fluency, it could make you exceed the screening criteria if you were dealing with PTS or fall under the screening criteria if you're dealing with upper shelf energy.

That's why I emphasize that we did go to Lambrose Lois in the Reactor System Branch. We had them look over the McGuire and Catawba fluency methodologies. He did find their methods acceptable and that the projected fluences for extended period of operation were valid for the TLAAs. So right now I do not have any reason to question that 51 foot-pound value.

Even if they are off, and I'm not saying they are. I have no reason to say they are. If you

were below 50 foot-pounds what the rule would tell you to do is perform an equivalent margins analysis to demonstrate that you still had acceptable margins.

MEMBER POWERS: It seems to me that it's one worth flagging. They are going to end up doing a margins analysis on this plan by the end of life.

MR. MEDOFF: And that may be so, and they will do it if when they pull the next capsule it affects it and brings it under 50 foot-pounds. So it's adequately addressed in the rule and what they would be required to do.

MEMBER POWERS: See, that's what keeps it from going to the pyramids here, Steve.

MEMBER ROSEN: It's not the groundwater.

MEMBER POWERS: Well, if it went to the age of the pyramids, you might have to worry about the groundwater but not before.

MR. MEDOFF: With regard to the open item, it was really an open item that was issued for tracking purposes. The McGuire 1 reactor vessel has a weld heat that is common both the McGuire Unit 1 as well as Diablo Canyon Unit 2. It's in both surveillance programs. The licensee for Diablo Canyon just pulled the capsule, so we really issued an open item for tracking purposes and we asked the Applicant

to submit the data just to ensure and confirm that the data won't invalidate their TLAA results for the reactor vessel.

MS. FRANOVICH: And that's just for McGuire Unit 1.

MR. MEDOFF: Right.

MS. FRANOVICH: Any questions on the USE and PTS TLAAs?

CHAIRMAN BONACA: Except some of these tables, the Section 4 would be revised. Right? There are some changes.

MR. MEDOFF: Well, for McGuire 1 and only for the relevant heat.

CHAIRMAN BONACA: Okay.

MS. FRANOVICH: Thank you, Jim. Okay. Jim, we appreciate your presentation. The next slide addresses metal fatigue. John Fair is our presenter on the Staff's evaluation of this TLAA.

MR. FAIR: Yes. I'm John Fair from the Mechanical Engineering Branch and with me to discuss one of the issues would be Barry Elliot. In the area of metal fatigue in the SER you'll see four items that were prominently addressed. One of them is the thermal fatigue management program which is a program that they count the number of design cycles at the

plant that were used in the fatigue analyses of the components and compare those to what was used in the original design to make sure they don't go outside the design limits during the period of extended operation. This is similar to the programs used at other facilities.

I'll just mention that there was one item that came up in the review of this. We asked the Applicant to tell us which cycles that were specified in the FSARs for Catawba and McGuire they were actually tracking. We pretty much agreed with which ones they decided they didn't have to track because they were not significant or other reviews had shown they had not been significant. However, there was one item that had to do with the charging system let-down and charging flow changes which when we went back and looked at our evaluations in NUREG 6260 which is related to the environmental effects we found that they did have a significant fatigue usage when environmental effects were included in the evaluation of those transients.

So we asked the Applicant why they considered the fatigue insignificant for these transients at Catawba and McGuire. The Applicant came back. We had a meeting with them. They brought in

the actual design calculations. From reviewing the design calculations, the analysts at the time took a look at the delta T changes for these transients. Based on their judgement, they made the judgement that you would not have a significant stress and therefore would have an insignificant fatigue usage on these. That's the basis that they're not tracking these particular transients.

Another area that we looked at in this was there's a series of Westinghouse topical reports that Staff had previously reviewed and we had identified some action items in. This Applicant did not reference these reports and did not incorporate them into the LRA. However, we did ask questions on the action items just to make sure we had the issues covered.

The Applicant reminded us on several occasions that they did not incorporate these and did not necessarily agree with the action items, but they did provide us responses on these. On one of them which is the pressurizer WCAP report, we do have an open item which they have given us subsequent information on to resolve. I'll discuss that in a minute.

The third major area we looked at was

environmental fatigue. Again, we did the same thing we've done on past applications which is requested that they look at the six components in NUREG 6260 and do an assessment of those environmental fatigue. Again, we have an open item on that which I'll discuss in a minute. However, the Applicant on this one has given us a commitment to do the evaluation prior to the period of extended operation, so they have not done the up-front evaluation but have given the committment to do the evaluation prior to the period of extended operation.

The fourth item that we looked at in this section had to do with underclad cracking. This was not addressed in the LRA. However, we did ask an RAI on this item. As a result of the RAI we did identify an open item.

The next thing I'll get into is a discussion of the open item. The first one has to do with this Westinghouse topical report. The Westinghouse report identified a number of pressurizer subcomponents that had high fatigue usage and had a potential for exceeding a usage factor of one during the period of extended operation based on a simple extrapolation. We requested that the Applicant provide us the actual fatigue usage factors for these

components and tell us whether they've addressed the issues identified with in-surge and out-surge and to give us some kind of discussion on the impact of the environmental fatigue issue on these components.

The Applicant did say that they had addressed the in-surge and out-surge issue. They provided us with the design-basis fatigue usage factors for the subcomponents. They have also stated that their thermal fatigue management program is intended to make sure they don't exceed the number of design cycles during the period of extended operation so that those usage factors won't be exceeded. However, they did not do an assessment of the environmental impact, so the Staff has decided that we will do the assessment for them on these components and discuss it in the final safety evaluation report.

What we intend to do is just do a fairly simple assessment and identify those components we think might have a problem in the period of extended operation. Similar to what we have done for other Westinghouse plants which are Turkey Point and Surry, North Anna is to stick with the pressurizer surge line nozzle as the leading indicator for fatigue usage due to environmental effects and if that particular sample shows a problem during the period of extended

operation, to request that they go back and relook at these particular components in the pressurizer.

The next open item was the evaluation of the environmental fatigue effects. Again, as I said previously, the licensee chose to make a committment to do the evaluation prior to the period of extended operation. This was the same committment that they had made on Oconee.

Some licensees are doing the evaluation right now and giving us the results and others are making the committment to do it prior to the period of extended operation. So in lieu of them doing the evaluation now, we requested that they give us the design usage factors so that we can make some kind of internal assessment of the significance for the period of extended operation. We will discuss that in the final safety evaluation report.

I'm going to jump the issue on underclad cracking because Barry Elliot is going to discuss it. The next item that I had was the update of the FSAR supplement. Basically the FSAR supplement and the license renewal application had a very skimpy discussion of the thermal fatigue management program. We requested them to give us a little more discussion of that and put it in the FSAR supplement. They have

complied with that in their recent submittal, so that issue would be resolved.

We also asked them to discuss the committment to do the evaluation for the environmental effects prior to the period of extended operation. They've also supplied that additional information for the FSAR supplement, so that issue will be resolved. The final issue in this area is the underclad cracking. I'll turn it over to Barry.

MS. FRANOVICH: But before you can turn it over to Barry, I just wanted to indicate that for these Section 4.3 open items the only one that remains open at this point is the underclad cracking concern. That's with regard to McGuire 2. I believe the handout indicates McGuire 1, but it's really a McGuire 2 concern.

The other three open items that John Fair just discussed are confirmatory at this point. In fact, I believe they're resolved. I think we've reviewed the interim response and found it acceptable, so these are resolved at this point. With that, I'll turn the discussion of underclad cracking over to Barry Elliot.

MR. ELLIOT: Thank you. Thank you, John and thank you, Rani. Barry Elliot, Materials and

Chemical Engineering Branch.

Underclad cracking is an issue for forgings which have course grain, microstructure and have clad that has been applied using high heat input. It's a fabrication process problem. Guidance in this area is given by the Staff Reg Guide 1.43. This is an issue that we raised with McGuire and Catawba. We raised it for all four units.

They were able to present data and information on all the units except for McGuire 2 that precluded this type of cracking for those other units. McGuire 2 couldn't present that type of information, so we had to assume that this type of cracking could appear. In order to resolve this issue, the Applicant needs to perform a fatigue analysis of crack growth and neutron eradiation embrittlement.

For this case, neutron erradiation embrittlement was really not a concern. I looked at the forgings. The RTPTS values at 60 years for these forgings only go to 150 degrees Fahrenheit, so that shouldn't be a concern. The real issue here would be the need to provide their own analysis or the use of topical reporting analysis and to show that the fatigue transients that are assumed in the analysis would bound the 60 years of the life of the plant.

Any questions?

MS. FRANOVICH: Okay. Thank you, Barry. With that, we'll go on to the next presentation which is Section 4.7. It's actually 4.7.2 or 1 of the SER. Simon Sheng was the lead reviewer of this TLAA governing leak before break. With that, I'll turn the presentation over to Simon.

MR. SHENG: Good afternoon. This is Simon Sheng with the Materials and Chemical Engineering Branch. Currently attending a three month bootcamp training for -- in the project.

Okay. When we review the leak before break issue, first of course we want to know whether they have any active degradation mechanism and then of course there's the thermal aging associated with the cast authentic standard steel material. For this issue, basically we checked their previous analysis that they applied for the LBB application probably more than ten years ago. In that analysis, there's another issue of course because in that analysis they show only 40 years of fatigue cycles in their crack analysis. So we also need to review these items very carefully to make sure that it's also good for the 60 year application.

Let me address the thermal aging effect

first. When we looked at the original analysis, we found out that in the very beginning they did not use the transient properties for the material. In other words, the thermal aging will saturate and reach almost a constant property once it's beyond certain years of operation. Fortunately they used the bounding material property which is even lower than the saturated properties in the original analysis. That's why this thermal aging effect is not a problem in the extended period of operation.

In the review, we're also checking their plant specific, or I should say their Westinghouse specific data against the data published in the NUREG by Argonne. The data is comparable, so we are satisfied that they used a low enough material property, fracture toughness property in their original analysis.

Of course another degradation mechanism is probably the V.C. Summer issue. Our Branch Chief Bill Bateman has already addressed that thoroughly, so I'm not going to talk about anything there. I just want to say for that fatigue crack growing for 40 years that they did not choose to revise the analysis but assumed a 60 year fatigue cycles. Instead, they relied on the thermal fatigue program by actually

counting the fatigue cycles along the operation future years. The reason that they can do that is because they are very conservative in their original analysis assuming they are going to accumulate a lot of certain cycles yearly but looking back they have plenty of margin. So they choose to do it this way.

Suppose that in the future by actual counting they found out that they are going to violate the original assumptions. They would consider a lot of options while they are including revised analysis by using the realistic assumptions. Basically they have addressed all the important points, and we are satisfied. Any questions?

MS. FRANOVICH: Okay. Thank you, Simon. Before we go to our concluding remarks, I wanted to touch base on the pond volume TLAA. I've looked at the application and confirmed what Debbie Keiser told the Staff and the Committee a few minutes ago. On page 4.7-4 of the license renewal application, they talk about the sounding.

It says "The UFSAR includes a committment that soundings will be taken around the SNS. There will be an intake structure at five year intervals to assure that sediment deposits will not adversely affect the operation of the standby nuclear

servicewater system. Although an earlier calculation for the volume of the pond was documented, more recent calculations have been performed which validate the volume of the pond."

If you look under the parameters monitored or inspected element, it says "This aging management program, the standby nuclear servicewater pond volume program requires a topographic survey of the pond to determine the topography of the bottom of the pond. Calculations are then performed using the survey data to verify that pond volume is adequate." So I didn't know that off the top of my head, but I checked. It's in the application.

MEMBER ROSEN: Is that something they're going to begin during the extended term or something that they're going to begin now?

MS. FRANOVICH: Would you --

MR. GILL: This is Bob Gill. That is a current program that's currently in the FSAR. If you look at Appendix A for Catawba, you'll see a summary description of that program. We do it today.

MEMBER ROSEN: Thank you.

MR. GILL: Actually, it's part of initial licensing 20 some years ago.

MS. FRANOVICH: Described in your UFSAR

today.

MR. GILL: It's in UFSAR today, so it's a current program.

MS. FRANOVICH: Okay. Having touched on that, I'd just like to bring our presentation to a close with a few concluding remarks. Staff still has work to do. We have to focus on open items and confirmatory items. Duke's official response to all of our SER open items is anticipated by October 28 which is just a few weeks away.

The hearing process continues. As I indicated, we're in abeyance now on the remaining SAMA contention but pending word back from the Commission on clarification. To what extent that contention was partially admitted, we're still officially in the hearing process. The final SER will be issued on or before January 6 of next year. That concludes the Staff's presentation unless there are any other questions at this point.

CHAIRMAN BONACA: Any other questions for the Members, comments? Thank you. I certainly would like to congratulate you personally and the Staff for an excellent presentation. It was very informative. I think I'm conveying the perspectives of the Members here. So I thank you again for that.

MS. FRANOVICH: Thank you for the opportunity.

CHAIRMAN BONACA: Now what we're going to do is go around the table and get from the Members their views of what they heard today. Then at the end, we'll decide how to address the full Committee. We don't need the transcriber anymore. Okay. We can just turn it off.

(Whereupon, the foregoing matter went off the record at 4:00 p.m. and went back on the record at 4:01 p.m.)

CHAIRMAN BONACA: Let me just turn the transcription on again. Let me give you first of all my sense before I get your further comments. As you know, we have to talk about what we're going to do with the full Committee. Do we have to have a presentation of the licensee and the Staff? My judgement is that we do not. I think I would like to just prepare a summary and present it to the Committee when we get to the full Committee in the later part of this week.

The reason is I feel that the application is quite effective and complete. Although there are certain issues we have to discuss. Also the SER is effective. A complete review has been pretty

thorough, so that is my judgement. I would like to just propose it to you now and then go around the table and see what issues we feel we need to bring up to the full Committee and how we should handle it too. So I will start with you, Peter.

MEMBER FORD: I echo, Mario, your views. I was very encouraged by the format of this meeting in comparison to Peter's -- I got a much better idea of what the assumptions and what the facts are behind some of the Staff's conclusions.

I don't see any urgent safety concerns about license renewal for specifically McGuire and Catawba plants as they apply to degradation of structure materials. Those degradation issues are covered adequately in the current aging management programs. I remain concerned that those programs are industry motivated as they should be, but they are reactive in nature.

It'll be 20 years before these particular plants go into license renewal, and things will happen in that 20 years; other things will crack, other things will corrode, et cetera. I hope that the industry as a whole have the capability of maintaining that push to come into a proactive mode for the aging management programs. As far as these plants are

concerned, I'm encouraged by the fact that the licensing nature is such that we can take into account those improvements and plans.

I'm also concerned about the rationale for one time inspections. Again, that's mitigated by the fact that once the need for those or the inadequacy of those one time inspections if it becomes apparent then there is a licensing process to cover it. I agree with your finding, Mario, that there is no big concern at least from my point of view.

CHAIRMAN BONACA: Thank you. Steve.

MEMBER ROSEN: Yes, Mario, thank you. I agree as well that there are no safety concerns at the moment, but I do have a number of specific points I'd like to offer. In particular, I thought the license application provided on CD-ROM by the way to me was a great help and in very good shape. The Staff's SER was also very well done. I remember when we complained about the degree of information in it. It is now very nicely complete. I wish it was on CD-ROM. It wasn't, but it has the information.

I had a few items here, some very good. I'd like to offer my kudos to the Staff on the pressure of picking up the problem with the pressurizer nozzles needed for the post-fire safe

shutdown. The fact that it has already been put into the interim Staff Guidance, that is a good demonstration not only of an alert reviewer but a good process to pick up the value of an alert reviewer for future plans and to look at whether or not this needs to be back-fit to past plants. All of that I can't say enough about the very complete response.

In the middle of places where I'm a little bit concerned, the fire protection issue, in particular, the jockey pump issue and the question of crediting fire barriers in the turbine building. Those are matters that I know Duke is still working on responses to those issues. I will follow that with a great interest.

I also had a feeling that we have perhaps a problem in the way we review things. I'm not sure. Let me just lay it out. We, the Staff, use the P&IDs to basically focus the scope of the review. I know from having been there and done that, that there's a lot of subsidiary documents that are in the engineering mix at the plant, for instance, instrument loop diagrams, the piping isometrics, the electrical elementaries, et cetera. It's not limited to those three, but beyond. If they were reviewed by the Staff, it might come to some additional conclusions

about what components need to be in the scope and what components may not need to be in the scope.

So just looking at the P&IDs, it might be possible that we could be missing something. I don't know. I'm uncomfortable about that and raise that issue as for something for Staff to think about perhaps and might want to do something different. So that's in the middle.

On the other side, I am concerned about the question of groundwater sampling. In my view, the Staff should require a groundwater sampling program to continue to confirm the basis for the subsurface structural lifetimes. It seems one of those things where the cost benefit would be very positive to do that. It's very easy to do and it's very important. If you find the wrong answer out, you'll be very glad you did if you find it out promptly. So those are my conclusions. I thought the review was very useful, and Staff's presentation was very strong.

CHAIRMAN BONACA: Thank you, Steve. Graham.

MEMBER LEITCH: Let me say at the outset I'd like to echo the positive comments that have been made about the Staff's presentation. I thought this was very well done, very well organized, formatted

very nicely. It made it very understandable and logical.

Concerning the application itself, I was initially quite concerned with the large number of open items, 41. As the discussion went on however that concerned lessened. It appears as though many of these are well on their way to resolution. Those relatively few that are not, I think there are some honest differences of opinion that are still going to be resolved. But it seems as though there are good legitimate reasons for those differences and not just hard unreasonable positions being taken on one side or the other. I think there's good movement in that direction to resolve these issues.

Like Steve, I was concerned about the open issues in the fire area. Again, it appears those issues are well on their way to resolution but not yet resolved. The data provided in Section 4, the time-limited aging analysis, I thought was very useful and gave me a lot more confidence than what I saw in the previous application because there were specific numbers and data there that were really helpful.

If you were asking, Mario, for us to give comments as to how we proceed from here, I agree with your thought. I notice there's a spot on the agenda

for the full Committee meeting Thursday or Friday, I forget which, to talk about this issue.

CHAIRMAN BONACA: We'll have some intermediate time because they said maybe there are so many open issues there may be something we may have to bring up to the full Committee, but clearly we're flexible on their time. It can be shrunk down. It will be welcomed by the Chairman of the Committee that we give back some of their time.

MEMBER LEITCH: I think really a brief summary by you as to what went on at this meeting would be adequate for the full Committee meeting at this time. I don't see any particular reason to be writing an interim letter on this matter. I think if we were going to write any letter, not that I'm proposing that we do, but I think one thing that we need to signal in any letter we write with regard to the license renewal program, and I think one issue that perhaps has come into more clear focus as a result of today's discussion is this tremendous amount of future inspection activity that is out there.

I think the Commission needs to understand that this is a significant workload for the future. And as we approve these license renewal applications, the work is far from done. There's a significant

amount of inspection activity out there. I know from what PT says they're already working on that, but I think we need at some point in time, I don't say that it necessarily relates to Catawba and McGuire, but perhaps some of these periodic discussion we have with the Commission we should make sure that they understand that --

CHAIRMAN BONACA: Maybe it's an item that we should bring up in a separate presentation.

MEMBER LEITCH: That there's a significant effort I guess.

MR. KUO: And I would suggest that as soon as we get the Inspection Procedure 71003 ready, we will come to the Committee and give you a briefing on that.

CHAIRMAN BONACA: We do have a commitment to address the request by the Commission. That may be the time to include a note from this organization.

MEMBER LEITCH: That's right. I think that's a good time to bring that up as well.

MEMBER ROSEN: Mario, the only thing I would add to that is I think we need with the full Committee to characterize the comments that are being made around the table in terms of some of these issues. I think that this is really a subcommittee of

the full Committee. Sometimes we have eight members out of the 11 come to these meetings, but here we really only have five members. What I'm trying to say is don't try to do it too quickly. The rest of the other Committee members need to hear some of this discussion on the key issues we've raised.

CHAIRMAN BONACA: Sure.

MEMBER LEITCH: That's all I had, Mario.

CHAIRMAN BONACA: Dana.

MEMBER POWERS: The first point I want to make is it's relatively important that we take the opportunity as we go through this license renewal for McGuire and Catawba to make sure the ACRS as a whole understands these plants well because the plants have the potential of coming up in deliberations in connection with other subjects and their possible role. So let us not downplay and creep to tersely the discussion of these plants.

Some things have appeared in this discussion that I think have generic interest to the Committee. I comment particularly on the safety culture implications of some of our discussions of the fire protection surveillances and what it might mean for the future aging management programs here. I note that we continue to see fire protection play a role

but may not be entirely consistent with what we currently perceive with this significance.

That's it. Many members have brought up points that I don't need to reiterate here. I will say that I personally think we need to discuss a little more this business of breaking down components like fans to get at the housings and whatnot. I grow itchy over this as perhaps circumventing the Commission's intent when I wrote the rule. Maybe it would be worth discussing that a little more.

CHAIRMAN BONACA: And the concern there would be looking at the --

MEMBER POWERS: Well, the comment made by the Applicant here that a fan is a fan is a fan. You have to break it down resonated with me. If I recall the language of the rule, I think whomever wrote it said a fan is a fan is a fan and didn't break it down.

CHAIRMAN BONACA: It also says a pump is a propeller and is a casing in this.

MEMBER POWERS: Well, they might well do that. I'd be interested in a little more discussion of that. There may be a good reason that I think a fan is not a fan but a collection of parts and whatnot. I would not like to circumvent or play games with what the Commission's intent was, whomever wrote

the rule.

Finally, I'll note that I'm not at all concerned with the potential changes in the groundwater over the coming 40 or 50 years affecting concrete structures at this particular site. If it was Texas, I'd be very concerned, but here, no problem.

MEMBER ROSEN: Most of what we're concerned with in Texas is above-ground.

MEMBER POWERS: They haven't got any water above-ground right now.

MEMBER ROSEN: The critters in the water are above-ground you want to be concerned with.

MEMBER POWERS: That's true. And the critters that walk the land in Texas you want to be concerned about too.

MEMBER ROSEN: Them too.

MEMBER POWERS: Especially the two-legged variety. Birds. I'm talking about birds.

CHAIRMAN BONACA: As far as my perspective on this, again, I voiced at the beginning the belief that was a very good presentation. I think it was a good application too. I must say that I came to the conclusion after thinking that maybe there were some problems in here because there were forty-plus open

items there that there is no way to correlate number of open items with the quality of the application. We just can't do that. Actually, I think in some cases some of the open items are important. They're stimulating and presenting different perspectives. I appreciate that.

A concern I really am developing somewhat is with the lead time over the time before we enter into the license renewal period. A lot of things will happen over the next 20 years, not only the programs will have to be revised. They may be totally different because the realities that are going to confront them are going to be very substantial and different from now.

Therefore, somebody mentioned the word bow wave, I believe, was that you, Steve, of commitments that may come and have to be addressed in the future. I'm not sure that there is a full appreciation for what that may mean for not only the Applicants but most of all the Staff that's going to be involved in all of these applications. It's going to be a huge amount of work.

MEMBER ROSEN: I'm more concerned with the Staff than the Applicant. I think Duke, for instance, answered the question of how they are going to manage

these commitments quite adequately. It's really how they manage a lot of things that they commit to now. It's part of their system.

They'll document these things internally. They'll track the hell out of them. They'll get the lead on them. They'll get people assigned. They'll do all those things. They have seven plants to do it in and the fairly stable workforce.

On the other hand, the NRC has not nearly as stable a workforce. It has 100 plants that will soon have the license renewal in my opinion. It's a bigger problem for the Staff than for the licensees.

CHAIRMAN BONACA: The last comment I would like to make is regarding the timing for providing the SER with open items to the ACRS. You may want to pay attention to it. I find that when you have a big, large number of open items and then they get closed between the moment when we see the SER and the moment you come here, we're coming with all kinds of signals.

I was looking at the reactor vessel internals, and I had a real problem of having just Oconee being inspected for all the other units. So I spent a little time looking back and going back and confirming this thing. Then I come here and find it was an issue and it was resolved. I had spent quite

a bit of time running around about nothing.

MS. FRANOVICH: That's a good comment. We'll take that back. I don't think it would be much burden on the Staff to just keep the ACRS apprised of the status of these open items, so we'll take that back.

CHAIRMAN BONACA: Or, I mean, I understand you have firm commitments you are making for certain dates. If you could move the meeting by one month, you probably would capture most of the items and wrap them up to where now there are only 11 out of the original 43. It's just a suggestion. I understand you have scheduling problems too.

MR. KUO: Dr. Bonaca, just one thing that we are looking at with the schedule. Originally for uncontested application or in the schedule it is 25 months. Actually, this plant's schedule is issued as 25 months, but since then we got the SRM from Commission that shortened this schedule from 25 to 22 months. In their rationale, they say in the schedule you saved us three months for us to make our decision.

Therefore, now that we are authorizing the NRR Director to issue the license, therefore we can cut three months. In reality, that's not so because in those three months we are not sitting there idle.

We have other things to do. We have to prepare a license package. We have to do a lot of other things. That really cut us down by one to two months. We will have to somehow find a place to get that to one to two months.

So in one way we are thinking about it to change the up-front schedule. Right now we have eight months from the date we received the application to the date we issue RAIs. That's eight months. That might be a little to liberal, so we probably can push that a little bit. Doing it that way, we could probably save a little time at the end, so the ACRS meeting is not going to be so pressing.

CHAIRMAN BONACA: Yes. One last thing is we were asked about the efficiency and effectiveness of the Commission admitting. I think it is going to be made out of a number of conformance. One of them certainly is not collapsing any further the size of the applications because the less information we get more RAIs are going to be asked and more time it is for all of us to review it.

So as you work with industry you might try to focus on what is an ideal format that is concise enough but provides sufficient information that maintains the number of RAIs to a limited number. I

mean, you've gone up from more than 100 from the previous application to 207 for this one. I don't know what the factors are, but in part I think it's the aggressive review that you gave to this one. With that, I think again it's a good application and good SER, so I'm looking forward to having the final SER coming to us in January.

So let me again complete this by saying what I sense from the Members the way I'm going to handle it is I'm going to prepare a summary. It may be a 20 minute summary. Then I'll have your help doing the presentation to the full Committee. I'll brief the full Committee on the salient issues of this application and SER. Then we will not have an interim letter at this time.

MEMBER LEITCH: Would it be your intention that a few of the key Staff people would be at that presentation?

CHAIRMAN BONACA: It may be worthwhile to have as a medium the Project Manager here present so that I can rely on you for specific details.

MS. FRANOVICH: I'd be delighted.

MEMBER ROSEN: It's always been useful in the past if we can impose on the Applicant to have a few key people who might want to listen to the full

Committee discussions too because some new things come up.

MS. FRANOVICH: Is there an ETA of the time?

CHAIRMAN BONACA: I'm not planning to have a full presentation with slides or anything. It'll be simply a summary of what happened today.

MS. FRANOVICH: Okay. But that will be two days hence on Thursday.

PARTICIPANT: It is right after lunch.

MS. FRANOVICH: Right after lunch. Okay. I'll be available.

MEMBER POWERS: Will you be on the record?

CHAIRMAN BONACA: Yes.

MEMBER POWERS: I suspect the licensee can probably just look at the record.

CHAIRMAN BONACA: Yes. I think so. All right. With that, I'll for ask any other comments at the end of this meeting. Okay. Off the record.

(Whereupon, the above-entitled matter concluded at 4:25 p.m.)

CERTIFICATE

This is to certify that the attached proceedings before the United States Nuclear Regulatory Commission in the matter of:

Name of Proceeding: Advisory Committee on Reactor Safeguards Plant License Renewal Subcommittee

Docket Number: N/A

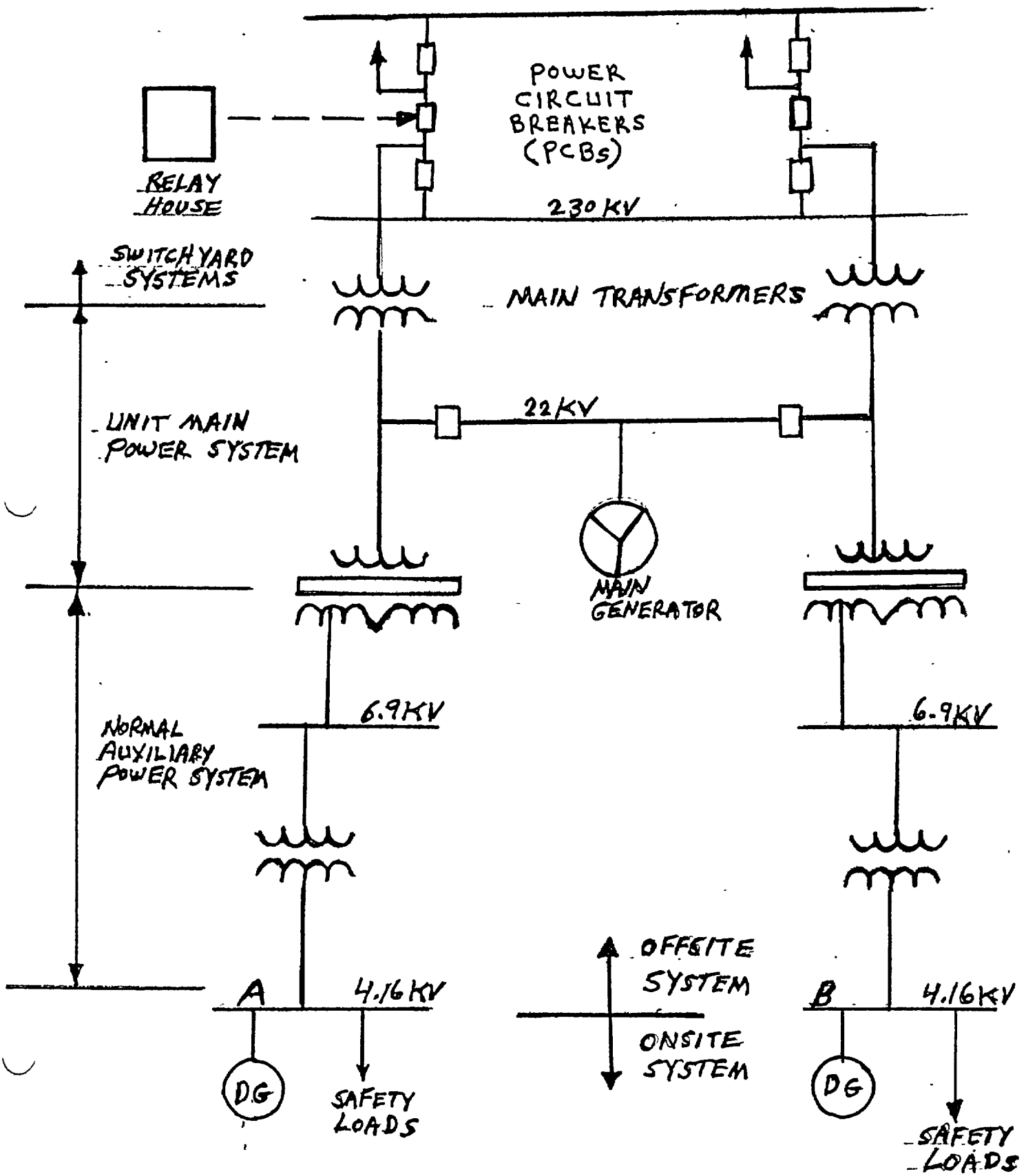
Location: Rockville, Maryland

were held as herein appears, and that this is the original transcript thereof for the file of the United States Nuclear Regulatory Commission taken by me and, thereafter reduced to typewriting by me or under the direction of the court reporting company, and that the transcript is a true and accurate record of the foregoing proceedings.

/s/ Rebecca Davis

Rebecca Davis
Official Reporter
Neal R. Gross & Co., Inc.

SBO POWER RECOVERY PATH



MNS & CNS pH, CHLORIDE AND SULPHATE vs. ACCEPT. LIMITS

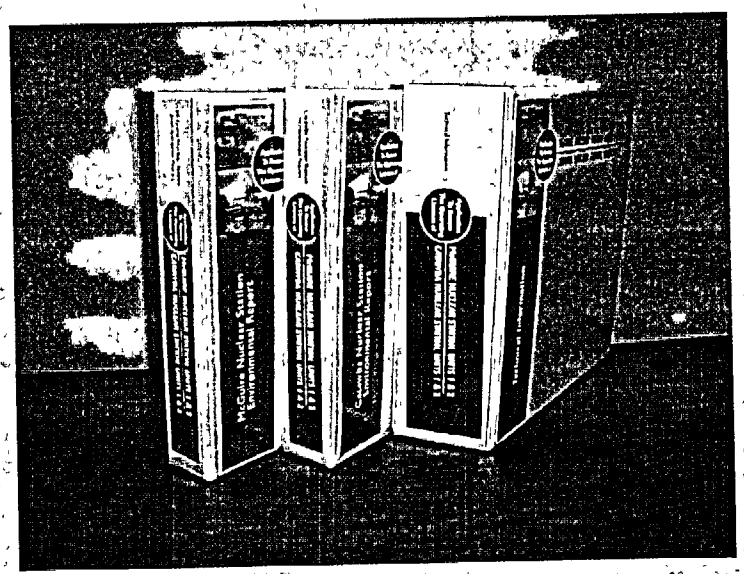
MNS Preop (8/21/62-9/11/81)	pH	Chlorides	Sulphate
Sample size	12525	1453	0
Mean	**6.64**	**4.14 ppm**	NA
Min.	5.20	1.10 ppm	NA
Max.	9.60	10.00 ppm	NA
MNS Postop (6/6/83-12/11/96)			
Sample size	7540	518	247
Mean	**6.58**	**5.40 ppm**	**5.52 ppm**
Min.	5.30	2.30 ppm	1.00 ppm
Max.	8.50	12,20 ppm	13.90 ppm
CNS Preop (6/9/71-3/12/85)			
Sample size	1540	277	0
Mean	**6.80**	**7.45 ppm**	NA
Min.	5.70	4.00 ppm	NA
Max.	9.30	16.00 ppm	NA
CNS Postop (9/9/86-11/11/96)			
Sample size	1022	211	3
Mean	**6.90**	**12.66 ppm**	**8.10 ppm**
Min.	5.90	3.30 ppm	4.70 ppm
Max.	8.90	28.00 ppm	10.20 ppm
Acceptable Limits	**>5.50**	**500 ppm**	**1500 ppm**

EARLIER LRA PLANTS' EXTENT OF COMPLIANCE TO THE INTERIM STAFF GUIDANCE (ISG) ON AGING MANAGEMENT OF CONCRETE COMPONENTS

CONCRETE STRUC/COMP.	CALV. CLIFFS	OCONEE	ANO-1	T.K. Pt
Access. Above Grade Reactor Buildg/Containment Struc.	Partial Yes	Partial Yes	Partial Yes	Yes
Inaccess. Below Grade Reactor Buildg/Cont. Struc.	Yes	Yes	Yes	Yes
Reactor Building Internal Struc.	No	No	No	Yes
Other Structures (Aux., DGB, TB. Control Bldgs., Etc)	No	No	No	Yes
Conc. Equip. Pads, Leach. Conc., Conc. Block Walls Etc.	No	Yes	Yes	Yes
Intake Structures	Yes	Yes	Yes	Yes
Extent of Overall Compliance	Partial Compl	Partial Compl.	Partial Compl.	Full Compl.

Duke Energy℠

McGuire – Catawba License Renewal



Presentation to:

Advisory Committee on Reactor Safeguards Plant License Renewal Subcommittee

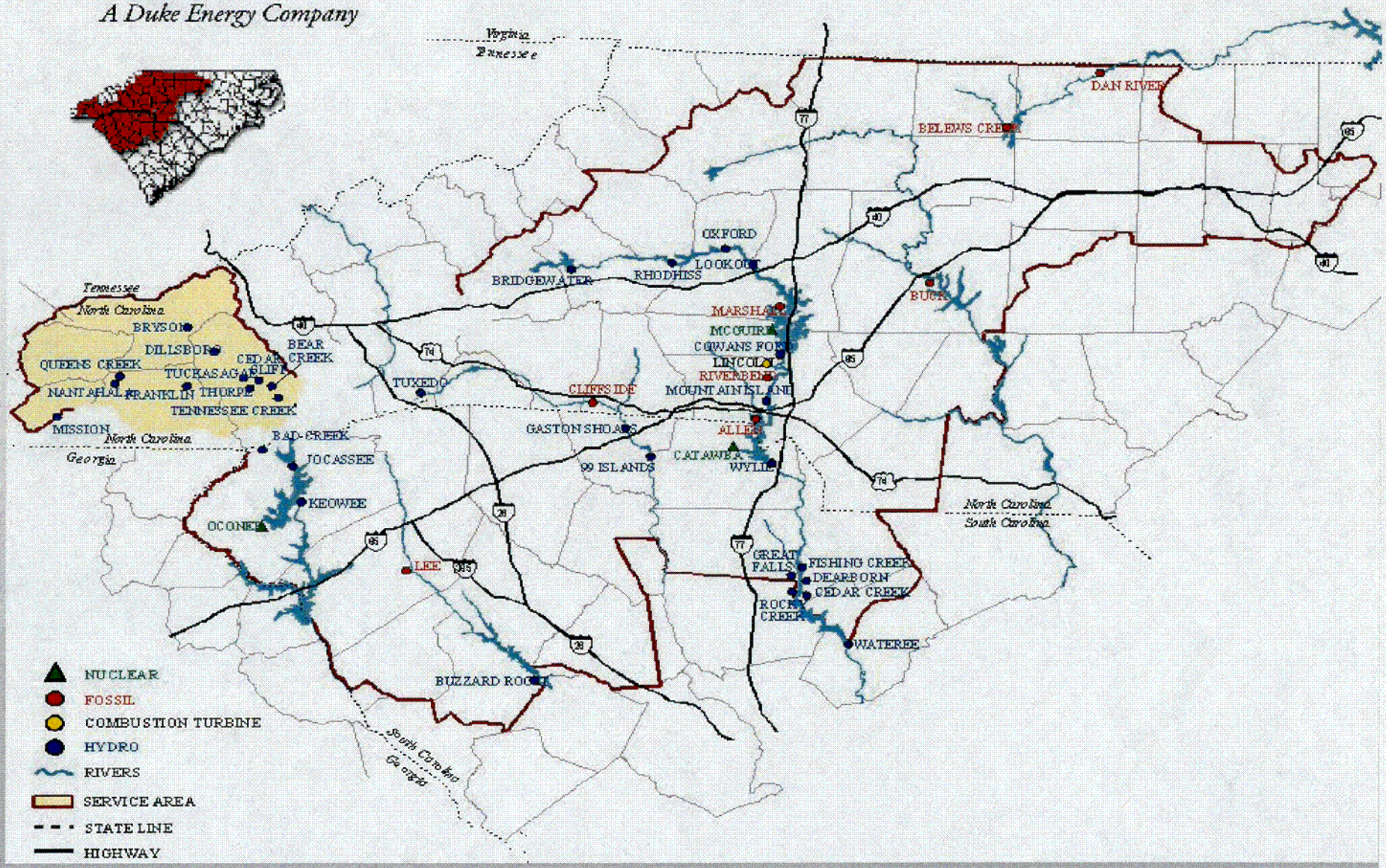
October 8, 2002

Duke Renewal Team

Team Member	Area of Focus	Industry Renewal Role
Paul Colaianni	Electrical	NEI Electrical Working Group
Bob Gill	Licensing	NEI Renewal Task Force, BWOG
Mary Hazeltine	Reactor Coolant	WOG License Renewal Committee
Debbie Keiser	Structural	NEI Structural Working Group
Rounette Nader	Mechanical	NEI Renewal Issue Team
Mike Semmler	Mechanical	NEI Mechanical Working Group
Greg Robison	Project Manager	NEI, EPRI, BWOG, WOG

Duke Power®
A Duke Energy Company

DUKE POWER GENERATING SYSTEM



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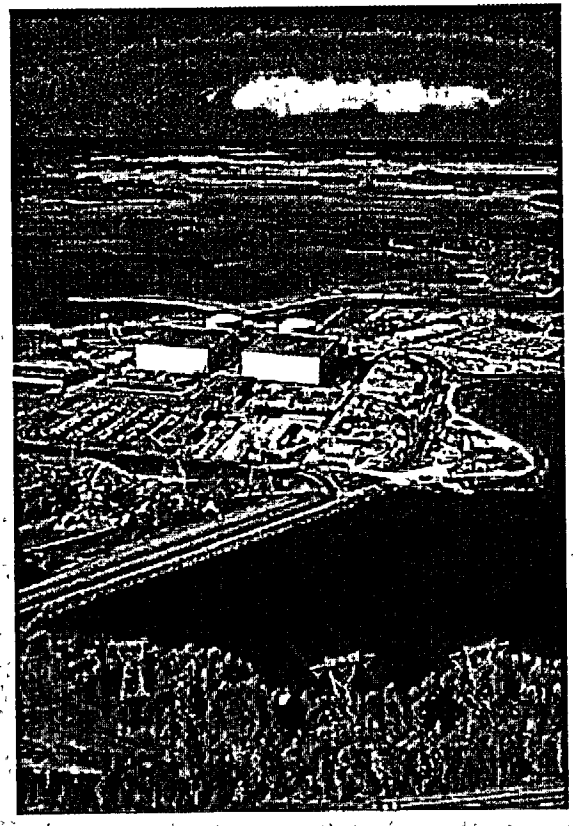
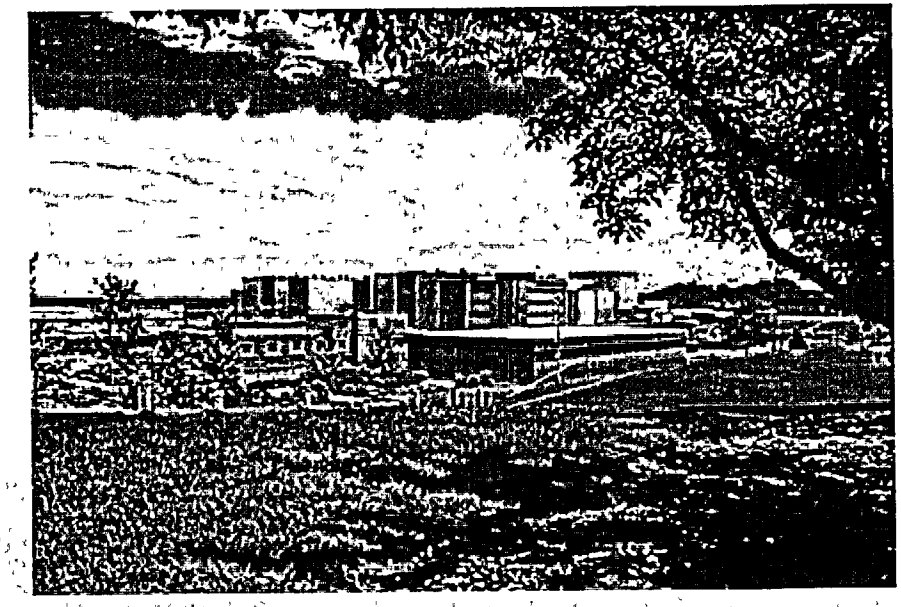
Duke Energy SM



McGuire Nuclear Station
Huntersville, North Carolina



Catawba Nuclear Station
York, South Carolina

Plant Description

McGuire	Catawba
■ McGuire Nuclear Station is a 2 Unit Site - 2258 MW total	■ Catawba Nuclear Station is a 2 Unit Site - 2258 MW total
■ Construction finished in early 1980's	■ Construction finished in early 1980's
■ Initial capital cost was approximately $1100/kW	■ Initial capital cost was approximately $1500/kW
■ Commercial operation began in ♦ 1981 - Unit 1 ♦ 1984 - Unit 2	■ Commercial operation began in ♦ 1985 - Unit 1 ♦ 1986 - Unit 2
■ Initial licenses expire in 2021 and 2023	■ Initial licenses expire in 2024 and 2026
■ About 1100 people are employed at McGuire	■ About 1100 people are employed at Catawba

Application Background

- McGuire and Catawba application involves the first SRP (NUREG-0800) plants to pursue renewal
- McGuire and Catawba are the first ice condenser containment plants to pursue renewal
- Steam generators have been replaced on McGuire 1 & 2 and Catawba 1
- Duke is first second-renewal applicant and the second two-site applicant

Application Background

- NRC approved Duke's exemption request from the 20 year requirement of 10 CFR 54.17(c)
- Expiration dates of each renewed license are unit specific
  - 20 years from expiration of current license or 40 years from date of issuance of the renewed operating license, whichever is earlier
- Safety and environmental reviews cover 60-years

Application Background

- Application preparation began in January 2000 with submittal in June 2001
- August 2000 draft versions of the guidance documents were used, including application format
- July 2001 final versions of guidance documents were received after Application submittal

Integrated Plant Assessment Topics

- Integrated Plant Assessment steps
  - Scoping/Screening
  - Aging Management Review
- IPA performed along discipline lines
  - Mechanical
  - Reactor Coolant (Class 1)
  - Structural
  - Electrical

Scoping / Screening

- Scoping and Screening methodology for all disciplines given in Section 2.1 of the Application
- Plant-level scoping results for all disciplines given in Section 2.2 of the Application
- Scoping and screening results descriptions:
  - Mechanical and Reactor Coolant (including links to drawings and UFSAR) in Section 2.3
  - Structural in Section 2.4
  - Electrical in Section 2.5- the bounding approach used for electrical results in the scoping criteria only being applied when beneficial to eliminate scope

Scoping / Screening

- System and structure descriptions are generically applicable to both McGuire and Catawba unless otherwise stated
- Electrical and Instrumentation and Control descriptions are done on a component basis and are generically applicable to both McGuire and Catawba unless otherwise stated
- All disciplines' screening results are included with Aging Management Review results in Chapter 3 tables of the Application

Aging Management Review Methodology

- The Aging Management Review process is the same as was used for Oconee:

Component
+Aging Effect
+Program
+Demonstration
Reasonable Assurance

Aging Management Review Methodology

- Aging Effects Determination
  - Component Materials
  - Component Environments
  - Operating Experience
  - Industry "tools" (documented by EPRI)
- Process identifies those aging effects that, if left unmanaged, could cause a loss of intended function prior to the end of the extended period of operation

Aging Management Review Results

- Chapter 3 of the Application presents Aging Management Review results for all disciplines in the 6-column table format

1	2	3	4	5	6
Component Type	Component Function	Material	Environment	Aging Effect	Aging Management Programs and Activities

Aging Management Programs / Activities

- 54 total programs credited in safety work
  - 51 aging management programs
    - » 34 are existing programs
    - » 9 are new programs for renewal
    - » 8 are one-time inspections
  - 3 time-limited aging analysis programs
- 48 of these are common to both sites (91%)
- 31 are equivalent to Oconee renewal programs accepted by NRC (60%)

Time-limited Aging Analyses

- Involve plant-specific design analyses
- Focus on boundary conditions or assumptions based on 40-year operating term
- Requirement to assure analyses are valid for the extended period of operation or that the effects of aging will be adequately managed for 60 years

Time-limited Aging Analyses

The TLAA chapter of the Application follows format of Chapter 4 of the SRP-LR:

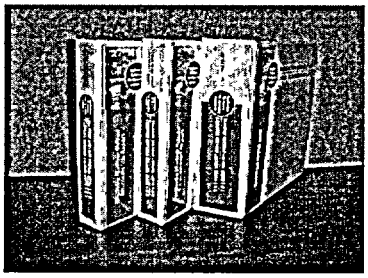
- Reactor Vessel Embrittlement
  - PTS, USE and P-T limits are analyzed for 60-years
- Metal Fatigue
  - *Thermal Fatigue Management Program* is credited
- EQ of Electric Equipment
  - *Environmental Qualification Program* is credited

Time-limited Aging Analyses

- Plant Specific TLAA
  - RCP Flywheel fatigue for 60-years
  - Leak-before-break analyzed for 60-years
  - Catawba specific TLAA - SNSW pond volume monitoring credits *SNSW Pond Volume Program*

Site Implementation

- Defined Process
  - EDM-229, *Engineering Oversight of License Renewal Aging Management Programs and Activities*
- Handbook for Aging Management Site Point of Contact (SPOC)
  - *Site-specific specification developed by the Renewal Project*
- Aging Management SPOC
- Training for appropriate people
  - *Training delivered by members of the Renewal Project*



Discussion

McGuire and Catawba License Renewal SER with Open Items

Staff Presentation to the ACRS
Rani Franovich, Project Manager
October 8, 2002

Agenda

- Opening Remarks.....G Leitch
- Staff Introduction.....P.T Kuo
- Overview.....R. Franovich
- .....C. Julian
- Applicant Presentation.....G. Robison
- Scoping and Screening Methodology.....B. Rogers
- Scoping and Screening Results.....R. Franovich
- Aging Management Programs.....R Franovich

Agenda (continued)

- Reactor Coolant System AMR.....J. Medoff
- Engineered Safety Features AMR..... R. Franovich
- Auxiliary Systems AMR ..... R. Franovich
- Steam and Power Conversion Systems AMR.....R. Franovich
- Containment, Structures and Component Supports AMR..... D. Jeng
- Electrical and I&C Components AMR... R. Franovich

Agenda (continued)

- TLAAs
  - Overview..... .... R. Franovich
  - Reactor vessel neutron embrittlement..... ..... J. Medoff
  - Thermal fatigue .... J. Fair
  - Underclad cracking .... B Elliot
  - Leak-before-break..... .... S. Sheng

Overview

- LRA submitted June 13, 2001
- McGuire Nuclear Station
  - Mecklenburg County, North Carolina
  - Four-loop Westinghouse ice condenser
  - Unit 1 expires June 12, 2021
  - Unit 2 expires March 3, 2023*
  - Both units generate 3411 megawatts thermal

*Exemption request approved

Overview (continued)

- Catawba Nuclear Station
  - York County, South Carolina
  - Four-loop Westinghouse ice condenser
  - Unit 1 expires December 6, 2024*
  - Unit 2 expires February 24, 2026*
  - Both units generate 3411 megawatts thermal

* Exemption requests approved

Principles of License Renewal

- The regulatory process is adequate to ensure that the licensing bases of all currently operating plants provide and maintain an acceptable level of safety, with the possible exception of the detrimental effects of aging.
- Plant-specific licensing basis must be maintained during the renewal term in the same manner and to the same extent as during the original licensing term.

Hearings

- Intervenors
  - Blue Ridge Environmental Defense League
  - Nuclear Information & Resource Service
- Contentions
  - Potential use of MOX
  - Severe Accident Mitigation Analysis for SBO

Requests for Additional Information (RAIs)

- 273 formal RAIs issued in January 2002
  - Electrical (6)
  - Scoping Methodology (4)
  - Plant-level Scoping Results (5)
  - Mechanical ESF Scoping (19)
  - Mechanical ESF AMR (6)
  - Mechanical Aux Systems Scoping (75)

Requests for Additional Information (RAIs)

- 273 formal RAIs (continued)
  - Mechanical Aux Systems AMR (37)
  - RCS Scoping, AMR, TLAAs and AMPs (38)
  - Mechanical AMPs (34)
  - Structures Scoping, AMR, TLAAs and AMPs (49)
- Responses received March 1-April 15, 2002
- 21 conference calls

NRC Audit and Inspections

- Scoping Methodology Review Audit
  - October 15-19, 2001
  - Seismic II/I scoping evaluated
- Scoping Inspection
  - March 18-22, 2002
- Aging Management Review Inspection
  - July 8-12 and July 22-26, 2002

License Renewal Inspections

- License Renewal Manual Chapter
  - MC2516
- License Renewal Inspection Procedure
  - IP71002
- Site-specific inspection plans
- Schedule followed standard 30-month model
- Resources allocated
  - Team of 5 to 6 inspectors

License Renewal Inspections (continued)

- Scoping and Screening Results Inspection
  - One week visit to Duke corporate offices in Charlotte
  - Sample of systems and structures inspected
  - Objective: to confirm that the applicant included all systems, structures and components required by the rule
  - Findings

License Renewal Inspections (continued)

- Aging Management Programs Inspection
  - Two weeks (one week at each plant)
  - All aging management programs reviewed
  - Objective: to confirm that existing AMPs are effective and to examine the applicant's plans for enhancing certain existing programs and establishing new ones
  - Findings
- Optional Final Inspection

Safety Evaluation Report Format

- Chapter 1: Introduction and open items
- Chapter 2: Scoping and Screening
- Chapter 3: Aging Management Review Results
- Chapter 4: Time-limited Aging Analyses

Open and Confirmatory Items

- Meetings with Duke 9/17-9/19 and 10/1
- 13 of 41 SER open items still unresolved
- 1 open item added (4 2-1) to address potential change to neutron embrittlement TLAAs
- 30 confirmatory items
- 2 resolved
- October 2, 2002, interim response letter from Duke is under staff review
- Final letter from Duke expected October 28, 2002

Open and Confirmatory Items (continued)

- Section 2.3: 5 open, 9 confirmatory
- Section 2.5: 1 confirmatory
- Section 3 0: 1 open, 6 confirmatory, 1 resolved
- Section 3.1: 5 confirmatory
- Section 3.3: 1 open, 2 confirmatory
- Section 3.4: 1 open

Open and Confirmatory Items (continued)

- Section 3.5: 3 open, 1 confirmatory, 1 resolved
- Section 3.6: 1 open, 2 confirmatory
- Section 4.2: 1 open
- Section 4.3: 1 open, 3 confirmatory
- Section 4 4: 1 confirmatory

Applicant Presentation

Mr. Greg Robison
Project Manager
Oconee/McGuire/Catawba License Renewal
Duke Energy Corporation

Chapter 2: Scoping and Screening

- Scoping methodology audit
  - Desktop Review
  - Onsite audit October 15-19, 2001
  - Requests for additional information
  - Findings and conclusions

Chapter 2: Scoping and Screening (continued)

- Unique systems and structures
  - Ice condenser containment
  - Annulus ventilation system
  - Containment air return and hydrogen skimmer system
  - Containment valve injection water system

Chapter 2: Scoping and Screening (continued)

- Staff's review process
  - Updated final safety analysis reports
  - Piping and instrumentation diagrams (P&IDs)
  - License conditions
  - Interim staff guidance (ISGs)
- Focus on out-of-scope systems, structures and components (SSCs)

Chapter 2: Scoping and Screening (continued)

- Scoping results
  - 54 4(a)(1) Safety-related SSCs
  - 54 4(a)(2) Non-safety-related support SSCs
  - 54 4(a)(3) Regulated events (fire protection, ATWS, SBO, PTS and EQ)
- Screening results
  - Passive components
  - Long-lived components and structures

Chapter 2: Scoping and Screening (continued)

- Reactor coolant system
  - Class 1 piping, valves, and pumps
  - Pressurizer
  - Reactor vessel and CRDM pressure boundary
  - Reactor vessel internals
  - Steam generators
- No open items

Chapter 2: Scoping and Screening (continued)

- Engineered safety features
  - Annulus ventilation system
  - Safety injection system
  - Residual heat removal system
  - Containment valve injection water system
- Three open items (apply to auxiliary systems)
  - Fan housings
  - Damper housings
  - Building sealants (structures issue)

Chapter 2: Scoping and Screening (continued)

- Auxiliary systems
  - Ventilation systems
  - Cooling water systems
  - Fire protection systems
  - Diesel systems
  - Waste processing systems

Chapter 2: Scoping and Screening (continued)

- Two open items in fire protection scoping and screening
  - Jockey pumps
  - Manual suppression in potential fire exposure areas
- Nine confirmatory items
  - Fire protection scoping and screening (4)
  - Replacement of flexible connectors and hoses (4)
  - Replacement of nitrogen bottles (1)

Chapter 2: Scoping and Screening (continued)

- Steam and power conversion systems
  - Auxiliary feedwater system
  - Main steam system
  - Main feedwater system
  - Condensate system
- No open items

Chapter 2: Scoping and Screening (continued)

- Structures
  - Reactor buildings
  - Other structures
  - Component supports
- No open items

Chapter 2: Scoping and Screening (continued)

- Results for electrical, instrumentation and controls
  - Passive electrical and I&C components
  - Out-of-scope components
  - Components subject to replacement
- Confirmatory item pertaining to offsite power path for SBO recovery

Chapter 3: Aging Management Programs (AMPs)

- Review process
  - Standard Review Plan for License Renewal
  - Ten attributes are evaluated
  - Conference calls
  - Requests for additional information

Chapter 3: AMPs (continued)

- Existing, Augmented and New AMPs
  - 30 existing programs
  - 5 augmented programs
  - 13 new programs
    - 8 one-time inspections

Chapter 3: AMPs (continued)

- New AMPs
  - Alloy-600 Aging Management Review
  - Borated Water Systems Stainless Steel Inspection*
  - CRDM and Other Vessel Closure Penetrations Inspection Program
  - Galvanic Susceptibility Inspection*
  - Inaccessible Non-EQ Medium-voltage Cables AMP
  - Liquid Waste System Inspection*
  - Non-EQ Insulated Cables and Connections AMP

* one-time inspection

Chapter 3: AMPs (continued)

- New AMPs (continued)
  - Reactor Vessel Internals Inspection
  - Selective Leaching Inspection*
  - Sump Pump Systems Inspection*
  - Treated Water Systems Stainless Steel Inspection*
  - Waste Gas Systems Inspection*
  - Pressurizer Spray Head Examination**

* one-time inspection
** AMP not in LRA

Chapter 3: AMPs (continued)

- SER Section 3 0 Common AMPs
  - Chemistry Control Program
  - Containment Leak Rate Testing Program
  - Condenser Circulating Water System Internal Coating Inspection
  - Fluid Leak Management Program
  - Galvanic Susceptibility Inspection
  - Flow-accelerated Corrosion Program
  - Service Water Piping Corrosion Program
  - Selective Leaching Inspection

Chapter 3: AMPs (continued)

- One open item for common AMPs
  - ISI-Volumetric examination of Class-1 small-bore pipe
- Six confirmatory items for common AMPs
  - ISI-RCS piping weld material (V C. Summer event)
  - Heat Exchanger PM acceptance criteria
  - Service Water Piping Corrosion Program and detection of localized corrosion
  - FSAR supplements for 3 AMPs need to reference governing TS, standards or guidelines
- Resolved - Condenser Circulating Water Internal Coating Inspection

Chapter 3: AMR Results (continued)

- Staff's review process
  - Materials, environments and aging effects
  - All applicable aging effects were identified
  - Aging effects listed were appropriate
  - Reasonable assurance that intended functions will be maintained consistent with CLB in renewal period

Chapter 3: AMR Results (continued)

- Section 3.1 Reactor Coolant System
  - Class 1 piping, valves, and pumps
  - Pressurizer
  - Reactor vessel and CRDM pressure boundary
  - Reactor vessel internals
  - Steam generators

Chapter 3: AMR Results (continued)

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

Chapter 3: AMR Results (continued)

- Materials
  - Carbon steel
  - Stainless steel
    - Cast austenitic stainless steel
    - Precipitation-hardened steel for bolts
  - Inconel alloys
    - Alloy 600
    - Alloy 82/182

Chapter 3: AMR Results (continued)

- Environments
  - Borated reactor coolant
  - Reactor building air
  - Steam

Chapter 3: AMR Results (continued)

- Aging effects
  - Cracking
  - Loss of material
  - Reduced fracture toughness
  - Loss of preload
  - Dimensional changes

Chapter 3: AMR Results (continued)

- Common AMPs
  - Chemistry control program
  - Inservice inspection plan
  - Fluid leak monitoring program
  - Flow-accelerated corrosion

Chapter 3: AMR Results (continued)

- RCS-specific AMPs
  - Alloy-600 Aging Management Review
  - Pressurizer spray head examination
  - Reactor vessel integrity program
  - CRDM and other vessel closure penetrations inspection program
  - BMI thimble tube inspection program
  - RV internals inspection program
  - Steam generator surveillance program

Chapter 3: AMR Results (continued)

- Five confirmatory items in Section 3.1
  - VT-1 examination of pressurizer spray head will detect tight cracks
  - Rx Vessel Integrity Surveillance capsule table will be updated
  - VHP Nozzle Program and commitment (under Alloy-600 AMR) to incorporate potential new requirements
  - RVI Inspection will be performed on McGuire 1 and 2 on a staggered basis
  - FSAR supplement for SG Surveillance program will reference NEI 97-06, "Steam Generator Program Guidelines"

Chapter 3: AMR Results (continued)

- Section 3.2 Engineered Safety Features (8)
  - Safety injection system
  - Residual heat removal system
  - Refueling water system
  - Containment spray system
  - Containment isolation system

Chapter 3: AMR Results (continued)

- Section 3.2 Engineered Safety Features
  - All applicable aging effects were identified
  - Aging effects listed were appropriate
  - Reasonable assurance that intended functions will be maintained consistent with CLB in renewal period
  - No open or confirmatory items

Chapter 3: AMR Results (continued)

- Section 3.3 Auxiliary Systems (38)
  - Diesel engine systems
  - Ventilation systems
  - Cooling water systems
  - Waste processing systems

Chapter 3: AMR Results (continued)

- One open item in SER Section 3.3
  - Condenser circulating water system: no aging effects specified for rubber expansion joint in yard
- Two confirmatory items in SER Section 3.3
  - EDG starting air system: aging effects specified for carbon steel starting air distributor filter in sheltered environment
  - Standby shutdown system diesel HX: fouling identified as an aging effect for copper tubing in treated water environment

Chapter 3: AMR Results (continued)

- Section 3.4 Steam and Power Conversion Systems (9)
  - Condensate storage system
  - Auxiliary feedwater system
  - Main feedwater system
  - Main steam system
- Open item pertaining to one-time inspection of auxiliary feedwater system components

Chapter 3: AMR Results (continued)

- Section 3.5 Containments, Structures and Component Supports
  - Reactor building
  - Other structures
  - Component supports
- Three open items were identified

Chapter 3: AMR Results (continued)

- SER Section 3.5 open items
  - Aging of concrete structures
  - No aging effects specified for inaccessible concrete ice condenser structural components
- SER Section 3.5 resolved item
  - Environment for below-grade concrete

Chapter 3: AMR Results (continued)

- Section 3.6 Electrical and Instrumentation and Controls
  - Aging effects caused by heat and radiation
    - Embrittlement, cracking, melting, discoloration and swelling of insulation for cables and connections
  - Aging management program
    - Non-EQ Insulated Cables and Connections Inspection Program

Chapter 3: AMR Results (continued)

- Section 3 6 Electrical and Instrumentation and Controls
  - Open item
    - Sensitivity of high-range radiation and neutron monitoring instrumentation cables to insulation resistance
  - Confirmatory Item
    - FSAR supplement to be revised to indicate that the potential for moisture in the area of degradation will be considered

Chapter 3: AMR Results (continued)

- Section 3.6 Electrical and Instrumentation and Controls (continued)
  - Aging effects caused by moisture and voltage stress for inaccessible medium-voltage cables
    - Formation of water trees and localized damage
  - Aging management program
    - Inaccessible Non-EQ Medium Voltage Cables Aging Management Program

Chapter 3: AMR Results (continued)

- Section 3.6 Electrical and Instrumentation and Controls (continued)
  - Confirmatory item to update FSAR supplement to eliminate reference to "significant moisture"
  - Additional information needed pertaining to the quality of the test

Chapter 3: AMR Results (continued)

- Section 3.6 Electrical and Instrumentation and Controls
  - Aging effects caused by boric acid ingress into connector pins
    - Corrosion
  - Aging management program
    - Fluid Leak management Program
  - No open items

Chapter 4: Time-limited Aging Analyses (TLAAs)

- Overview of TLAAs
  - Reactor vessel neutron embrittlement
  - Metal fatigue
  - Environmental qualification of electrical equipment
  - Containment liner plate, metal containments, and penetration fatigue analysis

Chapter 4: TLAAs (continued)

- Overview of TLAAs (continued)
  - Reactor coolant pump flywheel fatigue
  - Leak-before-break analysis
  - Depletion of nuclear service water pond volume due to runoff
- Open and confirmatory items
  - Neutron embrittlement
  - Thermal fatigue and underclad cracking
  - EQ Program and GSI-168

Chapter 4: TLAAs (continued)

- Section 4.2 Reactor vessel neutron embrittlement
  - Pressurized thermal shock (PTS)
  - Upper shelf energy (USE)
  - Pressure-temperature (PT) limits

Chapter 4: TLAAs (continued)

- Application provided USE and PTS values
- Staff performed independent calculations
- Open item 4.2-1 (not in SER) to address recent test results for surveillance capsule (McGuire 1)
- Conclusions

Chapter 4: TLAAs (continued)

- Section 4.3 Metal Fatigue
  - Thermal Fatigue Management Program (TFMP)
  - Westinghouse topical report applicant action items
  - Evaluation of environmental fatigue
  - Evaluation of underclad cracking

Chapter 4: TLAAs (continued)

- Section 4.3 Open Items
  - Evaluation of pressurizer sub-components
  - Evaluation of environmental fatigue effects
  - Underclad cracking concern with McGuire 1
  - FSAR supplement

Chapter 4: TLAAs (continued)

- Section 4.7 Leak-before-break (LBB) Analysis
  - WCAP-10585 (McGuire 1 and 2)
  - WCAP-10546 (Catawba 1 and 2)
- Considerations for LBB Analysis
  - Accumulation of fatigue transient cycles
  - Thermal aging (WCAP-10456)
- Staff Conclusions

Concluding Remarks

- Focus on open and confirmatory items
- Duke to respond to SER open items October 28, 2002
- Hearing process continues
- Issue Final SER January 6, 2003

SUBCOMMITTEE CHAIRMAN OPENING STATEMENT
LICENSE RENEWAL SUBCOMMITTEE MEETING
MCGUIRE AND CATAWBA
OCTOBER 8, 2002

Good morning. This is the meeting of the ACRS Subcommittee on Plant License Renewal. I am Mario Bonaca, Chairman of the Subcommittee.

The ACRS Members in attendance are Graham Leitch, Peter Ford, Dana Powers, and Steve Rosen.

The purpose of this meeting is to review the staff's Safety Evaluation Report, with open items, related to the application for renewal of the operating licenses for McGuire Nuclear Station Units 1 and 2 and Catawba Nuclear Station Units 1and 2.

The Subcommittee will gather information, analyze relevant issues and facts, and formulate the proposed positions and actions, as appropriate, for deliberation by the full Committee.

Tim Kobetz is the Cognizant ACRS staff engineer for this meeting. The rules for participation in today's meeting have been announced as part of the notice of this meeting previously noticed in the Federal Register on September 23rd, 2002. A transcript of this meeting is being kept and will be made available as stated in the Federal Register Notice.

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

I would like to point out that copies of this presentation are in the back of the room. In addition, copies of the McGuire and Catawba license renewal application is also available for reference in the back of the room.

We have received no requests for time to make oral statements or written comments from members of the public regarding today's meeting. (if comments/statements received they should be presented/read now and then make the following statement: The staff will address these concerns as part of today's presentation.)

We will now proceed with the meeting. I call upon Mr. P. T. Kuo, Program Director for the NRC Division of License Renewal and Environmental Impacts, for opening remarks.