DR. FORD: Your contention is that some of those programs exist to address this.

MR. ELLIOT: Yes, that's true. But here is our baffle bolt person.

MR. GEORGIEV: Actually, I did find it in the SER. We did talk about that baffle bolts.

MR. GRUBELICH: With regard to the -- Frank Grubelich, Mechanical Engineering Branch, NRR.

With regard to the baffle bolts, the baffle bolts on the Westinghouse plants -- they were first -- I think, as you all know, the cracking was discovered over in the foreign plants, and initially what was said -- what was told here is that we've never seen it domestically.

Of course, we've never seen it domestically, because the inspection is visual, and the crack in the bolt was between the shank of the bolt and the head of the bolt. Visually, when you look at it, all you are doing is looking head onto the head of the bolt.

Westinghouse and the Owner's Group then got into doing UT inspections.

DR. SIEBER: Through the head.

MR. GRUBELICH: Through the head.

DR. SIEBER: Right. I remember that.

MR. GRUBELICH: And out of the four plants that they inspected, they found cracking in two of the plants. They have developed an analytical program in which they went back and they looked at what the stress levels were. In that, they developed an inspection program for which they go in and inspect the bolts, and they replace a certain pattern of bolts. And out of the something like 1,000 bolts, they really only need for the blowdown loads, and that's essentially what the program is -- they need some very small portion of those bolts.

They have identified the patterns of the minimum bolting that they need, and they have gone in and in those plants that they inspected, they replaced those bolts.

The MRP is developing an inspection program, and that is what the industry utilities have committed to, that they are in fact going to comply with the inspection requirements, the type of inspection, and what minimum number of bolts have to be replaced.

DR. SIEBER: Now if you replace the minimum number of bolts, that allows the blowdown loads to be --

MR. GRUBELICH: To meet the blowdown load,

is what I'm saying.

DR. SIEBER: To meet the blowdown load, but it doesn't necessarily keep the baffles straight. So you end up with baffle --

MR. GRUBELICH: Well, if you don't put in all the bolts, you have a problem of keeping those plates flat so that during refueling, if you have a fuel assembly that bows and the plate bows, you have an operational problem getting that fuel assembly out.

DR. SIEBER: Yes, you do.

MR. GRUBELICH: So no one is -- In all the meetings that I have had, none of the utilities have ever suggested that they were only going to put in the minimum number of bolts.

DR. FORD: So as far as this LRA process is concerned, because North Anna and Surry have committed to following the development within the MRP and NRC, you have approved that particular ANP related to --

DR. SIEBER: Well, this is the same as a number of other current operating issues, I think, which really isn't a part of the license renewal process. Even if you don't renew the license, they still have to comply to continue to operate.

MR. GRUBELICH: Correct.

MR. ELLIOT: That is a current operating problem.

DR. FORD: The only reason why you would know is if there was a physical reason why going for the extra 20 years that the program that MRP are going to come up with and which they would comply with would be physically impossible, like getting to a critical clearance level.

DR. SIEBER: Right, for the vessel.

DR. FORD: Correct.

MR. ELLIOT: There is one other issue, and that is this occurred on the very early plants, and on the early plants the way they were designed, they had what is called downflow in which they introduce the coolant at the top of the baffle and then down, where all the later plants were upflow. In that case --

DR. SIEBER: A lot of the downflow plants converted by drilling holes and putting plugs in.

MR. ELLIOT: Some of them. Not all of them. There are a few that haven't done that.

DR. FORD: Well, let me ask the next question. That approach should be perfectly adequate, provided there wasn't a physical reason why you could not take these programs on for another 20 years and still not reach some physical fluence limitation.

DR. SIEBER: Right.

DR. FORD: That sort of thing can go on as you examine these programs. Did you go through the mental process, well, the MRP program is fine, but there's a limit to the fluence --

MR. ELLIOT: The utilities have committed to do an inspection on the bolts, UT inspection, prior to entering the 20-year extension and, if they find that they've got cracked bolts, of course, they are going to have to --

DR. KUO: The answer to Dr. Ford's question is yes, that we do go through that kind of a mental process.

MR. ELLIOT: I've very carefully gone through this baffle problem.

DR. SIEBER: I presume -- and correct me if I'm wrong -- that it depends on what the fix is. You replace the bolt. Then the new bolt probably is just as good as the original and can probably go 30 years.

If you do something else that falls short of replacing the part, then you have to figure out how long that fix will last. If you don't know the solution yet, then you don't know what analysis to do. But in the baffle bolting problem, I think the

intention is to replace the bolts.

MR. ELLIOT: Correct.

DR. WALLIS: You are having the longest presentation of the day.

MR. GEORGIEV: Ah, I appreciate the interest and the help.

CHAIRMAN LEITCH: Can we move on to pressurizers now?

MR. GEORGIEV: Yes, the pressurizer is the next area. Basically, it's cladded alloy steel, over-welded with stainless steel. As it turned out in one of the pressurizers in Surry, they had a furnace sensitized stainless steel, and that's what is identified as an aging effect, correctly so. But through the fact that there were no problems identified today, basically, the overall conclusion for the pressurizer is that the aging management program for the identified aging effects are adequate to manage the degradation effect.

CHAIRMAN LEITCH: Does this discussion --

MR. GEORGIEV: And again I do have listed in the evaluation each and every aging effect and each and every management problem. But, you know, it would take two days to run through the list.

CHAIRMAN LEITCH: Does the discussion

about pressurizers include the pressurizer surge lines?

MR. GEORGIEV: The surge lines, yes.

CHAIRMAN LEITCH: And what is the issue there? There seemed to be quite a bit of discussion about the pressurizer surge lines and differences between North Anna and Surry. What's the issue there? I wasn't quite sure I understood that.

MR. GEORGIEV: Well, they do have a sensitized three or four stainless steel.

CHAIRMAN LEITCH: In the surge lines?

MR. GEORGIEV: In the surge lines.

CHAIRMAN LEITCH: At both plants?

MR. GEORGIEV: In one of the Surry plants. Basically, it's the sensitized steel. You know, it's susceptible to stress corrosion, cracking. So that the concern is all this, you know, when it will crack,and that's why we do -- It's been considerable discussion about that. But basically, with the exception of this line, the rest is standard material, alloy steel --

CHAIRMAN LEITCH: Standard material being?

MR. GEORGIEV: Alloy steel overlaid with stainless steel, and they do have some cast material above that is specifically were addressed as in

concern with the reduction to aging. But the overall conclusion was that the existing problem -- we'll manage that.

So the bottom line is there is no open items identified with the pressurizers.

DR. WALLIS: In operation, the pressurizer level stays constant or does it cycle?

DR. SIEBER: It stays constant.

DR. WALLIS: How active is the level in the pressurizer in normal operation?

DR. SIEBER: It stays constant. You always have flow in the surge line, because you run some level of heaters in the spray valve.

DR. WALLIS: Yes. What I'm getting at, if you have heaters in the spray and there's a problem, is there some sort of thermal cycling?

DR. SIEBER: It's not thermal cycling, but there's a thermal gradient.

DR. WALLIS: Does that thermal gradient move up and down?

DR. SIEBER; No, but it runs along the length of the surge line.

DR. WALLIS: So there isn't any kind of thermal fatigue problem at the surge line?

DR. SIEBER: No, but if you trip the

plant, there's --

DR. WALLIS: Oh, yes, but you don't do that very often. With the normal cycling, normal operation, there is some sort of cycling.

DR. SIEBER: Yes, but it's small.

MR. GEORGIEV: Okay. The next area, the reactor vessels, and there is a basically difference for the two plants. At North Anna the base material was forged materials weld overlaid with -- 3 or 4 stainless steel, and for the Surry they used plate material welded.

The reactor vessels, as earlier was discussed, they are covered with regulation, Appendix G and Appendix H. Appendix G pertains to fracture toughness, and we do have a screening criteria that we discussed earlier. They do meet -- The applicant went and calculated the fracture toughness for the 60 years and came out that they meet our screening criteria, which is 50 foot pounds at the end of life.

Basically, the existing problem which, of course, the chemistry control problem are listed adequate to manage the identified aging effect.

For the steam generators, steam --

MR. BARTON; In the reactor vessel, where are the nozzles covered? In the ISI program? ISI

covers the nozzles on the vessel?

DR. SIEBER: Some plants have augmented tech specs which require visual inspection.

MR. GEORGIEV: Steam generators are relatively new. They have been replaced at both plants. So the old type steam generator problem like denting the support were not present in this plant, and they do have existing problem for the primary chemistry, the secondary chemistry, and the steam generator inspections, which include, you know, the tube inspections and loose spot and other.

DR. SIEBER: It seems to me that the tubes in the replacement steam generators for Surry were Alloy 600 or 690? Six hundred, I think.

MR. GEORGIEV: I'll let the applicant answer that. I actually don't --

MS. COFFIN: I think Surry was one of the first plants to replace. So I'm sure they have 600 thermally treated.

DR. SIEBER: Right. That's what I thought.

MR. GEORGIEV: Yes. Actually, the first was in the late Seventies.

DR. SIEBER: Well, Turkey Point, I thought, was the first.

MR. GEORGIEV: The Surry, yeah.

DR. SIEBER: Surry was right behind them. North Anna was fairly recent.

MR. GEORGIEV: Yes.

DR. SIEBER: So the Alloy 600 problems don't go away.

MR. CORBIN: It is Alloy 600.

MR. GEORGIEV: Thank you. And basically, the bottom line is through the review, the other preexisting issues are enveloped and addressed into the SER, and those two relatively new issues that this morning was talked about it.

We went with the effort to identify what the story is with North Anna and Surry, and specifically for the nozzle issue which is dealt with in 2001, inspection has been performed. In two of the units, they didn't find any cracks. On the other two units, they did find, and we list the numbers.

They were repaired, and they used a combination of inspection techniques, visual, UT, ERICA, and liquid penetrant to identify these flaws. For the Davis-Besse issue, which is dealt with in 2002-01, it doesn't apply to North Anna. They don't have the same problem.

CHAIRMAN LEITCH: These cracks, were they

through-wall cracks?

MR. GEORGIEV: I believe they weren't. They were just flaws. But the answer is no, they weren't. They were flaws. One, I remember, was a crack which was fabrication -- was existed, but the rest were characterized as flaws that developed through operation.

DR. ROSEN: Now we heard earlier today that they used a tracked vehicle to look around, and it got stuck in the mush. Tell me more about that? Was it ultimately -- That was, obviously, boric acid that came down from above. That was later cleaned up. How did you leave the heads at Surry and North Anna? What is the current condition?

MR. CORBIN: When we left the heads, they had been cleaned, so that we would be able to establish a good baseline for our next inspection. Next time we go in, we expect to see them clean again.

DR. WALLIS: What was cleaned off them?

MR. CORBIN: We cleaned the boric acid off.

DR. WALLIS: And the boric acid came from a leak up in the guide tube somewhere?

MR. CORBIN: Up on the guide tubes. Correct. Conoseal leak.

DR. WALLIS: And it didn't contain oxides of iron in it?

MR. CORBIN: No, not that we were aware of.

DR. WALLIS: Or enough that you were aware of it?

MR. CORBIN: Right.

DR. ROSEN; But there was enough of it to stick the vehicle?

MR. CORBIN: That's correct. Didn't take much, but it was enough. They have since improved the crawler device where it --

DR. WALLIS: Shouldn't you fix those leaks so that there is no boric acid on the head?

MR. CORBIN: Yes, there are no leaks on the head at this time.

DR. WALLIS: No, but I mean it is coming down from above. Fix the leaks up above. It's in a seal in a joint or something?

MR. CORBIN: We have fixed those leaks.

DR. WALLIS: Oh, so there is no leak anymore?

MR. CORBIN: Correct.

DR. SIEBER: It's a welded device.

MR. CORBIN: What wasn't done in the past

when we had a conoseal leak is we repaired the leak. We did the weld repair, but we didn't clean the head. Now we have cleaned the head.

DR. ROSEN: On both plants, both Surry --

MR. CORBIN: All four units.

CHAIRMAN LEITCH: Okay, George, anything else?

MR. GEORGIEV: Well, I can't think of anything that this committee didn't ask.

CHAIRMAN LEITCH: That's good.

DR. WALLIS: I'm sure we could, but we haven't asked it.

CHAIRMAN LEITCH: We are falling a little bit behind schedule, but let's come back at 2:30, have a little recess now, come back at 2:30, and pick up the pace a little bit.

(Whereupon, the foregoing matter went off the record at 2:17 p.m. and went back on the record at 2:31 p.m)

CHAIRMAN LEITCH: Pick up the discussion with the Engineered Safeguard Features. Jim?

MR. MEDOFF: Good afternoon. I am Jim Medoff. I am a Materials Engineer with the Materials and Chemical Engineering Branch of NRR.

I was assigned the task of reviewing the

engineered safety features for the Surry-North Anna application.

The engineered safety features include: The quench spray, fuel pit cooling, recirculation spray, residual heat removal, and safety injection systems.

When we did the review, we reviewed the systems as a commodity group due to similarities in the materials and the environment for the components in the systems.

We did issue four confirmatory type of RAIs with regard to a few of the aging management programs that were proposed and some regarding identification of aging effects for the components.

I need to emphasize that the engineered safety feature materials and environments were similar to those identified in other applications, specifically Oconee and Turkey Point which we used for comparisons, Oconee based on the fact that it is a sister facility for the applicant, Turkey Point because it was the first Westinghouse facility which we issued a safety evaluation report for.

Most of the components in the engineered safety features are carbon steel or stainless steel materials, and they are exposed to either treated

water internal environments, and external controlled air environments.

The applicant answered and resolved all RAIs to the satisfaction of the staff. The applicant proposed acceptable aging management programs to manage the effects of aging in passive engineered safety components within the scope of license renewal.

Answers to the RAIs satisfactorily clarified why the applicant was proposing different aging management programs for some components that seemed to have similar materials of fabrication and operating environmental conditions.

Based on our review, we determined that the applicant's aging management reviews for the North Anna-Surry ESFs were sufficient to identify both the effects of aging for those ESF components within the scope of license renewal, and the aging management programs that will be used to manage the effect of aging that were identified by the applicant.

We did not have any open items or confirmatory items with regard to the engineered safety features.

CHAIRMAN LEITCH: Comments, questions? Okay, thank you, Jim.

MR. LAURON: My name is Carolyn Lauron.

I am a reviewer in the Materials and Chemical Engineering Branch. I am one of four reviewers who reviewed the auxiliary systems. Along with me is Jim Davis, Arnold Lee and John Sau, all of who are not here today.

At any rate, the systems that we reviewed are the auxiliary systems and essentially consisted of primary process systems,the open water system and closed water, air and gas, ventilation and vacuum system, drain and liquid processing systems, vent and gaseous processing systems, and fire protection and supporting systems.

These systems are delineated more specifically in the six-column tables that the applicant provided, and may include portions of piping and/or components that are found in several other systems. For example, the primary process system includes portions that are described in chemical and volume control system, high radiation sampling system, the in-core instrumentation system, refueling purification system, and the sampling system. That's just one example.

So for each of these, you may find descriptions for specific components in other portions of the LRA under scoping and screening. The aging

effects for the various components in each of these systems varies, depending on the material and/or environment combination.

Both internal and external environments were considered, and the staff found appropriate aging management programs discussed earlier this afternoon to be adequate for managing the various aging effects listed in the six-column table.

So we didn't find any open items. If there are specific components you would like to discuss and/or aging effects, we can certainly go through the tables and see if I could find them.

DR. WALLIS: Does ventilation include control room habitability considerations? Does that come under ventilation?

MS. LAURON: I believe so. Let me look real quick. Ventilation -- The ventilation system includes the containment vacuum system, leakage monitoring, secondary vent system, vacuum priming system, and the heat ventilation system.

DR. WALLIS: How would something like control room habitability come in?

MS. LAURON: Control room habitability?

DR. WALLIS: Where would that come in?

MR. CORBIN: Just to come in, yes, control

habitability systems are included.

DR. WALLIS: Under what heading would they be?

MR. CORBIN: They would be under ventilation.

MS. LAURON: The heating and ventilation system? Is that 2.3.3.2.1?

MR. CORBIN: I's heating and ventilation system, but as far as the title right here it's under ventilation and vacuum system, as noted here. The specific system is a heating and ventilation system.

DR. WALLIS: Well, we are talking about aging management.

MS. LAURON; No, we are talking about the aging effects for --

DR. WALLIS: Yes, presumably the seals, whatever it is, that controls air, egress/ingress and everything, to a control room, subject to wear, deterioration.

MR. CORBIN: The actual seals in the walls would have been treated as part of the structural commodities associated with the walls.

DR. WALLIS: So you wouldn't be prepared to answer specific questions about the control ventilation aging management?

MS. LAURON: Program?

DR. WALLIS: Would you be prepared to answer?

MS. LAURON: I don't know anything.

DR. WALLIS: No?

MS. LAURON: No. If you have something specific, I could certainly take that down and come back.

DR. WALLIS: No. I guess our duty is to ask questions, and your job is to answer them. I'm trying to find a question I can ask.

MS. LAURON: I have no life lines present.

CHAIRMAN LEITCH: Well, I have one. There was some discussion with previous applicants regarding the housings of fans. That is, the fan rotating assembly and ventilation system is obviously an active component, but there was a differentiation made between the fan rotating assembly and the fan housing.

The fan housing -- In some of these critical systems like control room ventilation, is the fan housing in scope?

MS. LAURON: I believe they are. They are in scope.

DR. KUO: I believe fan housing is part of the passive system that the staff is looking at.

CHAIRMAN LEITCH: Okay.

DR. WALLIS: How does How does a fan housing age?

CHAIRMAN LEITCH: Well, it can get holes in it. It can --

DR. SIEBER: It gets corroded. It rusts through. The same way with the ductwork. It vibrates and --

DR. WALLIS: It's a humid -- It's a wet environment or something? Why does it corrode?

MR. BARTON: Environment. It's usually outside. Fans are usually outside.

DR. WALLIS: Oh, those kind of fans. Okay. So it's the weather that gets after them.

MR. BARTON; They are in the table. The fan housings are included in the table.

CHAIRMAN LEITCH: Okay. Any other questions for Carolyn?

DR. WALLIS: Well, I guess Carolyn is telling us that you reviewed these, and everything is fine.

MS. LAURON: Yes. There were no --

DR. WALLIS: Our job is to find out whether we believe you.

MS. LAURON: Right.

DR. WALLIS: So how can I ask a question that helps me. Well, maybe I can't. Maybe I just have to give up.

MR. BARTON; In the fire protection table, there are four sets of things listed, and some of them require aging management. Some don't. I can understand where some are in an air or gas environment but may not require aging management. There are other things in the table that are in an air environment that do have an aging management program.

So I don't understand the rationale here on the fire protection tanks.

MS. LAURON: Okay. For those tanks that are carbon steel and low alloy steel, those are given either -- They are coupled with fire protection program and the tank inspection activity. I believe the tank you are referring to is the stainless steel tank.

MR. BARTON: It's carbon steel, and that's in table 3.3.9.1 on page 3.2.3.3. of the LRA.

MS. LAURON: Is that North Anna or Surry?

MR. BARTON: North Anna Station, Units 1 and 2. Right. There are four sets of tanks listed, and they are all carbon steel and low alloy steel. Some of them in air and gas environment. So aging

effects requiring management are none. I guess I can understand that.

But there are other tanks in that column that are in an air environment that do have a loss of material concern and are under the program. I don't understand why. It's not consistent. For some in air environment, no program required. Some in air environment, a program is required. What's the difference?

MS. LAURON: The difference is the amount of humidity present in that air environment, and each of the environments have a --

MR. BARTON: E or I?

MS. LAURON: Superscript. There should be a superscript, a 1 or a 2, that is defined later. I'm looking at the Surry table, and mine has a 1 listed. It either talks about a moisture or an intermittent wet environment.

MR. BARTON: I don't see that. Okay. All right. Well, if that's the difference, I understand it.

CHAIRMAN LEITCH: Anything else on auxiliary systems? Okay, thank you, Carolyn.

MS. LAURON: thank you.

CHAIRMAN LEITCH: Okay, George, steam and

power conversion systems.

MR. BARTON: Make it quicker this time, George.

MR. GEORGIEV: My name is George Georgiev, and I was assigned to report the steam and power conversion systems.

Steam and power conversion systems for this application includes seven systems: Auxiliary steam; blowdown; condensate; feedwater; main steam; steam drains; and steam generator water treatment.

Aging effects that were identified with those systems were cracking of carbon steel, low alloy steel, stainless steel, in treated water and steam environment, cracking of nickel based alloy and copper alloys in air, loss of materials from carbon steel and low alloy steel in treated water materials.

The application proposes ten different aging management programs to manage the aging effects, and those ten aging management programs are augmented and services station activities; boric acid, corrosion surveillance program; chemistry control program for primary systems; chemistry control program for secondary systems; general condition monitoring activities; infrequently accessed area station activities; ISI program component; components of post-

inspection; secondary piping and component inspections, and that is the flaw accelerated production treatment for this plant; tank inspection activities; and the work control processes.

As you can see from this, some are newly identified problems, like the tank inspection activities earlier. There were some considerable discussion about the new problems.

We reviewed the problems and reviewed the aging management effects, and the materials basically are carbon steel and stainless steel, and you do have some nickel based alloys for the instrumentation end of it, like flaw monitors and some brass and copper alloys.

In our judgment, the aging management programs are adequate to manage the effects for the proposed extended period of time.

DR. WALLIS: Where do the steam drains com from?

MR. GEORGIEV: The steam drains. That's a system question. I would have to look it up. They are identified in the table 3.4.2 for steam drains, but basically it's only one item, pipe.

DR. WALLIS: Where does it come from? Where does it go to?

MR. GEORGIEV: I don't know, sir.

MR. CORBIN: They go to Con-C system or to condensers.

DR. WALLIS: Whenever you take steam out of somewhere and it condenses, you worry about water hammers. Do they have condensate traps and things like that?

MR. GEORGIEV: Yes,they do.

DR. WALLIS: And is there some way of monitoring whether or not there was a water hammer in this line?

MR. GEORGIEV: Well, they do have three problems listed to manage this piping --

DR. WALLIS; Well, I know. They always have management programs. Do they have some way of knowing whether these lines are subject to water hammer, and if water hammer occurred?

MR. CORBIN: The steam drains that are in the scope here have not been subject to water hammer. If you look for like main steam traps, those have been subject to water hammer but are not in the scope of license renewal. Okay? So here we go with the scoping question again. So we have to look where the boundary is drawn.

DR. WALLIS: But the trap is attached to

a drain? What is this main steam trap attached to?

MR. CORBIN: It's part of steam drains, if you will, but --

DR. WALLIS: So if there were water hammer, it would propagate up the drain from the trap?

MR. CORBIN: No, it would not reach the portion of the system. We have to look -- Steam drains is a huge system. It's all over everywhere. It's an octopus. We are only capturing certain pipe segments of the steam drain system in order to establish a boundary.

Now we are not particularly interested in the steam drain system as a system associated with the scope of licensing renewal.

DR. WALLIS: This boundary is because you have drawn a boundary -- because you've got some systems in it, which you know you have to worry about.

MR. CORBIN: Main steam.

DR. WALLIS: And this happens to be inside that boundary, just by chance?

MR. CORBIN: Correct. It's a pipe spool, but it doesn't reach to other portions of steam drains where we have had some experience with water hammer types of issues.

DR. SIEBER: I guess an example is that

you all have a pot and drain line and a trap with a valve on either end, maybe going to the condenser; and when you heat up a steam line, which is a sort of precarious situation, you use a bypass to emit a little bit of steam, which condenses, goes to the trap, and the trap, if it's a bucket trap, will dump into the condenser. And sometimes the water hammer or steam hammer occurs in the main line, sometimes in the drain.

If you would break them off, other than filling the room full of steam, it wouldn't make any difference to the safety of the plant.

DR. WALLIS: I guess I'm just being a naive observer and saying steam drains, aha, water hammer. All he's talked about is cracking, loss of material. Is someone worrying about other causes of damage?

MR. CORBIN: The other --

DR. WALLIS: Apparently, this isn't a concern because, for reasons I don't quite understand, the path where the water hammer might occur is outside the scope.

MR. CORBIN: Water hammer is an event, and as an event driven issue, it's not considered within the scope of license renewal. It may cause damage,

but it's a damage as a result of an event that occurs as opposed to damage as opposed to aging.

DR. WALLIS: But if you have lots of events over a period of time, that causes cumulative damage, which might be even in the scope of aging.

MR. CORBIN: It would be considered as part of the event. It's event driven.

DR. WALLIS: So this would be caught by you tracking down sort of the cause of the event and so on.

MR. CORBIN: That's correct.

DR. WALLIS: So it would be part of some program but not -- It wouldn't fall under the scope of license renewal.

MR. CORBIN: That's correct.

DR. WALLIS: Do you accept that that doesn't fall within the scope of license renewal?

MR. GEORGIEV: Well, our group does not review the scoping. We do the aging effect and materials of the construction and the aging management program for adequacy by identifying management defects.

What we did -- in this case, me -- I looked at the table. One pipe is identified. The external environment is air. The internal is steel.

Those are the problems. They have the aging material, loss of material because it's a carbon steel.

They identified three programs which are managing these aging effects. Water hammer is not listed there. So I assume that this portion of pipe is not an issue.

MS. COFFIN: If I could comment. I think the staff position on water hammer is that it is usually related to a design problem or an operational problem or both, which is not --

DR. WALLIS: It's a what problem? I'm sorry.

MS. COFFIN: A design problem, an operational problem, or both, some kind of configuration control problem. It's not an aging effect brought about in --We don't consider this an aging effect, and we expect the licensees -- Usually, if they have water hammer, want to take care of that issue right away, because it's pretty catastrophic.

DR. WALLIS: Although a succession of water hammers would presumably be an aging effect.

MS. COFFIN: If they decided to live with a system with water hammer, they would have to come in with an aging management program. I have not seen that yet.

DR. WALLIS: Okay. Thank you.

DR. RANSOM: I have a question. Your review reviews whether or not they have a program for aging management in these components, and then you say there are no open items. Does that mean that all of their aging management programs for these components are acceptable?

MR. GEORGIEV: That's what it means, yes.

DR. RANSOM: And satisfied the NRC licensing requirements?

MR. GEORGIEV: Satisfied the staff that they are adequate to manage those effects. That is correct.

DR. RANSOM: Could you give just a brief example on this accelerated corrosion? What does a program consist of?

MR. GEORGIEV: I know they have put a unique name on it. They don't call it flaws with corrosion, but in general terms after we put out the Generic Letter, each and every utility went and came up with a flaws assisted corrosion monitoring program.

We here in headquarters didn't review the program. The regions reviewed the programs for acceptability. and they are not comprehensive. They are going to look at the pipe configuration where they

would have valves, T's, elbows, and they don't look just at welds. They go and take a thickness checks periodically on certain occasions.

DR. RANSOM: What do they check?

MR. GEORGIEV: Well, they -- mainly thickness thinning.

DR. RANSOM: So they measure the thickness?

MR. GEORGIEV: The thickness, to monitor it this way.

DR. RANSOM: Periodically?

MR. GEORGIEV: Periodically.

DR. RANSOM: A couple of times a year?

MR. GEORGIEV: That's correct, and --

CHAIRMAN LEITCH: Do they use the CHECKMATE or CHECKWORKS program?

MR. GEORGIEV: They do. They do.

CHAIRMAN LEITCH: That prescribes the frequency.

MR. GEORGIEV: That prescribes the frequency. That looks in the design, kind of predicting which area you could expect problems and which you can't. Through the years, basically, you know, the experience shows that it's working. We haven't experienced or heard of problems.

DR. FORD: But you say you didn't check CHECKWORKS' validity.

MR. GEORGIEV: I myself, not. But we do have a reviewer who happens to be here, who makes a living out of that. He basically checks the CHECKWORKS. So if you have questions --

MR. PARCZEWSKI: My name is Kris Parczewski. I am in the Material and Chemical Engineering Branch. I understand the question is concerning the degradation due to corrosion problems.

In the steam system, main steam, of course, dry steam does not produce erosion corrosion. So there must be water, you see. All the systems which are prone to erosion corrosion usually should be in the program, erosion corrosion program, which includes prediction of the erosion corrosion and eventual measurement using UT.

So that in this way protects it, if they found, obviously, that they are that degraded, they have to either repair or replace.

DR. RANSOM: I assume it is kind of like the steam turbines that we saw at Watts Bar. You know, they suffer corrosion.

MR. PARCZEWSKI: They do, especially -- yes, extraction steam does that. They are two-phase.

It produces -- Yes, it produces high erosion corrosion degradation. So those lines pretty often have to be replaced.

Generally, they are replacing the -- in most cases, at least -- material which is prone to corrosion, you know, which has a little bit of crumb. You know, one percent of crumb is enough to make it minute on the corrosion.

DR. RANSOM: I guess the steam turbines are really not part of the aging management program, because they are active components, I guess, that are, in effect, repaired periodically.

MR. PARCZEWSKI: That's right.

MR. GEORGIEV: Yes. The turbines does need to be repaired periodically.

DR. ROSEN: So what is the experience at Surry and North Anna in terms of flow accelerated corrosion? I am, obviously, very sensitive to it, given the catastrophic event they had back in the Eighties where actually people were killed. Several people were killed.

DR. RANSOM: Were they the ones who had a steam line --

DR. ROSEN: They were the first place they were opened up, yes. So what's been the experience

since then in terms of managing flow accelerated corrosion?

MR. GEORGIEV: Well, we never heard of any other problems.

DR. ROSEN: There's no corrosion?

MR. GEORGIEV: No, they do. They do. What are the numbers in terms of thickness for certain lines, I can't tell you. For this, the licensee or the applicant has the data.

DR. FORD: I guess our question really is: Surry has had a problem, serious problem. The CHECKWORKS program from EPRI on the books is used to manage the problem. Our question is did you look at the validity of the CHECKWORKS program, i.e., observation versus theory, for Surry and North Anna?

MR. GEORGIEV: I did not.

MR. PARCZEWSKI: I would like to add that the program -- Usually, the programs for the plants are based on EPRI documents. They have a description. They follow pretty closely to this particular program, as described in the document.

DR. ROSEN: I know all about the program, and I know a lot of folks are -- CHECKWORKS. What I'm asking is: At Surry and North Anna, have they had significant flow accelerated corrosion in these

systems and, if so, where has it been?

MR. GEORGIEV: To the best of my knowledge, I don't know --

DR. ROSEN: To the best of your knowledge, you don't know of any?

MR. GEORGIEV: -- of any significant erosion corrosion at Surry or North Anna. But the applicant is here. Maybe they will add to that.

MR. CORBIN: I would add that, you know, we do run the CHECKWORKS program, and we know about the program. We do replace components every refueling outage. There are some number of components that we do discover that are not necessarily below min wall, but where we do not predict that they will go an additional cycle or two and, therefore, we replace those components.

DR. ROSEN: Which systems?

MR. CORBIN: Many of those systems, you would find it on feedwater condensate, extraction steam, which is not up there because it's not on the scope, but those would be the main systems where we would find evidence of flow accelerated corrosion that is causing us to replace components. We do replace components. It's a continuous program.

DR. WALLIS: I think the question that my

colleagues are asking is trying to determine how the NRC staff satisfied itself that these CHECKWORKS and whatever programs were adequate.

DR. KUO: When the program was introduced, we had all these things. Several plants -- I don't really believe Surry was one of them, but naturally, we found in most cases the programs were -- in a proper way. So we felt this is probably -- it's applicable to all the plants.

In addition, all the utilities belong to so called CHECKS program, which is sponsored by EPRI, and they exchange the information among themselves, operating experience.

DR. ROSEN: Well, now we are talking about aging of Surry and North Anna, and what we hear is that there has been lots of changeouts of piping due to flow accelerated corrosion. Can we see some data? How much? Where? Are we dong more and more of this or less and less?

I would think you would be doing less and less, because as a given location turns out to be prone to accelerated corrosion from flow that you would replace it with a material which has got a little chrome in it, and that would then thereafter not be a problem. So over time we would expect to see

this decrease, but there is no data. Data is good. Data might even tell us something.

MR. CORBIN: Our CHECKWORKS program does have all that data, and you're correct. We have a lot of our material with chrome and actually chrome moly material, which is material that is -- and even some stainless material that is less susceptible to erosion corrosion.

A lot of our major -- by major, our large pipe sizes, large bore piping we have replaced with enhanced materials. But we don't rest. It continues. We continue to protect and predict where we may have concerns, and continue to do inspections every outage to validate those concerns.

DR. FORD: That's great news. It's good. What's disturbing is that the NRC don't know that.

MR. CORBIN: In that regard, we do have regional inspections that come in and really evaluate our flow accelerated corrosion program periodically.

DR. ROSEN: Well, maybe when you come back, you can just provide a little data for us.

MR. CORBIN: Certainly.

MR. GEORGIEV: Yes. That data we also would like to see. But I would like to remind the members how it works. You do have a pipe component

that -- design rules. It requires certain wall thickness. So now you have this program which manages the thickness.

As you start approaching this minimum design, if you go below, you will be in noncompliance. You have to come to the Commission for relief. So, basically, there is a safe contained mechanism for us to ascertain --

DR. ROSEN: I am aware of that, George. What I am concerned about is, is the situation getting worse at Surry and North Anna or is it getting better? That is, flow accelerated corrosion corrective actions are precluding recurrence, and that as time goes on we can expect to see fewer and fewer cases of piping that needs replacement due to flow accelerated corrosion. It's a simple question.

MR. GEORGIEV: Acknowledged.

DR. WALLIS: That would really help the public, if the public could be told that, as a result of aging management, something is getting better. Things are getting better, because the impression is that as things get older, they get worse, and it isn't always the case.

MR. CORBIN: Well, we have agreed that we will provide facts. The facts are illuminating, and

I believe we've got that all collected. We'll get an opportunity to put it together. We will certainly submit it to you. I think the facts will tell the story.

MR. GEORGIEV: Well, for power uprates we are very -- you know -- demanding on this issue, because --

DR. ROSEN: Power uprates?

MR. GEORGIEV: For power uprates, yes, we do ask them a question, give us the numbers which are the most susceptible.

DR. WALLIS: We have seen them. We've seen some of dramatic numbers sometimes.

MR. GEORGIEV: For sometime, yes. I imagine that's where the question came from, but for license renewal we haven't really asked these details. Maybe we should.

DR. WALLIS: Well, but for power uprate the concern is that uprating the power you accelerate the rate of flow.

DR. FORD: On that issue, do either of these four -- or any of these four stations plan on going to power uprate?

MR. CORBIN: We are currently looking at the power uprates associated -- Appendix K type power

uprates. Yes.

DR. FORD: Will there be increased flow rates in some of these systems, presumably?

MR. CORBIN: Yes, there will.

DR. FORD: And they will be managed by CHECKWORKS?

MR. CORBIN: That's correct.

CHAIRMAN LEITCH: Okay. Anything else, George? Any other questions?

MR. GEORGIEV: No, sir.

CHAIRMAN LEITCH: Thank you.

MR. MUNSON: For the structures and components support components for the AMR, we contracted out to Brookhaven National Lab, and I was in charge of putting together their final submittal to us.

The components that the applicant did the AMR for were in containment, other structures, NSSS equipment supports, general structural supports, miscellaneous structural commodities, and load-handling cranes and devices.

In the application for the containment, the applicant identified aging effects for steel and elastomers. The applicant did not identify any applicable aging effects for containment concrete

components.

So the staff requested in an REI that the applicant commit to -- the applicant justify their not identifying aging effects for concrete components. So in their response to the staff REI,the applicant committed to managing aging effects for all accessible concrete structural components.

For below grade concrete, the applicant committed to monitoring the groundwater on an annual basis to check for chloride sulfates and pH during --

DR. WALLIS: Is that good enough? Aren't there seasonal variations in groundwater? If you always do it in December, you don't catch -- Maybe there aren't in this area.

MR. MUNSON: I think for the serious type of chemistry that we would expect to actually degrade concrete, I don't think seasonal variations would be significant enough in terms of affecting the pH, chlorides in sulfate.

DR. WALLIS: The salinity? You don't have the New England fall and the leaking of the salinity of the Connecticut River being in August, all the runoff from the salt deposit there on the roads. They are not getting that kind of seasonal variations in Virginia? You don't?

MR. MUNSON: I don't expect --

DR. WALLIS: Acid rain is more prevalent at certain seasons?

MR. MUNSON: And it also would have to get deep below grade. I mean to where these structures are.

DR. WALLIS: I think there might be seasonal variations in the groundwater.

MR. MUNSON: I can check on that.

For structures outside containment, the applicant identified aging effects for steel, concrete in soil and water, elastomers, and soil embankments. Once again, we asked them to justify not having aging effects for all accessible concrete components, and in their response they did commit to managing cracking, loss of material, and change of material properties for concrete components.

For the NSSS equipment supports, general structural supports, and miscellaneous structural commodities, and load-handling cranes and devices, our review -- or, actually, Brookhaven's review showed that the applicant AMR adequately identified the aging effects for each of these components in these structures and systems.

DR. SIEBER: Why isn't a crane considered

an active device?

MR. MUNSON: I think the crane itself -- It is the rails and --

DR. SIEBER: The rail and the hook?

MR. MUNSON: Yes. It's the support for the crane.

DR. SIEBER: I also recall for this class of plants that there was a question maybe 20 years ago about the strength of the bolts that hold the supports for the steam generators.

MR. MUNSON: We had several RAIs on that issue. The applicant has --

DR. SIEBER: So they are doing something special for that?

MR. MUNSON: Right. They have -- They are managing cracking and -- I think cracking and loss of materials -- is that correct? -- for the bolts, NSSS, and they are currently using a VT-3. Is that correct?

DR. SIEBER: Visual?

MR. MUNSON: Visual to identify the cracking. Initially, we felt that might not be adequate, a VT-3, to detect cracking.

DR. SIEBER: Well, the crack occurs in a place where you can't see it. You know, you have a stud coming up out of the floor through the foot of

the support, and you screw a nut down on top of it. The crack is going to be somewhere between the nut and the base mount. So I don't know -- I'm not sure how visual does much for you there.

DR. KUO: That would show up in the loss of loads. If there are cracks in the supports, that would show up in the loss of loads. The load bearing capacity will decrease.

DR. SIEBER: Well, everything in the support is under compression. So it's not going to change shape unless it gets some dynamic load like a blowdown, a LOCA or something like that. I'm not quite sure I understand.

DR. KUO: Because of the crack, the loads carried by the bolt would be less. It's getting loose.

DR. SIEBER: I'll have to think about that. If it's sitting there, it is not going to go anyplace. Does this include snubbers and struts and things like that?

DR. KUO: Scrubbers are active components. We only look at the supports.

DR. SIEBER: That's considered active? But a strut would not be an active component?

DR. KUO: The scrubber itself is active.

The strut, yes. The strut is passive.

DR. SIEBER: It's active?

DR. KUO: No, passive.

DR. SIEBER: Passive? All right. When they started taking out snubbers by seismic recalculation, they would replace some of them with struts. So I presume that the struts are in there.

MR. MUNSON: Are there any further questions on structures?

DR. WALLIS: I was wondering how Brookhaven determines that the AMR adequately identified -- Does Brookhaven make its own list and compare it or do they look at the list and check it off and say we couldn't think of anything else or how do they know that they adequately identified everything that matters?

MR. MUNSON: They use the GALL report for guidance.

DR. WALLIS: And how did the GALL report know? I know the GALL report is immense. This is a combination of everybody's knowledge about what matters in nuclear plants that you have to worry about?

MR. MUNSON: Right. The aging, right.

DR. WALLIS: So Brookhaven made a

comparison between the GALL report --

MR. MUNSON: And the application.

DR. WALLIS: Okay. Thank you.

CHAIRMAN LEITCH: Okay, thank you, Cliff.

MR. MUNSON: Thank you.

MR. LAZEVNICK: Good afternoon. I am Jim Lazevnick from the Electrical Instrumentation Branch of NRR, and I was the reviewer for the electrical and I&C components in the North Anna and Surry application.

CHAIRMAN LEITCH: Sir, could you use the microphone, please.

MR. LAZEVNICK: Yes. I am -- Can you hear me now? I am Jim Lazevnick from the Electrical Instrumentation and Control Branch, and I was the reviewer for the electrical and I&C components in the North Anna and Surry license renewal application.

There were relatively minor license renewal differences between the two plants. I have identified some of them here. The bus duct material: Aluminum bars were used at North Anna, copper bars at Surry; the service environments were slightly different at North Anna and Surry.

The underground cables were different. There was only one safety related cable at North Anna.

There was none at Surry, but there were additional outside power system cables, underground cables, at both plants.

Overhead bare distribution conductors: There was one at Surry. There was none indicated for North Anna.

These differences were all accounted for in the license renewal application and appropriately addressed.

In our review in our draft safety evaluation, we had a number of open items identified which we have more recently discussed with the applicant and have resolved in his draft responses.

The first item dealt with the plant system portion of the off-site power system. That was not originally included in the scope of license renewal.

CHAIRMAN LEITCH: You might want to change your -- Thank you.

MR. LAZEVNICK: Yes. That first open item there is the off-site power system. That was not originally included within the scope of license renewal. We identified a position, final position, in April, indicating that we believed the off-site power system should be included as a result of its reliance under the station blackout rule for recovery from a

station blackout event.

The applicant subsequently included the applicable portion of the off-site power system's structures and components within the scope of license renewal, and the appropriately identified the aging management programs that would have to be included with these structures, systems, and components.

CHAIRMAN LEITCH: Jim, how far out does that off-site power structure go, or how far out -- under boundary there?

DR. ROSEN: Let's have a look at the drawing. We offered the opportunity this morning.

MR. LAZEVNICK: Right. This is the one-line diagram for the Surry power station. What you see there, the lines -- the dotted lines indicate those portions of the electrical circuit that was brought into the scope under the off-site power system station blackout issue.

Basically, what it includes -- In this bottom portion here, we have some transfer buses that are connected to the safety-related buses. A portion of those were included under the original scope, because they dealt with the alternate AC power system portion of the station blackout event, which the licensee did include.

A portion of them were not included, because the were not utilized for that purpose, but they are utilized to bring in your off-site circuit. The circuits go up to the 34.5 KV bus located in the switchyard. So essentially everything between that 345 KV bus and those transfer buses and a portion of the transfer buses are included within the scope.

CHAIRMAN LEITCH: Is it 345 KV?

MR. LAZEVNICK: Yes.

DR. ROSEN; No. It's 34.5.

MR. LAZEVNICK: It's 34.5 KV.

DR. ROSEN: Now you say all the dotted stuff was not included before and is included now. Is that right?

MR. LAZEVNICK: That is correct.

DR. ROSEN: So starting up at the 34.5 bus, why don't you just track down and tell me what those components were?

MR. LAZEVNICK: Okay. Coming down through here, you have a disconnect switch for your circuit breaker. You have a 34.5 KV circuit breaker, another disconnect switch. You have the connections up here to the 34.5 KV bus. I believe those are primarily -- there's some copper or aluminum tubing associated with that.

From the 34.5 KV breaker, you come down to the station service transformers.

DR. ROSEN: Which had not previously been included, but now are? It's a little hard to tell whether those are dotted or not dotted.

MR. LAZEVNICK: Yes. Those are included, but -- They are included within the scope, but they essentially fall out, because they are considered -- Transformers are considered to be an active component. So they ultimately are not included in the scope.

This includes both Class 1-E as well as --

DR. ROSEN: It just sits there, Jack.

DR. SIEBER: It hums, though.

DR. ROSEN: It hums. Oh. Forgot about the hum. That's what makes it active. It sits and goes mmmmmm.

MR. LAZEVNICK: This was an issue addressed generically with the industry prior to license renewal, and this is applicable to all the designs. Transformers are not included, have been determined to be an active component and are not included within the scope of license renewal.

DR. ROSEN: How many cycles? If it's under 30 cycles, it wouldn't be active. Well, forget about it.

MR. LAZEVNICK: From the transformer we go down to the 4 KV circuit breaker and then connect to the transfer buses. So it's that portion of the circuit. The applicant identified various combinations of cabling, solid conductor and underground insulated conductor as portions of the off-site circuit.

DR. ROSEN: Now what about the supports for all of that stuff?

MR. LAZEVNICK: Those are all included. The supports, the structures included with that, cabinets, control wiring. There were about four or five pages of structures identified with that circuit.

MR. BARTON: How about the foundations?

MR. LAZEVNICK: Those were included. The licensee identified four or five pages of structures and included things like switchyard bus, disconnect switch, cross-arms, cable supports, switchyard breaker, circuit breaker supports, caulking and sealants, cable trenches, duct banks, control house slab on grade, control house masonry block walls, control panels, cabinets, control house structural steel, battery racks, manholes, cable pull boxes, electrical conduit, cable trays --

MR. BARTON; We get the picture.

MR. LAZEVNICK: Okay.

DR. ROSEN: I almost get the picture. What about batteries, switchyard batteries?

MR. LAZEVNICK: Battery racks are --

DR. ROSEN: Battery racks. You said that. What about batteries?

MR. LAZEVNICK: Battery racks are included. Batteries have been determined by the staff to be an active component.

DR. ROSEN: Oh, there's that hum.

DR. SIEBER: No, they don't have a hum.

DR. ROSEN: They don't hum. But there's something in the battery that moves?

DR. WALLIS: They pump electrons.

MR. LAZEVNICK: I'll just quickly show the North Anna design. Similar to the Surry design, there were some additional circuits included in that, that weren't included in the Surry design. Basically, it's the same effect there. The dotted lines indicate the portion of the off-site circuit that was scoped in that wasn't originally scoped in.

Again, it's the portion between the 34.5 KV switchyard bus and the transfer buses down in the plant, the 4 KV transfer buses in the plant.

CHAIRMAN LEITCH: Does the generator feed

onto the 34 KV bus? Where is the main generator?

MR. LAZEVNICK: No, it doesn't. The main generator -- Those are -- Yes, the main generator feeds through its own step-up transformer into the switchyard itself, which is rated at --

MR. CORBIN: 500 KV at North Anna.

MR. LAZEVNICK: 500 KV. Thank you. The drawing is extremely small. I can't read it. It generates essentially to the switchyard which is upstream in the 34.5 KV buses. there is another circuit from the 34.5 KV buses that take you through transformers and ultimately connect to the 500 KV switchyard, and it's at that point that the generator is powered.

CHAIRMAN LEITCH: Does the main generator have an auxiliary transformer or a station transformer.

MR. CORBIN: There are station service transformers. You can see in the bottom here, alternate here to normal Charley, alternate to normal Bravo, alternate normal Alpha. Those breakers on the other side of those breakers connect back to station service transformers.

CHAIRMAN LEITCH: Okay. Got you.

DR. SIEBER: You have a blackout diesel

there?

MR. LAZEVNICK; Yes.

DR. SIEBER: So you have five diesels, two per unit plus a blackout diesel?

MR. CORBIN: At North Anna. At Surry there are three diesels plus a blackout diesel.

DR. SIEBER: Okay. With a cross-connect. Right?

MR. LAZEVNICK: That's correct.

MR. CORBIN: That's correct.

DR. SIEBER: Is any part of the blackout diesel in scope?

MR. LAZEVNICK: Yes. The blackout diesels or the alternate AC sources, as we call them, are within scope, and the applicant included those --

DR. SIEBER: Just the switch gear and foundations and things, not the diesel itself?

MR. LAZEVNICK: That's true. That's true. Actually, the diesel itself isn't included, but all the structures and electrical components, cabling associated with that is included.

DR. ROSEN: Very good.

MR. LAZEVNICK: Are those the questions on the station blackout? Should I move on to the next open item here?

The next issue dealt with the disposition of low voltage, low signal level instrumentation circuits. We addressed those as a separate category from other circuits. The guidance in GALL indicates that calibration may be the best way to determine whether there is a problem in those particular circuits, and there has been an ongoing discussion between ourselves and the industry whether visual inspection of these kinds of circuits is sufficient or whether you should include calibration.

Previous applicants used the calibration approach, and that's the approach recommended in the GALL report.

With regard to the low voltage, low signal level instrumentation circuits, we agreed that those particular circuits probably would be acceptable candidates to use a visual inspection approach on, given that the disposition of those circuits, if you visually found some degradation, considered the potential for moisture in the area, the anomalies.

The philosophy there was some amount of cracking could be handled by a cable if it wasn't a dry environment and the cracks were filled with dry air. There was evidence in the literature to indicate that this was the case, but if indeed it was in a

moist environment and those cracks were filled with moist air, then you could get low insulation resistance level cracking and eventual breakdown of the cable.

DR. WALLIS: It becomes moist in a LOCA.

MR. LAZEVNICK: These -- Oh, excuse me. This review I'm speaking about is all non-EQ, all non-environmentally qualified cables. So we are not talking about cables that are in a LOCA environment. These cables are all essentially located in a mild environment.

What we are looking for in these programs are cables that are subject to localized adverse environments, essentially hot spots and the like. The licensee indicated that the general ambient for all these components was acceptable, but we indicated early on in our review that we felt he needed to address localized adverse environments. So these programs are aimed at cables in those kinds of environments.

DR. SIEBER: In general, would you say that low voltage signal cables use voltage levels as the medium, or current?

MR. LAZEVNICK: I think they -- We specifically didn't look at that, but generally they

will use a combination of one or the other, depending upon the transducer and the type of sensing system used.

DR. SIEBER: The current type are better when you consider cable degradation, you know, because the transmitter will continue to put out as much as it needs to, to overcome whatever resistance builds up. But the voltage type is more subject to air.

I think, in this class of plants, most of the transducers are the current types.

MR. CORBIN: We have a lot of 4-20 milliamp circuits.

DR. SIEBER: Yes, right. That's pretty typical for that area.

MR. LAZEVNICK: The next item was kind of a subset of the same category, and it dealt with whether the visual inspection approach was appropriate for high voltage neutron monitoring instrumentation cables and radiation monitor cables.

In looking at the literature on this that was developed for these aging management programs, we found that these cables were looked at separately in terms of the kinds of failures that they produce, because they typically -- the sensors themselves typically operate in the relatively high voltage

range, 1000 volts to 5000 volts.

We felt that these may not be good candidates for the visual inspection, because we felt that at these high voltages and very low signal levels, you could develop leakage currents through the insulation before you could actually see some visual evidence of it. The open item was to address this.

The applicant resolved this issue by essentially relying upon the calibration test, which is consistent with the guidance in the GALL report, to determine whether there -- The applicant utilized calibration tests essentially to determine -- in his aging management program to determine whether there would be any age related degradation of the circuits.

This was consistent with the guidance in the GALL report. So essentially we believe this will resolve that issue.

DR. RANSOM: What does the calibration consist of?

MR. LAZEVNICK: The calibration consists of typically a couple of things, a LOOP calibration as well as a sensor calibration or other --

DR. RANSOM: What do they measure in a calibration?

MR. LAZEVNICK: They are typically looking

at signal levels. They put in a dummy input and look at the signal level of the circuit to determine if, given the input put in, the output is essentially reading where they would expect it to read, and then they will calibrate that to make sure it does indeed do that.

DR. RANSOM: Are those more instrumentation cables you are talking about or what about a bus, for example?

MR. LAZEVNICK: No, no. This whole category is a subset of instrumentation circuits only, and specifically very low signal strength.

DR. RANSOM: Oh, I thought you were talking about like the main buses in the plant.

MR. LAZEVNICK: No, not this particular--

DR. SIEBER: High voltage through the wire.

MR. LAZEVNICK: Yes.

DR. RANSOM: Yes.

MR. LAZEVNICK: Right. Yes, that's perhaps where maybe I misled you. It's high voltage, but it's in an instrumentation circuit. It's kind of an oddball in that sense. It's not high voltage in the sense of a power circuit, but in this case the detectors -- the neutron monitor detectors do operate

at these high voltages.

DR. RANSOM: Oh, yes, I was thinking previously you were talking about the aluminum and copper buses through the plant. Now weren't those the main power buses?

MR. LAZEVNICK: Yes. Those buses are the transfer -- Those are bus ducts.

DR. RANSOM: You mentioned calibration with regard to, you know, the aging management of those components as well.

MR. LAZEVNICK: I didn't think --

DR. RANSOM: I thought.

MR. LAZEVNICK: I don't know how you calibrate that. No, I think I just indicated that these were some differences between the North Anna and Surry design. They are aluminum in one design, copper in the other design, and there were no aging management effects identified that needed to be managed for the extended term for these bus ducts.

DR. RANSOM: Are there no connectors or anything that would degrade with time?

DR. SIEBER: They are typically bolted together.

DR. RANSOM: They are bolted?

DR. SIEBER: Yes, they are.

DR. RANSOM: Well, don't they corrode?

DR. SIEBER: If they corrode, they fail, but you can pick that up with just in normal operation.

DR. RANSOM: But there is no specific program to watch for those sort of effects, I guess, huh?

DR. SIEBER: Some people do.

DR. RANSOM: Thermal vision kind of a program?

DR. SIEBER: They use that thing that looks like a rifle that reads the infrared.

MR. CORBIN: Thermal vision.

CHAIRMAN LEITCH: So you can see those hot spots.

MR. LAZEVNICK: The final open item that we identified in our draft safety evaluation record had to do with the periodic testing of inaccessible medium voltage cables exposed to significant voltage and moisture.

These are essentially underground cables that, if exposed to significant voltage and moisture, could be subject to a water training type of effect that, in the past, is found to cause failure of these particular kinds of circuits.

The issue we had there early on was the definition of, in particular, significant moisture. The guidance in the GALL report indicates that cables that are subject to moisture for more than a few days, for example, normal drain and rain conditions should be considered to be significant moisture.

Early on, we had a lot of discussions about whether they could be subject to moisture for longer periods of time. This item was eventually resolved. The licensee -- As part of that GALL program guidance, part of the prevent actions under the GALL program is to try to keep the moisture off the cables.

If the cables are not subject to moisture, then there are no problems associated with the particular water training effect. So one of the first things the GALL program looked at was, in terms of preventive actions, whether the cables are kept dry. If they are kept dry, then this is really not an issue.

That is primarily the approach the applicant is relying upon in his program. He has sump pumps. He has drains. He has periodic inspections to determine whether he finds any cables in standing water in the manholes and, if he does, he has

indicated as part of his program, if he did find cables in standing water that he determined were subject to moisture for more than a few days, then his disposition of those cables would include testing to determine the amount of degradation on the cables and to ultimately determine the disposition of the cables, whether they needed to be replaced or whether they just simply need to be monitored on a continuing basis.

That type of an approach is also consistent with the guidance under the GALL program, and that would resolve the staff's concern in this area.

DR. ROSEN: So what is the experience in terms of -- at North Anna and Surry, in terms of whether or not these cables in underground vaults, for example, have typically been exposed to standing water or not?

MR. LAZEVNICK: There have been problems identified in the past. The applicant indicated that he has corrected those problems. I think, in some cases, cables have been replaced, and he is now relying upon essentially a condition monitoring and the fixes made to the sump pumps, the drains, etcetera, to keep the cables dry. And if he

determines through his inspections that it is not doing that job, then they will be subject to the testing requirement.

DR. ROSEN: So there is some way that the staff will be able to keep track of whether or not these active components now -- the sump pumps and things like that -- are keeping the cable vaults dry enough so that you don't have to go into a testing program? I mean, because if they don't happen -- if that doesn't happen, then you trip into a testing program.

I'm trying to determine how you would know that the testing program is now required.

MR. LAZEVNICK: Well, the staff doesn't have an ongoing program. There potentially could be audits in the future. We are relying upon the applicant's aging management program. He has indicated in the aging management program that indeed the attributes under that program would indicate that they would be subject to the testing requirements, if they found cables that were exposed to some significant wetting.

CHAIRMAN LEITCH: Just to add to that, I guess, all of the aging management programs that we have will become part of the current licensing basis,

such we will need to maintain the programs and the program elements and the equipment associated with those program elements in a condition to satisfy the requirements of the program. So it will be auditable and inspectable and enforceable.

MR. LAZEVNICK: Is there any other question?

CHAIRMAN LEITCH: Okay, thank you, Jim.

There is no break called for here, but I think we could use one. Why don't we come back at about ten to four. A short break.

(Whereupon, the foregoing matter went off the record at 3:42 p.m. and went back on the record at 3:50 p.m.)

CHAIRMAN LEITCH: Back in session then, and we are on time limited aging analysis.

MR. FAIR: Good afternoon. I am John Fair with Mechanical Engineering Branch, and I have with me Meena Khanna from Materials Engineering, and we are going to go over the time limited aging analyses.

What I have got up here on the first slide is a listing of the time limited aging analysis, same one that the applicant showed earlier. I just want to make one comment on this list. This was the list that was identified by the applicant.

We asked one question on the identification of these time limited aging analyses relative to pipe break criteria, because at North Anna they had used fatigue usage as a criteria for postulating pipe breaks.

The applicant responded to that question by saying that the number of design cycles that they used in the original postulation of pipe break would not be exceeded during the period of extended operations. So we considered this an adequate TLAA, and do consider the pipe break criteria time limited aging analysis when it is based on fatigue usage.

What we are going to do with these is just cover the items that had open items associated with them and what the open items are, discuss what the open items are.

So the first one of these that had open items was the fatigue issue. There were two open items associated with fatigue. One of them involved the evaluation for environmental effects.

What we have done on all license renewal applications is ask applicants to evaluate a sample of components, evaluate it for fatigue for the effects of the new environmental data that wasn't considered in the original design.

The applicant did that evaluation. As part of their evaluation, they at first were intending to use some of the staff's study evaluations that we had done in NUREG-6260. We asked them questions on the applicability of those studies, because the particular items of interest, which were the safety injection and charging nozzles, we had done detailed, finite element analyses in our study analysis, and we wanted to make sure that they had the same type of geometries, etcetera, to make these analyses applicable to Surry and North Anna.

After several rounds of discussion, the applicant decided to go back and actually do detailed analyses for North Anna, because of the differences between their nozzles and the ones in our study NUREG, and they have submitted something later describing this analysis that is satisfactory to the staff.

DR. WALLIS: What kind of environmental fatigue are we talking about here?

MR. FAIR: Well, the effects of the reactor water environment and temperature on fatigue.

DR. WALLIS: It's a thermal fatigue?

MR. FAIR: It's thermal fatigue.

DR. WALLIS: Is it because there's cold water on one side nearby and there's hot water in the

loop?

MR. FAIR: No. This was a generic issue that had been identified a number of years ago. The original ASME code-designed fatigue curves were developed from specimen tests done in air -- in an air environment, and there were adjustment factors of 5 to those to account for the difference between specimen testing and actual components.

Later tests performed in reactor water environments done by the Japanese originally, a lot of the testing, and then later by Argonne National Lab found that maybe these adjustment factors weren't large enough to account for the decrease in fatigue life that you could get in reactor water environments.

So there have been a number of NUREG reports published giving some correlation factors based on the testing in reactor water environments, and the way this has been handled in reviewing these in license renewal is to take the original fatigue analysis and apply some adjustment factor derived from these later correlations, and see if you still have an acceptable usage.

DR. WALLIS: So why is there temperature fluctuation at these nozzles?

MR. FAIR: The transients that cause

fatigue are generally thermal shock type transients when you have a change in flow or something like that.

DR. WALLIS: So it's actually cold water flowing through the nozzle? Doesn't happen very often, does it?

MR. FAIR: It happens every time they get an injection event. I guess there's a number of events in charging systems that occur that give you these --

DR. WALLIS: Particularly charging, safety injection probably less, less frequently.

DR. SIEBER: Yes, pretty much so.

MR. FAIR: The only other open issue in this area was just an updated of the FSAR to describe this environmental evaluation, plus there was also an evaluation done for underclad cracking in which they took credit for a generic evaluation in the Westinghouse topical report.

The only issue was for the applicant to add that into their FSAR update that they were basing it on that topical report, and they agreed to do that.

DR. ROSEN: Before you go away too far from reactor vessel embrittlement, would you just cover it in a flash there?

MR. FAIR: I didn't, but all right.

DR. ROSEN: Earlier our Vice Chairman commented that the license renewal application simply says that there's been an evaluation done, and it will meet Appendix G, the vessel. So the comment was that's nice, but what kind of margin is that.

So have you looked at that?

MS. KHANNA: I'll try to address that. For the RTPTS, we did -- we ensured that they met the 50-61 criteria, and for upper shelf energy -- We don't have the values for RTPTS. I can ask the applicant to provide those values. We actually do not have the values for RTPTS. We do know that they are below -- they fall below the 50-61 screening criteria.

DR. ROSEN: How could you not have the -- How could you know that without having the values?

MS. KHANNA: Basically, like what George has said earlier, you know, that was done through the RCS review, and you know, it was --

DR. ROSEN: If somebody is supposed to meet 50 foot pounds, and you say they meet it, then I say, okay, well, how much was it. But you say we don't know the values. I don't --

MS. KHANNA: Okay. Well, for upper shelf energy for North Anna and Surry, the applicant projected the upper shelf energy using REG GUIDE 1.99

Rev 2. Okay? For North Anna, they found that the upper shelf energy was found above 50 foot pounds, which is in accordance with REG GUIDE 1.99 Rev 2.

DR. ROSEN: And it was?

MS. KHANNA: And that's found acceptable.

DR. ROSEN: And it was above 50 foot pounds, and its value was?

MS. COFFIN: We don't know the specific value. They meet the criteria that's in our regulations, which is to be above 50 foot pounds.

DR. WALLIS: Now this is equivocation, isn't it? What's the real answer?

MS. KHANNA: We don't have-- The real answer is we do not have the values.

DR. WALLIS: So someone told you it's above?

MS. KHANNA: Right, and they used -- What we are doing is we are evaluating it against the criteria of REG GUIDE 1.99 Rev 2, and for Surry it was found to be below, and they used the equivalent margin analyses, which is found acceptable to the code.

Now if we need values, we can get them for you through the applicant. We have already spoken to them and asked them for the values, but they were not asked for previously.

DR. ROSEN: So you accepted their assertion that it was okay?

MS. KHANNA: Yes. The staff did.

MS. COFFIN: If they say under oath and affirmation that they meet our regulations, yes, we agree. We also know there are plants where -- I mean, they cite the right process. We've reviewed the methodology.

There are plants that we pay particular attention to, because we know there are plants that have -- you know, Calvert or Oconee or Palisades, we know they have embrittlement issues, and that's a plant that we might dig a little deeper and ask for a lot more detail and do confirmatory calculations. Do we do it in every case? No.

DR. FORD: But, for instance, Oconee, the RTPTS value is not that high toward the screening value. Whereas, at Surry they are 20 degrees away from the screening criteria for axial cracks, and so here's a situation where the margin, if you like, between the RTPTS value is not that much below the screening criteria for 40 years.

So the question that we are asking is have you done the checking to make sure that, when they say they are all right for 60 years, the values are

reasonable defensible calculations? That's what we are asking.

MS. KHANNA: I understand what you are asking, and that would have been done through the RCS. It was not done, because they did not feel the need to do it. You know, we accepted their word.

DR. WALLIS: Well, I guess the message is that, when you come back, we'd like to see the real numbers.

MS. KHANNA: Okay. That's fine.

DR. ROSEN: For the Appendix G upper shelf entity -- Be sure you know what we are asking -- for all four plants, and the RTPTS value, ductility transition temperature for all four plants. Right, Peter?

DR. FORD: Yes. They are still below the screening criteria at 60 years, and especially for Surry.

DR. SIEBER: At what point do you want this? At what point in time? Sixty years, 40 years?

DR. ROSEN: Sixty years. I mean, that's what they are asking for a license.

DR. WALLIS: If they are close to the criteria, maybe you should let us know how uncertain their predictions are, and what sort of errors you

expect in their prediction.

MS. KHANNA: Okay.

MR. CORBIN: We'll certainly support that effort.

DR. WALLIS: I'm not sure that the fluence is that well calculated, for example. Seems to vary, depending upon the method used, and we get people who say, ah, we've now got a new method for calculating flence, and it's gone down, you know. So that indicates that there is some uncertainty in calculating it.

DR. ROSEN: Well, you know, that's reasonable. I mean, if it doesn't matter -- I mean, if you are so away from the screening criteria --

DR. WALLIS: But they are so far away.

DR. ROSEN: -- then you can do some sort of conservative analysis. But if you are close, yes, you have to do a better job, and there are ways to do a better job.

MR. ELLIOT: This is Barry Elliot. I just want to separate out the two issues first off, the upper shelf energy and the PTS issue. I want to explain to you how we do an evaluation of upper shelf energy.

If a plant is below -- It uses a REG GUIDE

1.99 to determine whether or not they are above and below 50 foot pounds. It's only a screening criteria. If you go below the 50 foot pounds -- We didn't require the applicant to do what's called an equivalent margin analysis. We have generic -- receive generic evaluations from the industry of, if you go certain distance, certain foot pounds below the upper shelf energy, certain foot pound energy.

They have done the analysis generically for all plants, and we know that, as long as you stay above those upper shelf energy evaluations, then you meet the equivalent margin analysis. This plant has done that. They have demonstrated that, and that's all we need to know, as far as the upper shelf energy.

Now as far as the PTS is concerned, I agree. We should have RT. We should have specific values, but I think in this case you are going to see that -- I don't remember this as being one of the plants that's near the screening criteria, but we'll check that and give you that answer. But as far as the upper shelf energy, it is only a screening process which leads to equivalent margin analysis, which then leads to evaluation with respect to generic evaluations, which they have already done.

DR. FORD: And I think Surry is one of

those plants which is not that far off for axial cracks for the screening criteria at 40 years.

MR. CORBIN: Unfortunately, I wish I had a table of all of the information that's just been requested, because it does exist.

DR. FORD: Oh, it does. I've got it here.

MR. CORBIN: But we don't have --

DR. FORD: Surry is 245.

MR. CORBIN: Right. We don't have all of the answers with us here today. I'm not sure the 245 is a 60-year value, though, right?

DR. ROSEN: These are the kind of answers that seems like you ought to just -- All plants all to come in and tell us those answers, so we can build a table up, and we would know what it is we were recommending to the Commission that they approve.

Maybe the staff knows, but we're just dealing with -- Unless we have that, we're just saying, well, the staff told us it's okay. So we said it's okay. If that's what the Commission wants, they want to know whether the staff told us it's okay, that's one thing. But I think they really want more than that.

The Commission wants to know what we think, and unless we have data, we don't think

anything other than what we are told. It's sort of a trivial answer to say we were told this to the Commission.

CHAIRMAN LEITCH: Well, this whole issue is discussed on page 4-4 through about 4-7 of the application, and I guess there are three pieces of information. I'm not sure whether you are saying that we are not going to get the first piece. One is the upper shelf energy. Two is the pressurized thermal shock. Three is the pressure temperature limits.

MR. ELLIOT: I think the applicant in this case has said that they aren't going to give you pressure temperature limits until they need them. What happens is the tech specs --

CHAIRMAN LEITCH: That's true. That's what they did say, yes.

MR. ELLIOT: The tech specs -- We have tech specs for pressure temperature limits, and the tech specs are based upon criteria and methodology which are in the regulations, Appendix G.

What they have said is they will meet the tech specs for how long the current pressure temperature limits are. I'm not sure how long they are, but they update them periodically, and that they will give us before they enter the license renewal

period pressure temperature limits that are applicable for the license renewal period.

That's how we handle tech specs. When the existing tech specs run out, you put new tech specs in and upgrade them, and this is consistent with how we've always done business with tech specs.

CHAIRMAN LEITCH: Okay.

DR. ROSEN: I didn't ask about that.

MR. ELLIOT: Okay. I'm just explaining --

DR. ROSEN: You understand I didn't ask about that.

MR. ELLIOT: I understand you. You want upper shelf energy and pressurized thermal shock.

DR. ROSEN: Right.

MR. CORBIN: We will be happy to provide the information and get that out in front of everyone.

MR. ROSEN: Good. Simple.

MR. FAIR: The next area of the time limited aging analysis we had open items regarding was the containment liner plate analysis, and this is a relatively simple issue.

In the evaluation of this, they did a simple extrapolation of the number of cycles by a factor of 1.5 and specified the number of cycles in the license renewal application.

When we went back and checked the FSARs of the Surry and the North Anna facilities, we found the number of cycles in the Surry facility, but we couldn't find the reference to that number of cycles in the North Anna facility. So what we did was ask them to clarify that as part of the open item, and also to be specific in the FSAR update as to the number of cycles used in the design.

The applicant has come back and said that there was a little confusion in the North Anna FSAR which they intend to update and correct, and that they had done -- for both facilities they had used the same number of conservative cycles and, therefore, their extrapolation for the time limited aging analysis was also a conservative extrapolation.

MS. KHANNA: Okay. 4.7.3 is leak before break. We didn't have any open items. However, there was an item of interest which we have discussed before, which was the summer main coolant loop weld cracking event involving Alloy 82/182 weld material.

Basically, now we -- You know, we've made a note to ourselves that we will always consider the effect of primary water stress corrosion cracking, and we will address it in the SERs for all future leak before break evaluations for license renewal.

I can tell you that for Surry, we noted that they do not have any welds made of Alloy 82/182 material. So this was not a concern. However, for North Anna they do have steam generator primary nozzles to safe end welds in the primary loop piping.

What they have done is they have committed to follow any industry/NRC initiatives, and that will also be done through the MRP. What we have asked them to do and what they have agreed to do is track those through the FSAR Supplement. So they have made a note in their FSAR Supplement, and we will check that through that supplement for North Anna.

CHAIRMAN LEITCH: Okay. Any other comments?

MR. FAIR: That was it. That's the open items.

DR. WALLIS: This MRP gets referred to so often that I hope that they come up with really good results from their studies and recommendations.

CHAIRMAN LEITCH: Okay. Thank you all. I think at this time then we are scheduled to go into a Subcommittee discussion unless there are some other general comments.

I think the status of the SER at the moment is that the SER will be revised, closing these

open items and some other changes to the SER. We need that about a month before we have our full Committee meeting on this topic.

We had hoped that that may occur -- that we may get that by August, mid-August, which would allow us to have a committee -- just sit down with this on the full Committee agenda for September.

It's now not 100 percent clear that we will have that by mid-August. It may slip a little bit. So exactly when this full Committee meeting on this topic will come up is a little unclear. It may still be September. It could be October. We will just have to see how that develops.

I guess I've polled the members who have had to leave for one reason or another, and none of them saw any reason for an interim letter on this topic. I guess I would like to go around the room and ask the members if they see any reason for an interim letter.

Assuming there is not then, I guess what we need to do is to just summarize and clarify the main points that we want to hear about when we come back with the full Committee meeting. In other words, what are those major open items that are still in your mind with respect to the full Committee meeting.

DR. WALLIS: I don't think we need an interim letter, if that is the question.

CHAIRMAN LEITCH: And are there issues --

DR. WALLIS: Do we want to be on the record with all our comments? Should we be on the record or off the record? What's the situation now?

CHAIRMAN LEITCH: I'm not sure what the protocol is.

We don't need this on the record. So we are done with the transcription then.

(Whereupon, the foregoing matter went off the record at 4:12 p.m.)

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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 Reactro Safeguards Plant License Renewal Subcommittee

Docket Number: N/A

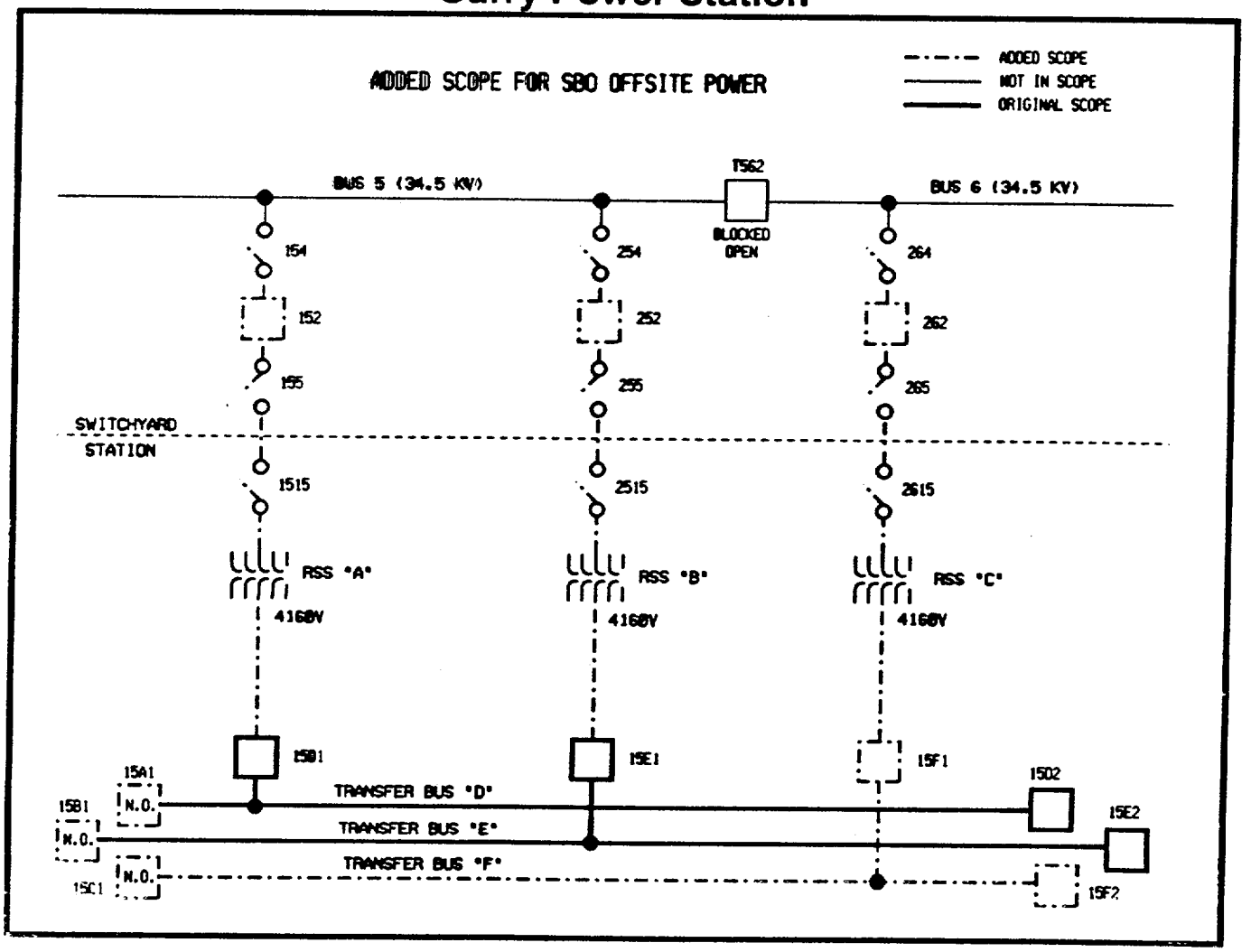
Location: Rockville, Maryland

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

/s/ Debra Wilensky

Debra Wilensky
Official Reporter
Neal R. Gross & Co., Inc.

Figure SPS-1
Surry Power Station



Presentation to

ACRS Subcommittee on
Draft Safety Evaluation Report with Open Items Related to the North Anna and Surry License Renewal Applications

July 9, 2002

Omid Tabatabai, Project Manager
License Renewal and Environmental Impacts Program
Office of Nuclear Reactor Regulation (NRR)

Agenda

Opening Remarks	G. Leitch, ACRS
Staff Introduction	P.T. Kuo, NRR
Overview	O. Tabatabai, NRR
Applicant Presentation	W. Corbin, VEPCO
Scoping and Screening	Chang Li, G. Galletti, NRR
Aging Management Programs	M. Khanna, C. Munson, NRR
Reactor Coolant System	G. Georgiev, NRR
Engineered Safety Features	J. Medoff, NRR

Auxiliary Systems	**C. Lauron, NRR**
Steam and Power Conversion Systems	**G. Georgiev, NRR**
Structures and Components Supports	**C. Munson, NRR**
Electrical and I&C Components	**J. Lazevnick, NRR**
Time-limited Aging Analyses	**J. Fair, M. Khanna, NRR**
ACRS Subcommittee Discussion	**G. Leitch**

OVERVIEW

(Omid Tabatabai)

- Applications Submitted on May 29, 2001
- NAPS 1/2 Located in Louise County in N. Virginia. Units 1 and 2 Operating Licenses Will Expire on 4/1/18 and 8/21/20, Respectively. Each Designed for 2,893 MW Thermal Output
- SPS 1/2 Located in Surry County in S. Virginia. Units 1 and 2 Operating Licenses Will Expire on 5/25/12 and 1/29/13, Respectively. Each Designed for 2,546 MW Thermal Output
- All 4 Units Are 3-loop Westinghouse-designed PWRs

Milestone	Schedule Date	Actual Date
Receive Dominion Joint LRA	05/29/01	05/29/01
Application is accessible	06/15/01	06/15/01
FRN published for receipt & acceptability review	06/28/01	06/28/01
Press Release describing FRN	06/29/01	06/29/01
FRN published describing acceptance and opportunity for hearing	07/27/01	07/27/01
Letter to applicant forwarding FRN and schedule	07/27/01	07/30/01
Press Release describing FRN	07/30/01	07/27/01
FRN published for Intent/Env Scoping mtg (Surry)	08/15/01	08/15/01
Deadline for Filing Hearing Requests and Petitions for Intervention	08/27/01	08/27/01
FRN published for Intent/Env Scoping mtg (North Anna)	09/05/01	09/05/01
Scoping and Screening Methodology Audits Complete	09/14/01	09/14/01
Environmental Scoping Meeting (Surry)	09/19/01	09/19/01
EIS Scoping Period Ends (Surry)	10/15/01	10/15/01
Environmental Scoping Meeting (North Anna)	10/18/01	10/18/02
EIS Scoping Period Ends (North Anna)	11/05/01	11/05/01
Env. RAIs Issued to Applicant (Surry)	11/09/01	10/17/01
Safety RAIs issued by RLEP	11/26/01	11/26/01
Env. RAIs Issued to Applicant (North Anna)	12/07/01	10/17/01
Env. RAIs Responses Issued to NRC (Surry)	12/21/01	12/10/01
Env. RAIs Responses Issued to NRC (North Anna)	01/21/02	12/10/01
Responses to Safety RAIs received	02/08/02	02/05/02
Scoping Inspections Complete	02/15/02	02/08/02
Draft SEIS to EPA, Issue Notice of Availability (Surry)	04/26/02	04/25/02
Draft SEIS to EPA, Issue Notice of Availability (North Anna)	05/17/02	05/08/02
AMR Inspections Complete (N. Anna & Surry)	05/31/02	05/1702
Public Meeting to Discuss DEIS (Surry)	06/06/02	05/29/02
SER w/OI issued by RLEP	06/10/02	06/06/02
Public Meeting to Discuss DEIS (North Anna)	06/25/02	06/25/02
ACRS Subcommittee of SER w/OI	07/09/02	07/09/02
End of DEIS Comment Period (Surry)	07/18/02	
End of DEIS Comment Period (North Anna)	08/08/02	
Responses to SER OI received	08/22/02	
ACRS Full committee of SER w/OI	09/12/02	
SER issued by RLEP	11/05/02	
Optional Final Inspection complete	11/29/02	
ACRS of full committee of SER	12/05/02	
Final SEIS issued to EPA/Issue Notice of Availability (Surry)	12/13/02	
Final SEIS issued to EPA/Issue Notice of Availability (North Anna)	12/13/02	
ACRS Letter	12/13/02	
Regional Administrator's Letter	01/20/03	
SER issued as NUREG	01/28/03	
Commission Paper W/Staff Recommendations	03/29/03	
Commission Decision	07/04/03	

(Omid Tabatabai)

NRC Staff's Draft Safety Evaluation Report Format

- Chapter 1: Introduction - General Discussion
- Chapter 2: Scoping and Screening
- Chapter 3: Aging Management Programs/review Results
- Chapter 4: Time-limited Aging Analyses (TLAAs)

Open Items

(Omid Tabatabai)

- The NRC Staff Initially Identified Eight (8) Open Items and 15 Confirmatory Actions in the Draft SER. All have been resolved
- Open and Confirmatory Items and their Resolutions Will be Discussed Later in this Presentation

NRC Inspections (Omid Tabatabai)

- Scoping and Screening (S&S) Audits on September 14, 2001
- Aging Management Review (AMR) Inspection on May 17, 2002
- Overall Material Condition of the Plant Looked Good
- Backup Documentation for S&S Process Was Complete
- Reviewed AMR Supporting Docs for Existing and New AMPs

(Chang Li, Greg Galleti)

Chapter 2: Scoping and Screening of SCs Subject to AMR

2.1: Scoping and Screening Methodology: (Greg Galleti)

- Overview
- On-Site Audit
- Findings
- Conclusions

Open Items: None

2.3: Mechanical Systems (Chang Li)

- Reactor Coolant Systems (5 Systems)
- Engineering Safeguard (5 Systems)
- Auxiliary Systems (38 Systems)
- Steam and Power Conversion Systems (7 Systems)

Open Items: None

2.4: Structures (Chang Li)

- **Containment and 11 other structures**

Open Items: None

3.0: Aging Management Review Results

(Meena Khanna, Cliff Munson)

19 Existing Aging Management Activities:

- Boric Acid Corrosion Surveillance Program
- Chemistry Control Program for Primary Systems
- Chemistry Control Program for Secondary Systems
- Fuel Oil Chemistry Program
- ISI Program - Reactor Vessel Program
- Reactor Vessel Integrity Management Program
- Reactor Vessel Internals Inspection Program
- Steam Generator Inspections Program
- Augmented Inspection Activities
- Battery Rack Inspections
- Civil Engineering Structural Inspection
- Fire Protection Program
- General Condition Monitoring Activities
- Inspection Activities - Load Handling Cranes and Devices
- ISI Program - Component and Component Support Inspections
- ISI Program - Containment Inspection

- **Work Control Process**
- **Service Water System Inspections**
- **Secondary Piping and Component Inspection**

***4 New Aging Management Programs and Activities*:**

- **Buried Piping and Valve Inspection Activities**
- **Infrequently Accessed Area Inspection Activities**
- **Tank Inspection Activities**
- **Non-EQ Cables Activity**

Item of Interest:

- ***Davis-Besse Event in regards to boric acid corrosion of the reactor pressure vessel head.***

  The staff issued Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity." To date, the staff has reviewed the 15-day responses for North Anna and Surry. The staff found that the responses indicate that the conditions found at Davis-Besse are not present at North Anna and Surry.

Open Items: None

3.4: Reactor Coolant Systems (George Georgiev)

- Reactor Coolant Piping
- Reactor Coolant Internals
- Pressurizers
- Steam Generators
- Reactor Vessels

Items of Interest

- AMR results compared to topical reports (WCAP-14574 on Pressurizers, WCAP-14575 on Piping, and WCAP-14577 on Reactor Vessel Internals). The applicant stated that RCS components described in the reports bound the RCS components, with some clarifications, for both North Anna and Surry

(George Georgiev)

- Inspection to address the RPV head penetration cracking issue (NRC bulletin 2001-1) has been completed

- Inspection to address boric acid corrosion of RPV head issue (NRC bulletin 2002-01 has been completed

Open Items: None

3.5: Engineered Safety Features (Jim Medoff)

- Engineered Safety Features (ESFs) Include: Quench Spray (QS), Fuel Pit Cooling (FC), Recirculation Spray (RS), Residual Heat Removal (RH), and Safety Injection Systems (SI).

- ESFs Were Evaluated as a Commodity Group Due to Similarities of the Materials-of-fabrication/environmental Condition Combinations for the Systems.

- Consistent with 10 CFR 54.21(a)(3), the applicant's AMRs for the North Anna/Surry ESFs Were Sufficient to Identify Effects of Aging for the ESF Components Within the Scope of License Renewal and the AMPs That Manage the Effects of Aging.

Open Items: None

3.6: Auxiliary Systems (Carolyn Lauron)

- Primary Process Systems
- Open Water Systems
- Closed Water Systems
- Air and Gas Systems
- Ventilation and Vacuum System
- Drain and Liquid Processing Systems
- Vent and Gaseous Processing Systems
- Fire Protection and Supporting Systems

Open Items: None

(George Georgiev)

3.7: Steam and Power Conversion Systems

Seven Systems:

- **Auxiliary Steam**
- **Blowdown**
- **Condensate**
- **Feedwater**
- **Main Steam**
- **Steam Drains**
- **Steam Generator Water Treatment**

Open Items: None

(Cliff Munson)

3.8: STRUCTURES AND COMPONENTS SUPPORTS

- Containment
- Other Structures
- NSSS Equipment Supports
- General Structural Supports
- Miscellaneous Structural Commodities
- Load-handling Cranes and Devices

- Open Items: None

3.9: Electrical and I&C Components (Jim Lazevnick)

- Relatively Minor License Renewal Differences
  - Bus Duct Materials (e.g., Aluminum Bars at North Anna, Copper Bars at Surry)
  - Maximum Service Environments (E.g., Maximum Cable Operating Temperatures, North Anna, Power 162.5°F, I&C 160°F; Surry, Power 164.1°F, I&C 147.5°F)
  - Underground Cables (e.g., North Anna Service Water Pump Motor Power Cables)
  - Overhead Bare Distribution Conductors (e.g., Surry Offsite Power Circuit Aluminum Overhead Conductor)

Open Items: **(Jim Lazevnick)**

2.5-1: Plant System Portion of Offsite Power System Not Included in Scope of License Renewal

Resolved: Applicant Included Applicable Offsite Power Structures and Components Within the Scope of License Renewal. Appropriate Structures and Components Have Been Included in Aging Management Programs.

3.9.2-1: Disposition of Low Voltage, Low Signal Level Instrumentation Circuits Should Include Potential for Moisture in the Area

Resolved: Aging Management Program Considers the Potential for Moisture in the Area of Any Anomalies.

3.9.2-2: Adequacy of Visual Inspection Versus Calibration Approach for High Voltage Neutron Monitoring Instrumentation Cables and Radiation Monitor Cables

(Jim Lazevnick)

Resolved: Aging Management Program Utilizes Calibration Tests to Identify the Potential Existence of Age-related Degradation in These Circuits.

<u>3.9.2-3:</u> Periodic Testing of Inaccessible Medium Voltage Cables Exposed to Significant Voltage and Moisture

Resolved: Aging Management Program Calls for Testing of Inaccessible Medium Voltage Cables Exposed to Significant Voltage and Moisture.

4.0: Time-limited Aging Analysis (John Fair, Meena Khanna)

4.1: Identification of TLAAs (John Fair)

- Reactor Vessel Neutron Embrittlement
- Metal Fatigue
- Environmental Qualification (EQ) of Electrical Equipment
- Containment Liner Plate Fatigue
- Other Plant-Specific TLAAs
- Crane Load Cycle Limit
- RCP Flywheel Analysis
- Leak-before-break analysis
- Spent Fuel Pool Liner Analysis
- Piping Subsurface Indications
- Reactor Coolant Pump Code Case N-481

4.3: Metal Fatigue (John Fair)

Open Items:

4.3-1: Evaluation of Charging and Safety Injection Nozzles for Environmental Fatigue

4.3-2: Update FSAR Supplement for Environmental Fatigue and Reference WCAP-15338 for TLAA evaluation of underclad cracking

4.6: Containment Liner Plate (John Fair)

Open Items:

4.6-1: Resolve Discrepancy Between FSAR and NAPS LRA Regarding Design Basis Cycles

4.6-2: Update FSAR Supplement to Specify the Number of Cycles Used in the TLAA Evaluation

4.7.3: Leak-Before-Break (LBB) (Meena Khanna)

Items of Interest:

- **Summer main coolant loop weld cracking event involving Alloy 82/182 weld material**

  The staff now considers the effect of primary water stress corrosion cracking (PWSCC) on Alloy 82/182 piping welds for all future LBB evaluations.

Open Items: None

SUBCOMMITTEE CHAIRMAN OPENING STATEMENT
LICENSE RENEWAL SUBCOMMITTEE MEETING
NORTH ANNA AND SURRY
JULY 9, 2002

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

The ACRS Members and consultant in attendance are Mario Bonaca, Peter Ford, Thomas Kress, Victor Ransom, Jack Sieber, Steven Rosen, and John Barton.

The purpose of this meeting is to review the Staff's Safety Evaluation Report with open items related to the application for license renewal of the operating licenses for North Anna Power Station Units 1 and 2 and Surry Power Station Units 1and 2.

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

Tim Kobetz is the Cognizant ACRS Staff engineer for this meeting. Sam Duraiswamy is the Designated Federal Official. 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 June 14th, 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 North Anna and Surry license renewal applications are 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.

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
PLANT LICENSE RENEWAL SUBCOMMITTEE MEETING
NORTH ANNA, UNITS 1 & 2 AND SURRY UNITS, 1 & 2
JULY 9, 2002, ROCKVILLE, MARYLAND

Contact: Tim Kobetz (301-874-3449, tjk1@nrc.gov)

-PROPOSED SCHEDULE-

	Topics	Presenters	Time
I.	Opening Remarks	G. Leitch, ACRS	8:30-8:35 a.m.
II.	Staff Introduction	P. T. Kuo, NRR	8:35-8:45 a.m.
III.	**Overview** of the draft SER Related to License Renewal of North Anna (1 & 2) and Surry (1 & 2)	O. Tabatabai, NRR	8:45-9:45 a.m.
	BREAK		**9:45-10:00 a.m.**
IV.	Virginia Electric and Power Company, Presentation A. Background B. License Renewal Application Scoping and Screening Process (IPA) C. Aging Effects D. Aging Management Programs E. Time Limited Aging Analyzes	W. Corbin	10:00-11:45 a.m.
	LUNCH		**11:45-12:45 p.m.**
V.	**SER Chap. 2:** Scoping and Screening of Structures and Components Subject to an Aging Management Review	G. Galletti, Chang Li	12:45 - 1:15 p.m.
VI.	**SER Chap. 3:** Aging Management Programs	M. Khanna/C. Munson	1:15-1:30 p.m.
	A. Reactor Coolant System	G. Georgiev	1:30-1:45 p.m.
	B. Engineered Safety Features	J. Medoff	1:45-2:00 p.m.
	C. Auxiliary Systems	C. Lauron	2:00-2:15 p.m.
	BREAK		**2:15-2:30 p.m.**
	D. Steam and Power Conversion Systems	G. Georgiev	2:30-2:45 p.m.
	E. Containment, Structures and Component Support	C. Munson	2:45-3:00 p.m.
	F. Electrical Components	J. Lazevnick	3:00-3:20 p.m.

VII.	**SER Chap. 4:** Time Limited Aging Analyses	J. Fair, M. Khanna, S. Saba	3:20-3:40 p.m.
VIII.	Subcommittee Discussion	G. Leitch, ACRS	3:40-4:00 p.m.
IX.	Adjourn		4:00 p.m.

NOTE:

- Presentation time should not exceed 50 percent of the total time allocated for specific item. The remaining 50 percent of the time is reserved for discussion.
- 25 copies of the presentation materials to be provided to the Subcommittee

Advisory Committee on Reactor Safeguards Plant License Renewal Subcommittee Meeting

Surry and North Anna Power Stations, Units 1 and 2

July 9, 2002

Participants

- Dominion
  - Bill Corbin - Director, Nuclear Projects
  - Lucky Wroniewicz - LR Project Manager
  - Mike Henig - LRA Supervisor

Purpose of Meeting

- Provide NRC staff with an overview of the license renewal applications for Surry and North Anna Power Stations
- Report the status of the Draft Safety Evaluation Report Open Items and Confirmatory Actions

Background

- License Renewal Applications submitted May 29, 2001
- Format consistent with NEI 95-10, Revision 3 and NUREG 1800 (SRP), Draft, August 2000
- Class of '01 not expected to use the Draft GALL report

Background

- One License Renewal Application submitted for each station with site specific information identified
- Exemption approved for Electronic Submittal (Adobe® Portable Document Format on CD-ROM)

LRA Format

- Consistent with SRP Draft, August 2000 and NEI 95-10, Revision 3
- Sections discussed today
  - Section 2: Scoping and screening methodology and results
  - Section 3: AMR results - Mechanical, Structural, Electrical
  - Section 4: TLAA methodology and results
  - Appendix A: UFSAR Supplement
  - Appendix B: Aging management activities
  - Appendix C: Aging management review methodology*
  - Appendix E: Environmental Report Supplement

* Reviewers Aid - not required by SRP or NEI 95-10

IPA Process

Defined by 10CFR54.21

1. Identify Systems, Structures, Commodities within scope
2. Identify component groups/structural members/ commodity groups requiring AMR
3. Perform AMR
4. Identify the means to manage the effects of aging

Section 2:
Scoping Methodology

- Used 10CFR54.4 Rule Scoping "Criteria"
  - Criterion 1: safety-related
  - Criterion 2: non-safety-related affecting safety-related
  - Criterion 3: the five regulated events (FP, EQ, PTS, ATWS, SBO)

Section 2:
Scoping Methodology (cont.)

- Documentation Sources
  - Equipment Data System (EDS) - including safety classifications
  - Maintenance Rule Scoping and Civil Engineering Structural Monitoring Program
  - UFSAR, Technical Specifications, Design Basis Documents
  - In-house Scoping Criteria Reports
  - Plant Drawings and Design Documentation

Section 2:
Scoping Results

- Individual Tables for:
  - Systems in scope
  - Systems not in scope
  - Structures in scope
  - Structures not in scope

Section 2:
Screening Methodology

- Mechanical System Screening Overview
  - Reviewed documentation sources to identify intended functions.
  - Used EDS database in conjunction with other documentation sources to identify components supporting these functions.
  - Developed license renewal boundary drawings.

Once this was completed, the passive components within the scope of LR requiring an aging management review were identified.

Section 2:
Screening Methodology (cont.)

- Civil/Structural Screening Overview
  - Reviewed documentation sources to identify intended functions.
  - Used structural detail drawings to identify structural members supporting these functions.

Once this was completed, the passive structural members within the scope of LR requiring an aging management review were identified.

Section 2:
Screening Methodology (cont.)

- Electrical/I&C Screening Overview
  - Passive electrical/I&C components screened on a plant-level basis as commodities
  - Electrical/I&C commodities:
    - Cables and Connectors
    - Electrical Penetrations
    - Bus Ducts

Section 2:
Screening Results

- Each Screening Results Section (Mechanical, Structural, Electrical, I&C)
  - Description
  - UFSAR Reference - hyperlink
  - License Renewal Boundary Drawings* - hyperlink
  - Components Subject to AMR - hyperlink to table

* mechanical systems only

Section 3:
Aging Management Review

- Each AMR Results Section
  - System/Component description reference
  - AMR results tables
  - Generic Topical Report applicability, applicant action item response table if applicable - N/A for structures and electrical, I&C)
  - Materials
  - Environment descriptions
  - Aging effects
  - TLAA (if applicable)
  - Aging management activities

Section 3:
AMR Results

Table 3.1.2-1 Reactor Vessels

Subcomponent	Passive Function	Material Group	Environment	Aging Effects Requiring Management	Aging Management Activity
Bottom Mounted Instrumentation Flux Thimble Tubes	PB	Stainless Steel	(E)Treated Water	Cracking	Chemistry Control Program for Primary Systems
					ISI Program - Reactor Vessel
				Loss of Material	Chemistry Control Program for Primary Systems
					ISI Program - Reactor Vessel
			(I)Air	None	None Required
Bottom Mounted Instrumentation Guide Tubes	PB	Stainless Steel	(E)Air	None	None Required
			(I)Treated Water	Cracking	Chemistry Control Program for Primary Systems
					ISI Program - Reactor Vessel
				Loss of Material	Chemistry Control Program for Primary Systems
					ISI Program - Reactor Vessel
Bottom Head Dome and Torus (and cladding)	PB	Carbon Steel and Low-alloy Steel	(E)Air	Cracking	ISI Program - Reactor Vessel
			(E)Borated Water Leakage	Loss of Material	Boric Acid Corrosion Surveillance
		Stainless Steel	(I)Treated Water	Cracking	Chemistry Control Program for Primary Systems
				Loss of Material	Chemistry Control Program for Primary Systems
Closure Head Dome and Flange (and cladding)	PB	Carbon Steel and Low-alloy Steel	(E)Air	Cracking	ISI Program - Reactor Vessel
			(E)Borated Water Leakage	Loss of Material	ISI Program - Reactor Vessel
		Stainless Steel	(I)Treated Water	Cracking	Chemistry Control Program for Primary Systems
				Loss of Material	Chemistry Control Program for Primary Systems

Section 4:
Time-Limited Aging Analyses Methodology

- Consistent with 10CFR54.21(c) and NEI 95-10
- Key word search of Calculations, Reports, Licensing Correspondence, UFSAR, and WCAPs.

Section 4:
Time-Limited Aging Analyses Results

- Layout consistent with SRP format
- Summarized in Table 4.1-1 showing one of the following criteria are met:

(i) the analyses remains valid for period of extended operation.

(ii) the analyses have been projected to the end of the period of extended operation.

(iii) the effects of aging will be adequately managed for the period of extended operation.

Section 4:
Time-Limited Aging Analyses Results (cont.)

- Generic TLAAs
  - Reactor vessel neutron embrittlement
  - Metal Fatigue (including EAF)
  - Environmental Qualification (EQ)
  - Containment tendon prestresses (not applicable)
  - Containment liner plate and penetration fatigue

Section 4:
Time-Limited Aging Analyses Results (cont.)

- Plant-specific TLAAs
  - Crane load cycle limit
  - RCP flywheel
  - Leak-before-break
  - Spent fuel pool liner
  - Piping subsurface indications
  - RCP - Code Case N-481

Appendix A:
UFSAR Supplement

- This section provides summaries of the programs and activities credited for managing the effects of aging. Each aging management program or activity accomplishes one or more of the four functions, as listed in the Standard Review Plan for License Renewal: Prevention, Mitigation,Condition Monitoring, and Performance Monitoring.

Appendix B:
Aging Management Activities

- Rely on proven techniques established through existing procedures and programs
- AMA format:
  - Aging effects that are managed
  - List of applicable systems, structures and components
  - Activity evaluation in terms of SRP 10 elements

Appendix B:
Aging Management Activities (cont.)

- Existing Activities - 19
  - Chemistry Control - Primary, Secondary, Fuel Oil
  - Inspections - ISI (components/supports, RPV, RVI, Containment), Augmented, SG, Civil Structures, Battery Racks, Cranes, Secondary Components, Service Water System
  - Boric Acid Corrosion Surveillance
  - Fire Protection Program

Appendix B:
Aging Management Activities (cont.)

- Existing Activities - 19 (cont.)
  - General Condition Monitoring*
  - Reactor Vessel Integrity Management
  - Work Control Process*

* enhanced

Appendix B:
Aging Management Activities (cont.)

- New Activities - 4
  - Buried Pipe and Valve Inspections
  - Infrequently Accessed Areas Inspections
  - Tank Inspections
  - Cable Monitoring (added after submittal)

Appendix B:
Aging Management Activities (cont.)

- Operating Experience
  - Industry and in-house operating experience has been incorporated into aging management activities through the corrective action process
  - Operating experience reviews were performed to identify specific aging issues that might apply to structures, systems and components

Appendix B:
Aging Management Activities (cont.)

- Quality Assurance Program elements of corrective action, confirmation process, and administrative controls are applicable to the safety-related and non-safety-related structures, systems, and components within the scope of license renewal.

Appendix B:
Aging Management Activities (cont.)

- TLAA Support Activities
  - Environmental Qualification Program
  - Transient Cycle Counting Program

Appendix B:
Aging Management Activities (cont.)

- Licensee Follow-up Actions
  - listing of actions required in order to effectively manage the aging effects identified through the aging management review
  - includes commitments for program/activity changes and future inspections
  - most intended to be completed before end of current operating license

Future Actions

- A Revised UFSAR Supplement will incorporate Aging Management Activity Summaries (Appendix A), Licensee Follow-up Actions (Appendix B) and SER Confirmatory Action Items

Aging Management Review Methodology - Appendix C

- Not required - Reviewers Aid - Explains:
  - Grouping of systems, structures, and major components - consistent with SRP and NEI 95-10
  - Short-lived components and consumables
  - Aging effects and mechanisms evaluated
- Westinghouse Generic Topical Reports (Class I Piping, RV Internals, Pressurizer, RCS Supports)

Appendix E: Environmental Report

- Environmental Report and Review Process:
  - 10 CFR 54.23 requires a Supplement to the applicant's original ER-OL IAW 10 CFR 51
  - Environmental Review must be performed IAW NEPA
  - Environmental Impacts evaluated IAW NUREG-1437 GEIS ('96, '99)
  - Severe Accident Mitigation Alternatives (SAMAs) were reviewed and results incorporated

Appendix E: Environmental Report

- Environmental Report and Review Process:

  Additional guidance utilized:

  - Supplement 1 to Reg Guide 4.2 (DG-4005)
  - NUREG-1455, Supp.1
  - Previous License Renewal applicants' Environmental Reports

Appendix E: Environmental Report

- Environmental Report and Review Process:
  - Utilized Subject Matter Experts
  - Conducted New & Significant Information identification/assessment process
  - Involved Environmental Agencies, Organizations, and Public
  - Obtained Industry Peer Review
  - Frequent, Clear and Open Communications w/ NRC

Appendix E: Environmental Report

- Environmental Report Results:
  - Environmental Impacts are Small and Smaller Than Reasonable Alternatives

Draft Safety Evaluation Report Status

- 8 Open Items
  - SBO scope (1)
  - Aging management of cables (3)
  - Additional info on EAF (2)
  - Containment liner design cycles (2)
- 15 Confirmatory Actions
  - confirm that UFSAR Supplement updates were performed (13)
  - drawing updates (1)
  - confirmation of open items resolution (1)

Draft Safety Evaluation Report Status

- Submitted to NRC Project Manager for review and concurrence:
  - Response to 8 Open Items
  - Disposition of 15 Confirmatory Actions, including UFSAR Supplements for both Surry and North Anna
- Technical accuracy of draft SER verified and comments will be provided to NRC

Closing Remarks