

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

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

16 MR. MEDOFF: That's correct.

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

19 MEMBER POWERS: You were just hoping that
20 it was.

21 MR. MEDOFF: I would have to check.

22 CHAIRMAN BONACA: That is robust.

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

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

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

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

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

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

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1 limit, I believe.

2 CHAIRMAN BONACA: Yeah.

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

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

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

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

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

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

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

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

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

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

6 MS. FRANOVICH: Right.

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

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

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

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

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

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

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

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

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

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

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

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1 outage. So I would expect that --

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

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

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

16 MEMBER LEITCH: Okay. Thanks.

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

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

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

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

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

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

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

12 MR. MEDOFF: Where are you now?

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

15 MR. MEDOFF: The CRDM program?

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

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

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

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

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

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

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

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

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

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

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

19 CHAIRMAN BONACA: Okay.

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

22 CHAIRMAN BONACA: Thank you.

23 MR. MEDOFF: Moving on --

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

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1 they in the so-called cold head?

2 MS. HAZELTINE: It's the cold head.

3 MEMBER LEITCH: The cold head.

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

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

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

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

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

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

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

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

6 When we had our discussions with the
7 applicant in September, they pointed out some
8 differences in the RV internal designs. The applicant
9 has preferred one additional unit for these
10 inspections, McGuire 2, and based on the differences
11 in designs, we think that the inspections at McGuire
12 1 and 2, as well as previous inspections at all three
13 Oconee units should provide relevant data as to
14 whether they need to schedule further inspections at
15 Catawba 1 and 2.

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

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

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

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

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

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

12 MR. MEDOFF: Yes. We --

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

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

18 MEMBER FORD: Okay.

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

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

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

25 MEMBER FORD: Yeah, 3.145. Okay.

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

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

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

16 MEMBER FORD: Okay.

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

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

23 MS. FRANOVICH: Domestic operating
24 experience. Right.

25 MR. HISER: This is Allen Hiser of EMCB.

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

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

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

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

25 MR. MEDOFF: Thank you.

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

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

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

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

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

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

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

23 MEMBER POWERS: That's enough.

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

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

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

11 MEMBER POWERS: That's enough.

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

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

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

22 CHAIRMAN BONACA: No.

23 MR. ROBINSON: Okay.

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

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

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

7 CHAIRMAN BONACA: Right.

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

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

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

3 MR. SEMMLER: Mid-90s.

4 MS. FRANOVICH: Mid-90s.

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

8 MS. FRANOVICH: Okay. Thank you, Mike.

9 MR. SEMMLER: Thank you.

10 MS. FRANOVICH: Any other questions on the
11 open item, or the two confirmatory items in Section
12 3.3? Okay. We'll go on to 3.4.

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

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

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1 effectiveness of the chemistry control programs.

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

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

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

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

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

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1 do inspections.

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

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

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

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

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

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

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

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

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

11 MR. JENG: Yes.

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

15 MR. JENG: Yes. As a matter of fact, the
16 Staff has established a position of defining what
17 would constitute aggressive elements which would form
18 the concern. Three criteria. One is the pH value,
19 and the way that you see the pH value is to stay about
20 5.5. Second is the fluoride content, which we
21 maintain should no exceed 500 PPM. And the third is
22 the one you mentioned, sulfate attack, and we are
23 maintaining should not exceed 1,500 PPM. So the
24 applicant in this particular case will submit their
25 long duration testing data which has shown the datas

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1 way below these rates.

2 MEMBER POWERS: Do you not include
3 phosphate in there?

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

6 MEMBER POWERS: Okay. And sulfate is also
7 1,500 PPM.

8 MR. JENG: No, Chloride.

9 MEMBER POWERS: Chloride.

10 MR. JENG: Yeah, 500 PPM.

11 MEMBER POWERS: Sulfate is not an
12 attacker?

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

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

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

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

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1 data and parameters that we used to evaluate this
2 issue.

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

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

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

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

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

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1 MEMBER ROSEN: Today.

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

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

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

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

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

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

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

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

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

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

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

19 MR. JENG: No.

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

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

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

10 MEMBER POWERS: Everybody in America uses
11 those same criteria.

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

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

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

22 MEMBER POWERS: Decrepitation.

23 MEMBER FORD: Decrepitation.

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

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

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

18 MEMBER POWERS: You have to get to it
19 first.

20 MEMBER FORD: I recognize that.

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

23 MEMBER FORD: Yeah.

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

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

6 MEMBER FORD: Yeah. Thank you.

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

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

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

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

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

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

18 MS. KEISER: No, we do not.

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

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1 think that was what you were talking about, not the
2 100 year geological time.

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

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

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

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

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

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

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

25 Staff also has a confirmatory item with

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

6 Are there any questions about this open
7 item?

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

11 MR. SHEMANSKI: GSI-168.

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

14 MR. SHEMANSKI: No, not really.

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

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

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

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

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

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1 sensitive way of detecting cable degradation.

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

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

24 MEMBER LEITCH: Okay. Thank you.

25 MEMBER POWERS: Do we have an experiential

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

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

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

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

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

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

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

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

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

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

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

12 We don't have any trouble with their
13 response, but we are certainly not going to have GSI-
14 168 resolved by November 1st. We are working on it.

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

17 MR. SHEMANSKI: Right. Basically, on GSI-
18 168 we received the technical assessment from the
19 Office of Research. It has been sent over to NRR, and
20 we are presently developing a draft of the research,
21 technical assessment. We have a draft summary, and we
22 are going to issue it as a generic communication
23 probably within the next several months.

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

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

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

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

12 MEMBER LEITCH: Okay. Thank you.

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

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

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

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

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

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

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1 cables.

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

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

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

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1 specifically, the Staff is satisfied with ten years.

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

4 CHAIRMAN BONACA: Yeah, well not for each
5 site.

6 MS. FRANOVICH: I think for each site.

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

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

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

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

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1 thing they did for Oconee. Right?

2 MR. SHEMANSKI: Yes.

3 CHAIRMAN BONACA: You accepted those
4 positions for Oconee.

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

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

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

25 MS. FRANOVICH: Okay.

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

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

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

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

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

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

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

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

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

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

8 PARTICIPANT: Jai is here.

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

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

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

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

23 MS. FRANOVICH: Okay.

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

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

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

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

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

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

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

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

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

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1 reactor during its license periods.

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

10 Since the 10 CFR Part 54 requires you to
11 do your review of the application consistent with the
12 current licensing basis for the plant, we didn't see
13 any reason to change that process. What will happen
14 is the Applicant will submit the PT limits for the
15 extended periods of operation prior to entering into
16 them. The Staff will review them appropriately
17 through the regulatory process that's consistent with
18 10 CFR 50.90.

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

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

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

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

25 Going on with the independent assessments,

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

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

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

15 MEMBER ROSEN: Yes. It goes a long way.

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

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

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

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

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

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

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

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1 MR. MEDOFF: Actually, the way we handle
2 the vessel materials is the Staff always encourages
3 them to use surveillance data if they are available
4 for the heat of material in question. Not all of the
5 materials in the reactor vessel are represented in the
6 reactor vessel surveillance programs for the plants.
7 They may be represented in some programs for sister
8 plants where we then encourage them to use sister
9 data. If you use the tables to establish the RTPTS,
10 you might get a different value than you get for the -
11 -

12 MEMBER FORD: Surveillance status.

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

16 MEMBER FORD: But they are averaging about
17 70 degrees F difference between their surveillance
18 data, the 10 CFR 50.61 color collisions on the
19 average, about 70 degrees higher.

20 MR. MEDOFF: Than when using the tables.

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

25 MR. MEDOFF: No. Actually what the rule

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

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

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

17 MEMBER FORD: Go for it.

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

25 If you can meet that criteria, then you

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

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

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

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

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

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

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

25 MR. ELLIOT: But also, the issue here that

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1 affects this is --

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

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

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

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

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

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

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

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

22 MS. FRANOVICH: I understand.

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

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1 I could not compare table to table.

2 MS. FRANOVICH: Right.

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

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

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

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

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1 McGuire 2 and either of the Catawba units.

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

5 MEMBER POWERS: In the criteria, there's
6 50.

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

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

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

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

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

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

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

14 MEMBER ROSEN: It's not the groundwater.

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

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

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

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

6 MR. MEDOFF: Right.

7 MS. FRANOVICH: Any questions on the USE
8 and PTS TLAA's?

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

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

14 CHAIRMAN BONACA: Okay.

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

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

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

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

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

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

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

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

25 The third major area we looked at was

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

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

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

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

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

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

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

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

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

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

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

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

10 MS. FRANOVICH: But before you can turn it
11 over to Barry, I just wanted to indicate that for
12 these Section 4.3 open items the only one that remains
13 open at this point is the underclad cracking concern.
14 That's with regard to McGuire 2. I believe the
15 handout indicates McGuire 1, but it's really a McGuire
16 2 concern.

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

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

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1 Chemical Engineering Branch.

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

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

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

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1 Any questions?

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

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

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

25 Let me address the thermal aging effect

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

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

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

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

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

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

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

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

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

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

17 MS. FRANOVICH: Would you --

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

22 MEMBER ROSEN: Thank you.

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

25 MS. FRANOVICH: Described in your UFSAR

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1 today.

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

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

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

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

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1 MS. FRANOVICH: Thank you for the
2 opportunity.

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

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

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

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

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

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

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

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

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

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

11 CHAIRMAN BONACA: Thank you. Steve.

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

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

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

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

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

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

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

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

20 CHAIRMAN BONACA: Thank you, Steve.
21 Graham.

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

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1 very nicely. It made it very understandable and
2 logical.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

7 CHAIRMAN BONACA: Sure.

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

9 CHAIRMAN BONACA: Dana.

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

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

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

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

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

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

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

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

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1 the rule.

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

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

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

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

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

17 MEMBER ROSEN: Them too.

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

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

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

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

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

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

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

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

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

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

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

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1 a bit of time running around about nothing.

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

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

14 MR. KUO: Dr. Bonaca, just one thing that
15 we are looking at with the schedule. Originally for
16 uncontested application or in the schedule it is 25
17 months. Actually, this plant's schedule is issued as
18 25 months, but since then we got the SRM from
19 Commission that shortened this schedule from 25 to 22
20 months. In their rationale, they say in the schedule
21 you saved us three months for us to make our decision.

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

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

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

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

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

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

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

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

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

22 MS. FRANOVICH: I'd be delighted.

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

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1 Committee discussions too because some new things come
2 up.

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

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

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

10 PARTICIPANT: It is right after lunch.

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

13 MEMBER POWERS: Will you be on the record?

14 CHAIRMAN BONACA: Yes.

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

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

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

22

23

24

25

CERTIFICATE

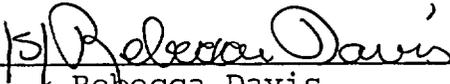
This is to certify that the attached proceedings before the United States Nuclear Regulatory Commission in the matter of:

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

Docket Number: N/A

Location: Rockville, Maryland

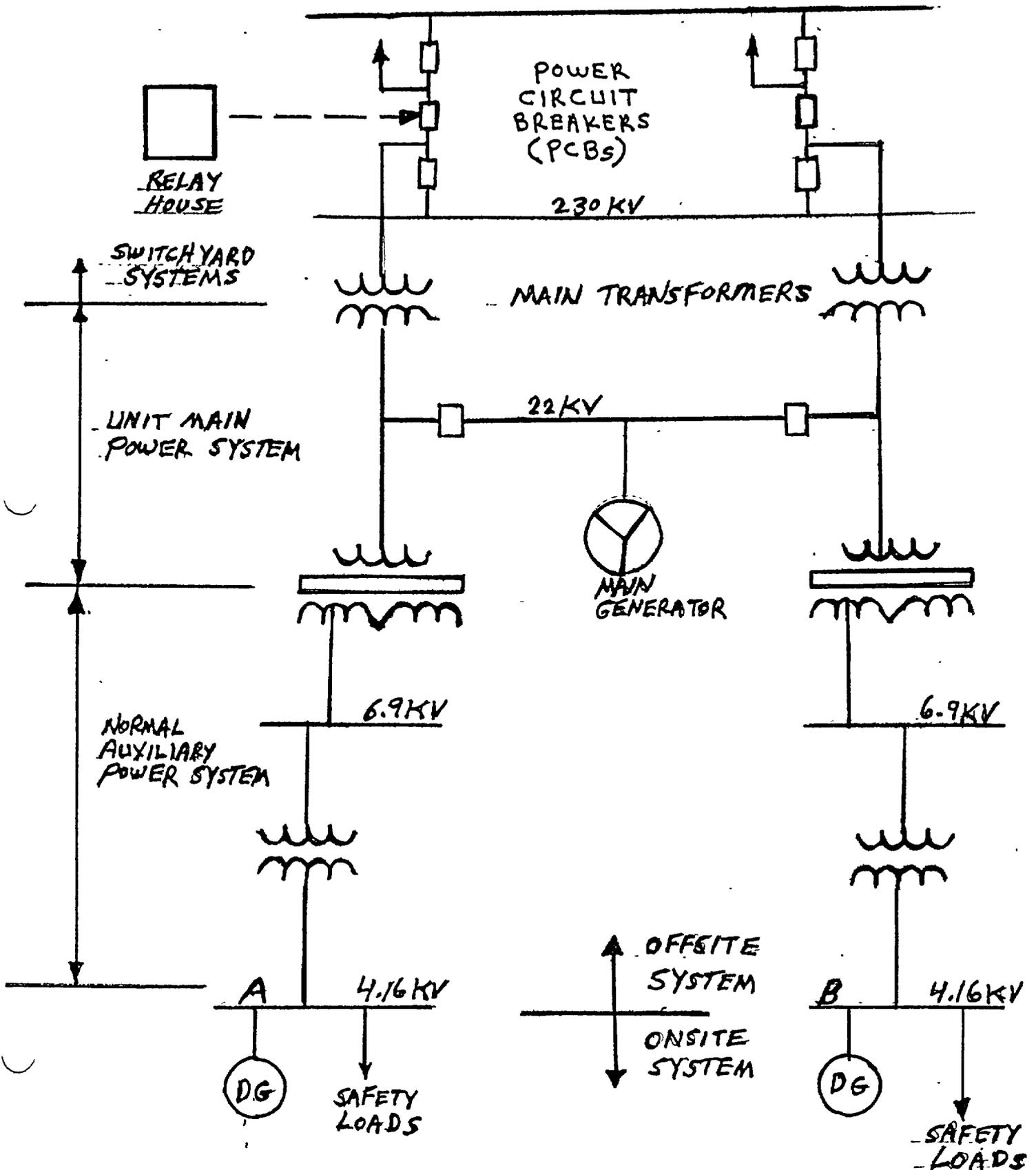
were held as herein appears, and that this is the original transcript thereof for the file of the United States Nuclear Regulatory Commission taken by me and, thereafter reduced to typewriting by me or under the direction of the court reporting company, and that the transcript is a true and accurate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



Rebecca Davis
Official Reporter
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SBO POWER RECOVERY PATH



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

<u>MNS Preop (8/21/62-9/11/81)</u>	<u>pH</u>	<u>Chlorides</u>	<u>Sulphate</u>
Sample size	12525	1453	0
<u>Mean</u>	<u>6.64</u>	<u>4.14 ppm</u>	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
<u>Mean</u>	<u>6.58</u>	<u>5.40 ppm</u>	<u>5.52 ppm</u>
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
<u>Mean</u>	<u>6.80</u>	<u>7.45 ppm</u>	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
<u>Mean</u>	<u>6.90</u>	<u>12.66 ppm</u>	<u>8.10 ppm</u>
Min.	5.90	3.30 ppm	4.70 ppm
Max.	8.90	28.00 ppm	10.20 ppm

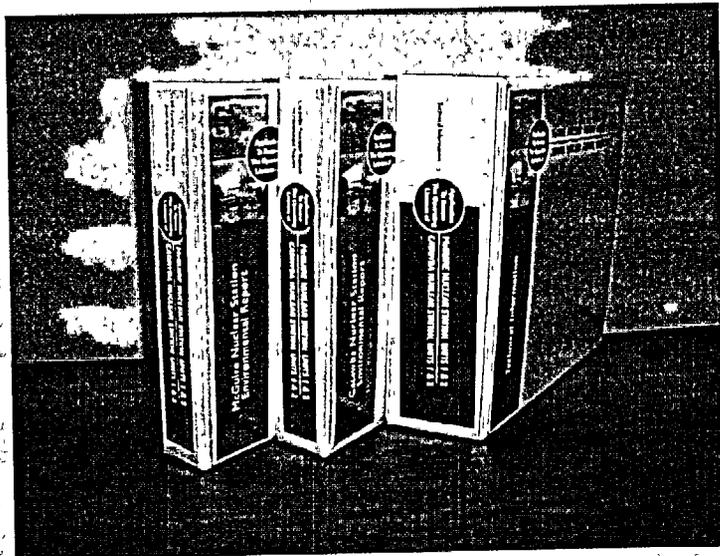
<u>Acceptable Limits</u>	<u>>5.50</u>	<u>500 ppm</u>	<u>1500 ppm</u>
---------------------------------	------------------------	-----------------------	------------------------

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

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



McGuire – Catawba License Renewal



Presentation to:

**Advisory Committee on
Reactor Safeguards
Plant License Renewal
Subcommittee**

October 8, 2002



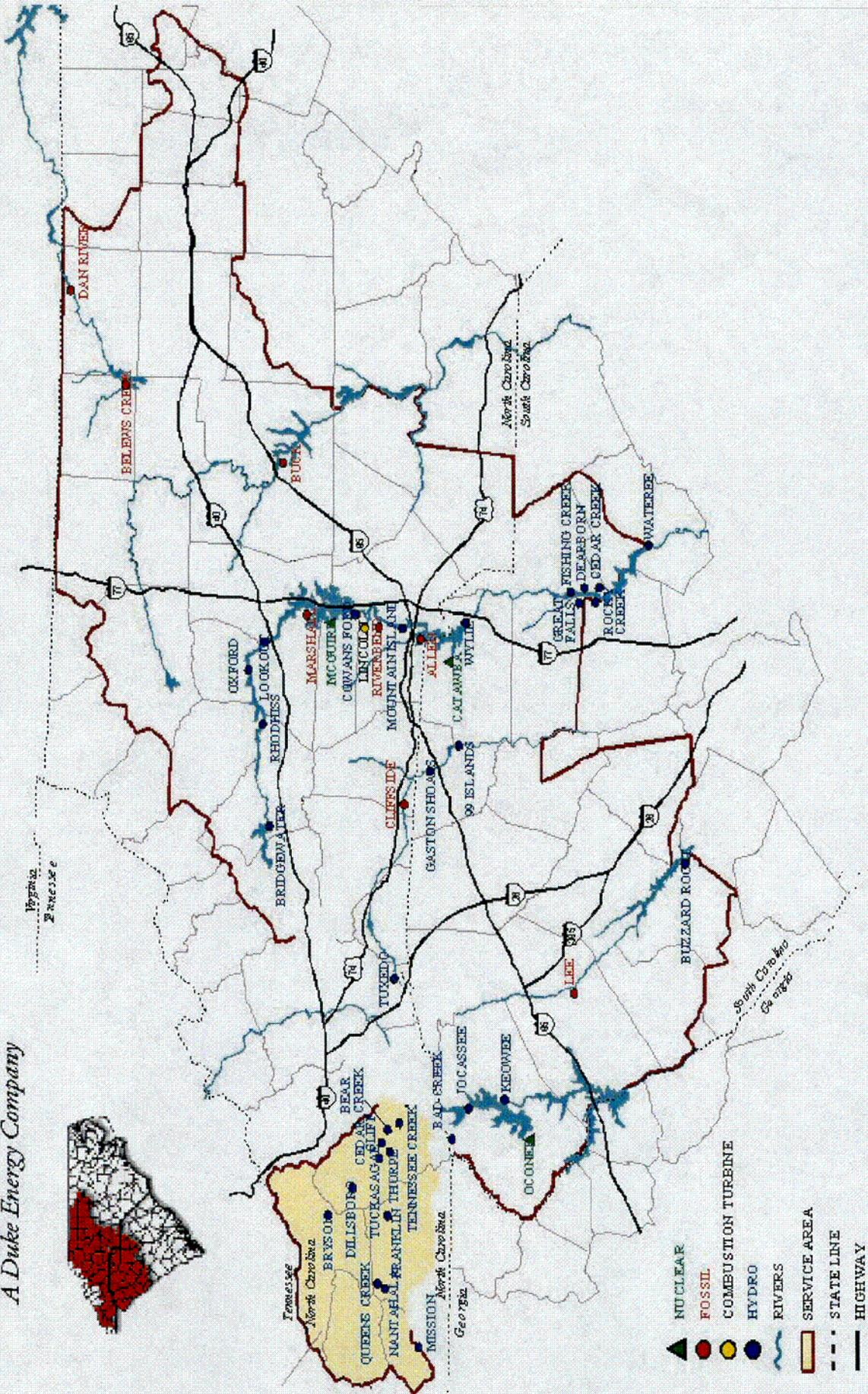
Duke Renewal Team

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



A Duke Energy Company

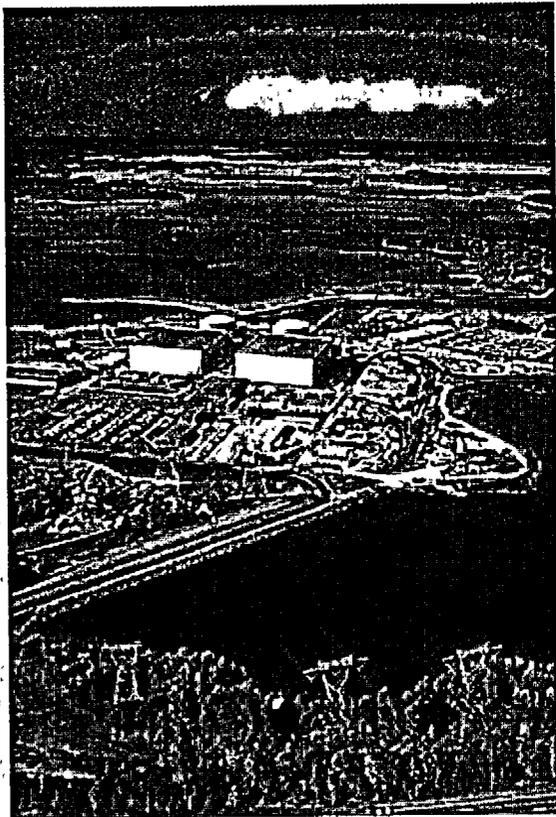
DUKE POWER GENERATING SYSTEM



- ▲ NUCLEAR
- FOSSIL
- COMBUSTION TURBINE
- HYDRO
- ~ RIVERS
- ▭ SERVICE AREA
- - - STATE LINE
- HIGHWAY

October 8, 2002

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**McGuire Nuclear Station
Huntersville, North Carolina**

October 8, 2002



**Catawba Nuclear Station
York, South Carolina**



Plant Description

McGuire

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

Catawba

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

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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

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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

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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

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8



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

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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

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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

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Aging Management Review Methodology

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

Component
+Aging Effect
+Program
+Demonstration
Reasonable Assurance

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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

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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

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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%)

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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

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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

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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*

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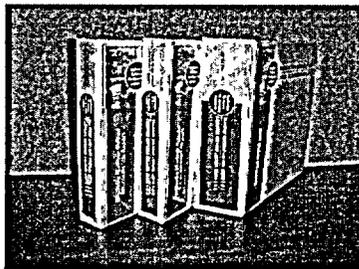


Site Implementation

- 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*

October 8, 2002

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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

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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

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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

October 4, 2009 4



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

October 4, 2009 3



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

October 4, 2009 4



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.

October 4, 2002

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Hearings

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

October 4, 2002

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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)

October 4, 2002

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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

October 8, 2002 10



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

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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

October 8, 2002 12



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

October 4, 2007

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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**

October 2, 2007

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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**

October 4, 2007

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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 TLAAAs
- › 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

October 8, 2002 16



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

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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

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Applicant Presentation

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

October 4, 2001

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Chapter 2: Scoping and Screening

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

October 4, 2001

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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

October 4, 2001

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Chapter 2: Scoping and Screening (continued)

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

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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

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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

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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)

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Chapter 2: Scoping and Screening (continued)

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

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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)

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**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

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**Chapter 2: Scoping and Screening
(continued)**

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

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**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

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Chapter 3: Aging Management Programs (AMPs)

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

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Chapter 3: AMPs (continued)

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

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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

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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

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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

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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

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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

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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

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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

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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

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Chapter 3: AMR Results (continued)

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

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Chapter 3: AMR Results (continued)

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

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Chapter 3: AMR Results (continued)

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

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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

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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"

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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

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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

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Chapter 3: AMR Results (continued)

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

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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

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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

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Chapter 3: AMR Results (continued)

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

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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

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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

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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

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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

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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

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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

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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

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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

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Chapter 4: TLAAs (continued)

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

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Chapter 4: TLAAAs (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

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Chapter 4: TLAAAs (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

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Chapter 4: TLAAAs (continued)

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

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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

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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

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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 1 and 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.