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NUCLEAR REGULATORY COMMISSION

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MEETING

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

(ACRS)

PLANT LICENSE RENEWAL SUBCOMMITTEE

QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2

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WEDNESDAY

APRIL 14, 2004

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ROCKVILLE, MARYLAND

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The Subcommittee met at the Nuclear Regulatory Commission, Two White Flint North, Room T-2B3, 11545 Rockville Pike, at 12:30 p.m., Graham M. Leitch, Chairman, presiding.

COMMITTEE MEMBERS:

GRAHAM M. LEITCH	Chairman
MARIO V. BONACA	Member
J. PETER FORD	Member
STEPHEN L. ROSEN	Member
WILLIAM J. SHACK	Member

COMMITTEE MEMBERS: (continued)

JOHN D. SIEBER	Member
GRAHAM B. WALLIS	Member
JOHN J. BARTON	ACRS Consultant
MARVIN D. SYKES	ACRS Staff

NRC STAFF PRESENT:

HANS ASHAR
STEWART BAILEY
MAITRI BANERJEE
PEI-YING CHEN
KIMBERLEY CORP
GANESH CHERUVENKI
B. ELLIOT
TANYA FORD
G. GALLETT
MARK HARZZMAN
RAUL HERNANDEZ
JOHN HONCHARIK
NAEEM IQSAL
PETER J. KANH
T.J. KIM
THOMAS KOSHY
P.T. KUO
ARNOLD LEE

NRC STAFF PRESENT: (continued)

SAM LEE

CAROLYN LEWIN

CHANG-YANG LI

Y.C. (RENEE) LI

TILDA LIU

JOHN S. MA

GREG MAKAR

AMAR PAL

PAT PATNAIK

J. RAYAR

ERIC REINHOLT

L. ROSSBACH

DAVID SHUM

JIM STRNISHA

ANGELO STUBBS

RAM SUBBARATKAR

GREGORY SUBER

DAVID TERAO

A. VEGEL

CHENG-JHI WU

I N D E X

P R O C E E D I N G S

Time: 12:28 p.m.

CHAIRMAN LEITCH: Good afternoon. I would like to call this meeting to order. This is a meeting of the Plant License Renewal Subcommittee. I am Graham Leitch, Chairman of the Plant License Renewal Subcommittee.

The members in attendance are Jack Sieber and Peter Ford and Stephen Rosen. We will be joined by two other members, Mario Bonaca and Graham Wallis shortly. We also have with us an ACRS Consultant, Mr. John Barton, who is present, and Marvin Sykes of the ACRS staff is the designated Federal official for this meeting.

The purpose of this meeting is to discuss the license renewal application for the Dresden and Quad Cities Nuclear Power Plants. We will hear presentations from the NRC's Office of Nuclear Reactor Regulation and presentations of Exelon Generating Company.

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

The rules for participation in today's

meeting have been announced as part of the notice of this meeting, previously published in the Federal Register on March 23, 2004. We have received no written comments or requests for time to make oral presentations from members of the public regarding today's meeting.

A transcript of the meeting is being kept, and will be made available, as stated in the Federal Register notice. Therefore, we request that participants in this meeting use the microphones located throughout the meeting room when addressing the Subcommittee. The participants should also first identify themselves and speak with sufficient clarity and volume so that they can be readily heard.

I would now like to call on Dr. Ford who has a brief comment to make.

DR. FORD: I am a G.E. retiree and, therefore, have a conflict of interest on G.E. Services related matters.

CHAIRMAN LEITCH: Thank you, Dr. Ford.

We will now proceed with the meeting. I don't see --

MR. LEE: This is Sam Lee. I am the Section Chief.

CHAIRMAN LEITCH: Sam, would you have some

introductory remarks for us?

MR. LEE: P.T. Kuo is supposed to be here. I guess he probably got caught on the way from the first meeting to over here. We are happy to be here to present you with the results of this topic. We will be addressing Quad Cities license renewal application, and T.J. Kim is the Project Manager. He will lead the staff presentation, and Kimberley Corp -- she is assisting T.J., and she will make the presentation on Chapter 4, TLAA, of the application.

We also have Region III. Laura Kozak is the team leader on the inspection, and she will make the presentation today of the inspections. With that, we will turn over to Mr. Bohlke.

MR. BOHLKE: Thank you, Mr. Chairman, members of the Subcommittee. I am Bill Bohlke, a Senior Vice President with Exelon Nuclear. The principal speakers today, seated to my left, are at the far end of the table, Fred Polaski, our Manager of License Renewal for Exelon, and Rob Stachniak, who is the Project Engineer for the Dresden and Quad Cities license renewal project.

Also with us today is Jim Meister, who is the Vice President of Nuclear Services, as well as other members of the corporate staff at Cantera who

have supported this license renewal application, and two representatives, one each from Quad Cities and Dresden, who have also participated in this project.

We will start with a pretty high level overview, and then work successively lower in detail as we work through the agenda. The agenda is on page 2, and you can all read that, and I won't.

On page 3, a little timeline: We submitted the combined license renewal application for Dresden and Quad Cities about 15 months ago, early in January 2003. In November and December of this year, we received the supplemental environmental impact statements in draft form for Quad and Dresden successively, and earlier this year the draft SER was issued.

Although I am sure many of you are familiar basically with the plants, I thought I would just take a little time to bring us all to the same level of understanding here of both BWR-3, Mark-1 containments. They are both fresh water cooled, Quad from the Mississippi, and I will show you a picture of that shortly, and Dresden alternatively from a cooling lake or from the Kankakee/Illinois River. Again, a picture is worth a thousand words there.

As a result of the extended power uprate

license application, we were granted the approval to run a 2957 megawatts thermal. Our current license for Dresden 2 expires in 2009, and Unit 3 expires in 2011, while the Quad Cities license expire shortly thereafter in 2012. As you know --

CHAIRMAN LEITCH: Bill, I had a question about the Quad Cities. I noticed that in some of the literature we received, it listed exactly the same date for Quad Cities 1 and 2. I was wondering, is that correct? Were both licenses issued at the same date or is that something that has crept -- an error that has crept into the process?

MR. BOHLKE: I believe the answer is yes.

CHAIRMAN LEITCH: Okay. Unusual, but fine.

MR. BOHLKE: Or lucky. Didn't have to do it twice.

The full Committee and appropriate subcommittees, of course, have reviewed the extended power uprate license application which were granted in 2001, and the uprates were accomplished in 2001 and 2002, and we will be talking about that in a little more detail later.

Slide 5 is a shot of the Dresden power station. In this view we are looking north, and that

is the Illinois River. The Kankakee and the DePlaines form just upstream to form the Illinois River.

This is the Unit 1 containment, Unit 1 turbine building. This is the Unit 2 and 3 reactor building, the Unit 2 and 3 turbine building, the 345KB switchhouse.

Now most of the year, with the exception of the summer, Dresden operates on a closed loop system with a cooling lake. The lake is down here. So you can't see it, but here is the hot canal going out to the lake, and this is a return canal from the lake.

During the summer months, we operate on indirect cycle. We take cold water from the Kankakee over here, bring it into the plant, discharge it, run it through the lake, back through the cold canal and out to the Illinois.

In 1999-2000 time period we began adding cooling towers. The reason we did that was we were taking severe down-powers during summer months when we were running both units at full power. That had historically, as many of you may remember, not necessarily been having a problem at Com Ed. Once the units started running dependably, the lake constraints, lake temperature constraints, became an

issue for us. So we added cooling towers.

Here we are showing two on the hot canal. There has since been one added here for a total of three banks of towers, and one for the cold canal. The cold canal towers are principally to limit the discharge temperature to the river when we are on indirect open cycle. The hot canal towers do most of the work.

The training building is over here. Graham, you were asking earlier about the simulator. The simulator is located in this training building.

CHAIRMAN LEITCH: I see. Thank you.

MR. BOHLKE: Next slide, please.

DR. ROSEN: Is this where the simulator has been since Day One?

MR. BOHLKE: The simulator used to be over at the Morris facility at GE. When we built the training buildings at all of our sites except Braidwood, we moved the simulators into the training buildings.

This is Quad Cities' site on the Mississippi River. This is looking eastward so that you can see that the layouts or configurations of the reactor building and turbine building are very similar to what you saw at Dresden, just looking at the

reverse. So here is the turbine building, reactor building.

The inlet from the river comes to the crib house, and it is, once through, discharged into this pond and then through underground pipes out several hundred feet offshore into the Mississippi River.

DR. ROSEN: What are those buildings on the lower portion of the turbine buildings?

MR. BOHLKE: There?

DR. ROSEN: Yes. There are two, looks like concrete buildings from the air, that one and the one -- Yes, those two.

MR. BOHLKE: Mike, those are? Mike Hayes.

MR. HAYES: Those are transformers, I believe.

MR. BOHLKE: He means these right here.

MR. FLICK: The area down there, we built a LMTD building, which is the white one. Then we have rad waste down there. We've got the two CCSTs. I'm not sure from here exactly what building you are --

MR. BOHLKE: What is that building right there?

MR. FLICK: Rad waste.

MR. BOHLKE: Rad waste.

DR. ROSEN: And the similar one for the

other unit?

MR. BOHLKE: Yes.

DR. ROSEN: Those are rad waste buildings?

MR. BOHLKE: The switch rad is up here, quite obviously. I failed to show you on Dresden -- We ought to go back just for a second. I wanted to point out to you that the ISFSI for the Dresden units is located here. Now move here. The ISFSI for Quad Cities we expect to become operational in 2005, and it will be located in this area.

DR. WALLIS: What did you say that was?

MR. BOHLKE: Independent spent fuel storage installation, ISFSI. I'm sorry, I assumed you all were with us on those little pieces of jargon.

Now you all probably remember back in the Seventies that there was an attempt to have a cooling canal for Quad Cities. That canal did a big loop here. There used to be spray nozzles. That was abandoned not terribly long after it started up, and that body of water now exists as a fish hatchery.

CHAIRMAN LEITCH: Bill, could you go back to the photograph of Dresden? I had a question about the status of Dresden 1. I understand that it is decommissioned and in safe store.

MR. BOHLKE: We are going to talk

specifically about that when Rob makes his presentation. And if we don't answer whatever question you have, I'm sure you will bring it up.

CHAIRMAN LEITCH: Okay, good. We will defer it until that time. Thanks.

MR. BOHLKE: Let's move on. On Slide 6 we summarize the significant plant differences. As I said earlier, both plants are BWR-3s, and both plants are Mark I, but as was not unusual in the evolution of the various BWR designs -- I'm sure Dr. Ford knows this better than me -- there were changes within model designators.

In this particular instance, Dresden was the last of the isolation condensers. In Dresden both units have the isolation condenser system. For Quad Cities, the reactor core isolation cooling system was provided. So that is one difference between the plants.

Similarly, the Dresden configuration combined features of the shutdown cooling system and a low pressure cooling injection system, and all those functions have been subsumed in Quad Cities in the residual heat removal system. What we called the containment water cooling system on Dresden is now more commonly known, not only at Quad Cities but

through the BWR fleet, as the RHR service water system.

There are additional unique differences when we talk about how the plants approach the shutdown from a fire. For Appendix R at Dresden, we have the high pressure coolant injection system combined with the isolation condenser system for high pressure injection cooldown.

Those functions are replaced at Quad Cities by the high pressure coolant injection system and reactor core isolation cooling system, but Quad Cities uniquely added a safe shutdown makeup pump, I believe, in the early 1980s which is configured to be able to supply high pressure coolant, motor driven pump to either unit. And a further difference is in the exact form of the circulating water flow, as I described earlier, and I don't think I need to spend anymore time on that.

Slide 8 briefly summarizes the current regulatory performance of the units. All of the indicators, all the reactor oversight performance indicators for Quad Cities are currently green, and they are all green for Dresden with the exception of HPCI unavailability, which dates back to a 2001 event.

If we continue on the present course, we

expect to exit white for green later in the third quarter of 2004.

DR. ROSEN: It's just the one event that had a long unavailability, Bill?

MR. BOHLKE: Yes. That was the water hammer event at Dresden 3 which went inadequately diagnosed by the staff there, and it worked its way through the process, and I believe it was identified either in late 2002 or 2003 as a white finding.

CHAIRMAN LEITCH: But within the past week, was there not also another HPCI unavailability at Dresden, I think it was?

MR. BOHLKE: Yes. We are working through the analysis of that event. You are absolutely right.

CHAIRMAN LEITCH: It sounded from the early indications that a wire had been lifted at a previous surveillance test and remained lifted until this very recent surveillance test. Does that sound right?

MR. BOHLKE: That is my top high level understanding. Elliott Flick is here from Dresden station. He will give us a little more detail on that.

MR. FLICK: Hi. I am the engineering director at Dresden, and the EES. We are still just

preliminarily into this. This happened two nights ago, and a surveillance that took place approximately a month ago there were two wires that were lifted. So that particular function, which has to do with the high and low level switches for the CST which would automatically swap on a low level, or not -- Well, the wires were lifted.

So we believe that the system was inoperable. However, based on the wiring configuration, it was available during that entire time.

DR. ROSEN: But by lifted, you mean disconnected?

MR. FLICK: Yes.

DR. ROSEN: But you have a procedure for normally lifting wires during surveillance tests and restoring them. Is that so? Is there a normal procedure for handling that circumstance?

MR. FLICK: Yes, there are.

DR. ROSEN: It was not followed in this case?

MR. BOHLKE: Yes, this was procedural noncompliance, Mr. Rosen.

DR. ROSEN: This is not uncommon. So there typically is a procedure that people follow, get

the wire off, do the test, and re-land them.

MR. BOHLKE: You are right. Lifting leads is a common procedure for performing surveillance at many of the plants, if not all the plants in the U.S. fleet, and it is controlled by procedure. This appears to be a case of procedural noncompliance.

DR. WALLIS: You don't know if it was still lifted? I would think that there would be an indication.

MR. FLICK: The leads were actually found lifted in the field.

DR. WALLIS: But you have to go and look to find out? I would think that electrically you would know.

MR. FLICK: When you perform the test.

DR. WALLIS: -- monitoring of the continuity of the circuit or something.

MR. FLICK: Well, in this case, and while we are just freshly working on the root cause analysis to get to all of the causes, there were two different work procedures that were taking place simultaneously, one of which had lifted leads, the other one which was completed; and there may have been some miscommunications over which of the procedures was actually completed, when that was returned to service.

MR. BOHLKE: Elliott, I think the question was: Was there an indication, either locally or in the control room, which would have pointed the operatives to the fact that we had a lifted lead?

MR. FLICK: No, there was not.

DR. WALLIS: I'm surprised. It all depends on humans to do the job right? There is no automatic check electrically?

MR. BOHLKE: In the design of these plants, and in many others that followed, not all lifted leads are indicated.

DR. WALLIS: I would think, if they are important to safety, there would be an indication.

MR. BOHLKE: I won't deny that we've gotten smarter, but the basic design didn't have that.

Slide 9 summarizes the plant performance for the last five years, and I am not to go over each of these numbers. But you can conclude that the performance has been quite consistent and quite good for both these units, both these stations, all four units, over the last five years.

Re-shielding outage length has been at the low end of the current industry experience, and the radiation exposure for Dresden are in the middle of the pack. The radiation exposures for Quad Cities are

not in the middle of the pack. Quad Cities is a plant which suffers from a high source term.

Starting last year, we put together a rather aggressive program to identify and systematically remove the source term, and completed the first stage of that this spring in the Quad 2 outage where we replaced buckets in the last three rows of blades. Those buckets contained a lot of stellite material, which were adversely affecting our source term.

In addition, there are other aspects that we are working through but, of course, both plants, all four units, use hydrogen water chemistry. So in operations, those doses tend to be a little bit higher.

CHAIRMAN LEITCH: The manual exposure on the Quad Cities in 2002 -- was that mainly driven by the steam dryer work?

MR. BOHLKE: Two things. First of all, if you will notice the third line above that, and the second line, where we have two outages per year in the even years, we have since slid the units. They are now on annual cycle. So the years that you have two outages, you will have a higher dose. But specifically in 2002, yes, the steam dryer work on

Unit 2 did exacerbate that number.

CHAIRMAN LEITCH: Okay, thank you.

DR. BONACA: Well, what happened in '99 to 2000? You had two refueling outages in '99 and one in 2000.

MR. BOHLKE: Oh, between 1999 and 2000 on the Dresden units is when we switched from 18-month to 24-month cycles, and that's why the timing is as it is. They now -- So the Dresden units now refuel in the early fall, and the Quad Cities units refuel in the early spring.

DR. BONACA: That seemed as if one of the units had a refueling in both months.

MR. BOHLKE: No, it was 18.

DR. BONACA: Oh, okay, I see what you mean. So I understand.

DR. ROSEN: And what was the cause of the very large radiation exposure in the year 2000 at Quad? Is it two outages?

MR. BOHLKE: Two outages principally and a high source term. I don't recall that -- There was some weld overlay work, if I recall correctly. That may have been a high dose test.

DR. ROSEN: And the same thing for 2002 or did you already answer that?

MR. BOHLKE: In 2002 is a combination of the refueling outage doses plus the steam dryer repair, and that's when we hit the peak exposures, I believe, from refueling outages.

We had -- Quad Cities had historically used decontamination of portions of the recirc system, primary system, to try to lower the exposures. Once we applied noble metal chemical addition, that option wasn't available to us, and it is only this year that we did a portion of a decon combined with a source term reduction and then another noble metal chemical addition to try to (a) remove radiation exposure sources, but then recondition the piping to mitigate stress corrosion cracking.

Moving on to Slide 10, the plants underwent some fairly significant modifications, principally balance of plant for the extended power uprate. Again, I am not going to go down this list. I would like to pick out two, I think, of some particular interest.

As we prepared to do the uprate, we needed to understand the condition of feedwater heaters shell site from erosion, corrosion or floats or other corrosion concerns. We wound up having to put significant amounts of plate in those heaters, around

those heaters, to provide additional wall thickness which, on the other hand, gave us some real insights into a different way to approach the aging of feedwater heaters.

Where before we might have been inclined to buy a whole new heater on the older plants where the layout really makes that a very difficult job such as we had experienced at Peach Bottom, coincidentally, we found that being able to replace large sections of the shell or reinforce large sections of the shell and nozzle area with saddles turned out to be a pretty effective way to do that. We did that on the three subsequent units.

DR. FORD: Can I ask a question? In your LRA you mentioned that you had integrated a problem before it was a serious problem.

MR. BOHLKE: Yes, that's right.

DR. FORD: Was there use of the check works and analysis for that particular problem?

MR. BOHLKE: It was less -- It was check work supported our extrapolations of the wear rates, but the problem was principally discovered through shell thickness measurements using ultrasonic techniques.

DR. FORD: But was the amount of erosion

predicted?

MR. BOHLKE: We had a predictor that there was going to be erosion there. We hadn't measured it finitely to determine extent. So we would reinforce enough, because we didn't want to go back into it twice.

The other thing that is worthy of mention is the steam dryer perforated plates. Now in the cycles at Quad Cities, which ended in about 2000, we had experienced high moisture carryover at the end of the cycle.

What we found from our research was that it was due to clustering of high power rods, and the steam production from those rods and their location could overwhelm a dryer bank and, once that bank was saturated, basically just blowing wet steam through that.

So GE devised an approach wherein we put a perforated plate under the bottom of the dryer to redistribute the flow and, as a result of that, saw extreme reductions -- significant reductions, like almost a decade worth of reduction, in the moisture content of the steam which, of course, makes the plant run a little bit better.

So those were two interesting things.

There were, of course, the other things that you would expect as you read through the list. I'm sure they are not particularly --

DR. FORD: But we haven't been updated very recently at all on the steam dryer cracking problems, which I think you will be talking about later on. Is that right? But was that particular modification, putting in the perforated plates, any input to the reason why you got fatigue in those components?

MR. BOHLKE: No. All it did was redistribute the steam entering the bottom of the dryer.

DR. FORD: Okay. That redesign didn't affect stiffness or anything like that?

MR. BOHLKE: It barely touched the differential pressure going into the dryer. We don't think it was much of a contributor at all.

DR. WALLIS: Now is this just a special design for you folks or is it a generic thing for GE dryers? Do they do this to all their plants?

MR. BOHLKE: I can't comment on that. I just don't know the answer to that. Perhaps when they come in again to talk to you about steam dryers, they will be able to answer that. They may have. I simply

don't know factually if that's true.

Slide 11, the following slide --

CHAIRMAN LEITCH: Could you go back to that previous one just a second? The condensate demineralizers -- are they now the same at both plants? They both have prefilters and in-line mineralized?

MR. BOHLKE: No, because they started out with different filtration. We've got Powdex system at Quad, and we have a deep bed at Dresden. So that the answer at Dresden was to put in a prefilter principally for iron. The answer at Quad was to add another Powdex vessel, so that instead of six we had seven or whatever the numbers were, just because of the difference in fundamental water treatment.

CHAIRMAN LEITCH: And everything beyond the demineralizers is without copper now?

MR. BOHLKE: Yes.

CHAIRMAN LEITCH: There is no copper beyond the demineralizer?

MR. BOHLKE: The tubes aren't and the heaters with the condenser. They are stainless in the condenser, and I believe they are stainless in the heaters. So there's not a lot of copper floating around.

CHAIRMAN LEITCH: Thanks.

MR. BOHLKE: Slide 11 will talk about the Dresden experience following the uprate. As I said earlier, we received the license for extended power operation in the fall of 2001, just after Dresden completed its refueling outage. So we increased its power on the fly, and you see there the capacity factor that we have achieved on that unit since its uprate.

I note the bottom line on this slide. That unit, from the time it started up after its refueling outage, ran 690 days. So at least in the instance of Dresden, there were no real challenges that we couldn't manage with respect to Dresden extended power uprate operation. However, we did have an EHC pressure switch buzz its way to death on the startup due to high frequency vibration, and we made the support system for that switch and then subsequently the remaining switches that looked like that much more robust to take that out of play.

Over in the turbine building on the suction relief valves on the reactor feed pumps, we have had welds fail due to vibration, and again that is what we would characterize as a more or less expected result of uprate when you are putting the

unit into a different performance mode. We predicted and we expected that we would have some failures. This pretty well fell into that category.

The feedwater sample probe failure was somewhat different in that we had had a previous sample failure well before EPU. EPU, however, failed the replacement probe, and it went into the feedwater sparger, and that was not expected, obviously.

DR. WALLIS: This is a probe that sticks into something?

MR. BOHLKE: It sticks in the feedwater flow.

DR. WALLIS: Is it vibration failure again?

MR. BOHLKE: Vibrated itself away, as it had done previously.

DR. WALLIS: This is increased feedwater flow rate? Is that what has caused it?

MR. BOHLKE: Well, that was a contributor, yes. So that's been redesigned.

Then we backfit preemptively the modifications from Quad Cities Unit 2 to both dryers. We upgraded the dryers in Dresden 2 during its normal refueling outage after two years of operation, and we preemptively upgraded the dryers on Unit 3 to

incorporate the full Quad Cities fixes as we knew it at the end of last year. But fundamentally, those units have run consistently and predictably.

DR. WALLIS: So these vibrations are due to power uprate and increased flow rate? Is that what they are all due to?

MR. BOHLKE: Increased flow is one of the phenomena, particularly on the water side.

DR. WALLIS: It appears that they cannot be anticipated or you just expect that there may be some vibrations. You just have to fix them if they occur?

MR. BOHLKE: My history in starting up nuclear power plants was there are systems that are vibration sensitive, the condensate and feedwater systems and the main steam systems and some of the crossovers being particularly sensitive.

So in the evolution of startup, one of the things that we are constantly doing is walking down the plant and observing where we have vibrations --

DR. WALLIS: So your strategy is to offset the power and see what happens, let things buzz, then--

MR. BOHLKE: Well, because you can make some predictions analytically, but they are not very

robust predictions, and they dependent on length and mass and all those good things. So that's why you need the walkdowns.

DR. FORD: Dr. Bohlke, at the two Quad Cities plants there was, unfortunately, one after the other, failures of the steam dryers.

MR. BOHLKE: We are going to talk about that next.

DR. FORD: Okay. I'll put off my question.

MR. BOHLKE: Then we will see if I cover it in enough detail, and we will decide, if you don't mind.

DR. FORD: No, absolutely.

CHAIRMAN LEITCH: Before we leave that previous slide, the high frequency vibration -- was that associated with the mounting of the pressure switch or with a hydraulic vibration? Do we know? How was that corrected?

MR. BOHLKE: The mounting of the pressure switch. The EH system by itself is unchanged, no more flow, no more pressure.

CHAIRMAN LEITCH: And no hydraulic vibration? It's just the mounting of the pressure switch?

MR. BOHLKE: So it was steam flow, more vibration on the mother component, and then a switch attached to it.

CHAIRMAN LEITCH: Right. Okay, thanks.

MR. BOHLKE: Quad Cities: Quad Cities' implementation on Unit 2 came in the spring of 2002, and you see the capacity factor since then in Quad Cities 1 later that year. Now those are the years in which we had two refueling outages.

While the Dresden power increase was 17 percent, the Quad Cities power increase was 17.8 percent because, strangely enough, Quad Cities was licensed with 14 megawatts thermal less than Dresden, for whatever historical interest that is.

Again, we had a startup failure, and this happened to be on a main steam low point drain really early on in the post-EPU operation. Then we went into the summer of 2002 when we experienced our first dryer failure, and that took a three-week or so shutdown to replace that, and then a year later in June, not quite a year later, we experienced another degraded condition there.

I believe you know the background associated with those. In both cases, we had plates fail in the dryers, in the dryer structure.

In 2001, fall, we had a similar occurrence at Unit 1. When we shut down for the refueling for Quad 2 in the spring of this year -- Well, excuse me. At the time we went in looking at the dryer during a drywell walkdown, we also discovered damage to electromagnetic relief valves. That was unexpected.

We repaired that and went back on line, and then we found additional damage, which could be characterized as small structural defects in the welds on the dryer. We discovered that during the refueling outage.

For each of the instances where we shut down the units, twice on Unit 2 and once on Unit 1, it was because of a noticeable, measurable increase in moisture carryover, which became our principal indicator of an issue. That contrasted the damage we found in March 2004 during the outage where there was no indication that there was any malperformance by the dryer in that regard.

DR. ROSEN: How do you detect the moisture carryover?

MR. BOHLKE: We do moisture carryover measures on a daily basis.

DR. ROSEN: Use radioactive tracer?

MR. BOHLKE: No.

DR. SIEBER: You can do a calorimetric

MR. BOHLKE: Calorimetric. Thank you, Jack.

DR. ROSEN: What kind of damage did you find on the electromatic relief valves? Was it enough to make the valve nonfunctional?

MR. BOHLKE: Let me ask Bill Porter from Quad Cities, who is the design engineering manager to specifically answer that, so I don't get caught up in what I don't know here. Go ahead, Bill.

MR. PORTER: Yes. I am Bill Porter. What we found was we had one relief that had had another problem or we had some cold spring in a leakoff pipe, and that pipe had broken. That particular relief valve, when the pipe was disconnected, it exacerbated the vibrations, and that one was inop.

The other relief valves, we noted some differences in the solenoid arrangements where we saw wear on bushings and some other wear, and we tested all those and all those were still operable. We subsequently modified the solenoids on these valves to make them -- on Unit 2 to make them more robust, and replaced all the ones on Unit 1, and we will be upgrading them on the next outage. But the one that had gone inoperable was due to other problems with the

valve.

CHAIRMAN LEITCH: Now these valves -- The terminology is confusing me just a little bit. Are these ADS valves?

MR. PORTER: They are used for ADS, but in this case on Dresden and Quad these are solenoid operated valves, electromatic relief valves. They don't have the air actuators like some of the other plants, like Hatch and so forth.

CHAIRMAN LEITCH: Okay, thanks.

DR. BONACA: I have a question. You know, I am looking at the consequences of the upgrades and uprates. When I look at license renewal, most of the aging management problems that are presented are existing problems, minor changes or variations, and they really, most of them, are based on past experience.

If you look at -- You go program by program, you reference operating experience. The question I am having is, you know, in this case you have practically a new plant. How are you planning to reflect operating experience from an uprated plant -- some systems are going to be more challenged than before -- into the license renewal application?

I really didn't see any mention anywhere

in the programs that there was some consideration of that.

MR. BOHLKE: I think the answer goes like this. We have some near term issues that we need to work ourselves through that may reflect or may require some additional inspections during refueling outages of equipping, which we may normally maintain but perhaps we don't maintain every cycle.

So there may be some things like that which come out. But fundamentally, where we are here is attempting to gain a very thorough understanding of the phenomena which are causing this, and this is the major focus of what we are trying to do.

We are not running the units at Quad Cities at their licensed power level. We are running them at the pre-EPU power level except for Quad Cities when we increase the power level specifically for the purpose of collecting data, principally on vibration.

We hope that we are able to gain enough data to develop the insights that will let us bring the question of loading of the steam dryer to a final resolution, so we can say with great certainty and with appropriate conservatism that we understand the loads and we have bounded them for purposes of either upgrading the dryer or replacing the dryer.

Similarly, we are attempting to understand the drivers for the vibrations, principally at Quad Cities. We don't see the level -- the baseline levels of vibration at Dresden that we do at Quad Cities, even though the units are reasonably similar, because we think there are some specific configurational differences which are driving it.

Again, we are trying to understand what those levels are and have a good model to predict what they are for purposes of developing a conservative bounding approach to those drivers. Out of that, I expect, will come criteria that we will need to adhere to for normal operations and maintenance.

What we are dealing with at Quad Cities principally is not so much a license renewal issue as an issue of how do we put the plants in a configuration where we are confident that they will run both safely and reliably at 912 megawatts electric, which is our desired power level. That's the focus.

Along the way, it is making sure that we can guaranty to our management, guaranty to the staff, that we've got this thing well understood and bounded, and whatever modifications we need to come out with have been applied to the plant. That's where we are

going with this.

DR. BONACA: No, I understand. I just -- You know, reflecting on the problems I went through, they are not detailed enough to understand it, but there is no reference to a power uprate anywhere. Most of them state that this program is an established program, there is good operating experience, they have been successful, they are going to maintain it. But in many cases, you've taken exception of GALL on frequency of inspections by saying, well, my inspection is less frequent than GALL, but I have good reasons that say that it is adequate.

I have not made a judgment on which program might be affected by the power uprate, but in some cases it may have some impact. You know, I was surprised to see no discussion of that. I was also planning to ask the staff if in the review they considered that point.

MR. KIM: The answer is yes, we have considered power uprate in our review of license renewal application. We will talk about that.

DR. BONACA: Because subcomponents doesn't make any difference, of course. Some other component does, simply because process parameters are changed. So it's just I was looking for it when I was reviewing

the application, and I didn't see it anywhere.

MR. BOHLKE: Rob, did you want to make a point?

MR. STACHNIAK: Yes. This is Rob Stachniak. When we looked at all of the various systems for aging management, we looked at all of them with regard to post-EPU conditions, and there were changes in terms of operating parameters, such as velocities and temperatures and so forth. But in each case, we looked at them one by one, and saw the same aging mechanisms that we would expect.

The only change that I could tell you that we recognize would be the acceleration of the aging effects. But the programs in every case are set up so that, when you detect a problem, you are going to either, or both, expand the population as well as the frequency.

So the programs, if you will, change to accommodate those effects, but parameters such as increased power and the effects of neutron embrittlement, increased flows, in fact, increased temperatures and the effects on equipment -- those were all taken into effect in the review.

We didn't distinguish, however, the fact that we had a power uprate. We just treated the

plant.

DR. BONACA: No, no, no. I believe that you did that, of course. I mean, this is a different plant. It's uprated. I just was wondering -- You know, you don't have 20 years of experience at those conditions to rely on for comfort. So I just cannot go in great detail, but in some cases I wasn't so convinced that, for example, defending a certain inspection interval that you have defended was appropriate. Maybe you have to do a more frequent inspection.

In some cases, GALL, in fact, recommended more frequent inspection. You took some exception. The staff accepted it, and I was wondering, you know, would it be more prudent, given that you have a new plant, that you would go to more frequent inspections. Anyway, I am not being specific here about some problem. We can go to some examples later on.

DR. SIEBER: On additional question. In any of these four units, did the vibration induce the failures, generate loose parts that you didn't recover?

MR. BOHLKE: When the feedwater sparger went at Dresden, it impaled itself on the tee inside the vessel, and we actually had to -- We actually

recovered it, but it took us a bit. Actually, we found it first, and figuring out where it came from was an issue.

At Dresden Unit -- Bill, at Dresden Unit 1, I don't recall. Did we finally find -- I'm sorry, Quad Cities Unit 1. Did we finally find that last part?

CHAIRMAN LEITCH: Would you move to the microphone and identify yourself, please.

MR. PORTER: It really wasn't -- This is Bill Porter. It really wasn't EPU per se, but the dryer two times has ejected parts. The first time we recovered them all. This last time we believe the part is in the lower reactor head, and we have plans going forward to evaluate that or retrieve it, depending on the situation that we come up with.

DR. SIEBER: Are you going to attempt to recover that part somehow?

MR. PORTER: That is our current plans in the next refueling outage for that unit. That is Unit 1, by the way.

DR. ROSEN: How have you assured yourself that that lower part won't block flow and damage fuel?

MR. PORTER: We did an analysis of where the part could be. We did extensive looking for this.

We also found indication on the recirc pump impeller, some minor marks on it, that showed that we had transitted that. That is basically by process of elimination and looking at every other place that the part could conceivably be other than the lower reactor head, determined where we believe the part is.

We looked at the components in the lower reactor head. They are robust components compared to the mass of this particular piece that's in there. Most likely it is at least two pieces now, based on the marks that we saw, and we plan on attempting to find that during Q1R-18 which will be coming up next March.

DR. ROSEN: How big a piece are we talking about, assuming it is in two pieces?

MR. PORTER: Well, the whole piece, quoting from memory, is about 6 1/2 by 9 inches, as I recall.

DR. ROSEN; It's plate?

MR. PORTER: Yes, it's plate material, half-inch plate.

DR. ROSEN; So the broken half -- it would be half those dimensions. Of course, we have no assurance that is true.

MR. PORTER: Right. That's correct. It's

a triangular piece.

DR. ROSEN: Do you have any loose parts monitoring equipment?

MR. PORTER: No, sir. This vintage didn't have the loose parts monitors. What we saw was basically the marks on the impeller.

MR. BOHLKE: Once it's down in the bottom head, down in the penetrations in the nozzles in the bottom head, which is a very low flow area, we wouldn't even expect it to move.

CHAIRMAN LEITCH: Has there been any restriction of your ability to take suction to the reactor water?

MR. PORTER: One thing that we have seen since then is we have had an issue with the thermocouple on our lower head drain. It is possible that there may be some blockage there. This is the one of the things that we are considering and going to look at.

I will say, though, that there have been parts found in that area before that have not affected operation or affected those temperatures. So it could or it couldn't be this part, depending on what we find when we go look for it.

CHAIRMAN LEITCH: We have picked some

parts up in other reactors from that lower head. It's quite an amazing thing, how they go down there. I mean, it's got to be, what, 90 feet under the surface of the water, and they pluck those things out of there.

DR. SIEBER: Well, they swim. You end up with two problems. One is a potential flow blockage. The other one is fretting due to vibration and movement. You typically do a calculation to make a determination that it is safe to operate with the part where you think it is and in the shape you think it is in. On the other hand, the longer you leave it there, if there is vibration and movement, it will fret away against whatever it is laying against, which eventually, given enough time, will cause a leak.

So I would presume that you are really looking for the part and not relying on the calculation that says it is okay to run.

MR. BOHLKE: Yes. We have to, as you know, do some significant disassembly to fly a robot down in there.

DR. SIEBER: That's right, or a camera.

MR. BOHLKE: Which is how we are going to do it. We will fly one in there. We've done that before for other units for inspection purposes.

DR. ROSEN: But, Bill, your sense of it, I think, from your earlier comment is that it is probably laying on the bottom of the vessel, because the flow is low enough that it's not flying and impacting the bottom of it?

DR. SIEBER: Well, the interesting thing is that, in order to get to the bottom, it has to go through -- down through a lot of upflow, and so it could be someplace else, too.

MR. BOHLKE: We haven't seen any indication that it would be anywhere else, such as lodged against the bottom guide. We don't have any indication of that. So we will do that -- our search for it very methodically next spring, and see what we find.

CHAIRMAN LEITCH: And just one more thing on this issue, Bill, and I know that is perhaps a little off the topic of license renewal, but I am just curious. On Quad Cities you are not up to what is now 100 percent? That is, you are not up to the EPU rating?

MR. BOHLKE: No, we are 2511 megawatts thermal.

CHAIRMAN LEITCH: Which is the original 100?

MR. BOHLKE: Which is down in the 780 megawatt range, if I recall.

CHAIRMAN LEITCH: And your plans to come up are based on what? What needs to happen for you to get on up?

MR. BOHLKE: Was it last week or the week before? Last week we came up to do some data gathering. We staged our way up to 912 megawatts, which is our electrical limit, not our thermal limit. But the units, as you may recall from the previous EPU review, are limited by the generators, not by the thermal power of the core that we are licensed to.

So the only time we come anywhere near the 2957 is during the hottest month of the summer. Typically, in the winter months, for example, we are well down below that.

So what we did last week was work our way back up to our electrical limit, taking measurements at preselected locations so we could begin doing our calculations and comparisons, and we came back down again.

CHAIRMAN LEITCH: Then it depends on some of this analysis work that is ongoing when you come on up to the full power rating, although you may not be able to get to the licensed limit, but the electrical

limit anyway.

MR. BOHLKE: Right. That concludes my portion of the presentation.

DR. WALLIS: How do you find out these parts of dryers? Certainly, there may be a change in carryover, but maybe not. A piece can bend or come loose, and it doesn't necessarily change the effectiveness of the drying. So it rattles around for a year until somebody happens to notice it during refueling or something?

MR. BOHLKE: No. Let me just spend a minute and tell you how these things played out, and then what we went to do.

We had the first one in the -- The first indications were in June 2002, and it manifested itself through two things, increase in moisture carryover and a difference in the indicated reactor vessel water level.

DR. ROSEN: Indicated reactor?

MR. BOHLKE: Reactor vessel water level. You all need to have a special session just focused on dryer, and I believe staff is starting down that path, because I'm not prepared to do it in enormous detail. Jim Meister and Bill Porter have even more information, but we don't have a lot of slides

prepared, and it needs to be a very logical presentation so that the facts unfold. But short version.

We saw the increased moisture carryover difference, slight difference in the reactor vessel level between one side of the vessel and another, and we knew something was going on. Eventually, we shut down at an appropriate point to go in it.

Now when we took the lid off and looked at it, there was a hole in the dryer. You could see it. We said, well, the hole is about the right size. In fact, the hole is the right size for the moisture carryover we saw.

A year later, a little bit less than a year later in June, we saw increased moisture carryover, and we shut it down, and we saw a hole about the size we expected to see.

That fall we got to see Dresden 2 in its refueling. This was in the fall of 2003, and Dresden 2 had a crack-like defect where we expected, but it wasn't throughwall. There was no moisture carryover, but you could see where at some point in time perhaps, it would get bigger.

So it turned out that moisture carryover is a very, very good predictor that you had a

separation between a weld and a plate or in the plate base material. So that is why we do the daily moisture carryover measurements.

We think we find it very soon after it happened, and we think it gives us a pretty good indication of how big the hole is, if you will, if there is a hole there. So that's how it has played out for us.

DR. SIEBER: Well, the only reason why I bring up the unrecovered loose parts is, to me, that is a new and different aging mechanism, and I think the staff ought to monitor what goes on at that plant to see that they resolve where the part is, whether it is recovered or not, or if it is safe to leave it where it's at.

MR. BOHLKE: I can't predict the future, and I can't predict the regulatory path, but I certainly agree that it is likely that there will be some attributes that we previously didn't think were necessary that will be employed to provide appropriate assurances that everything is okay.

We were a little bit surprised that a loose part would disappear on it like that one, but we thought we would capture it.

DR. SIEBER: Well, it actually happens.

This is not a rare, unique event. A lot of plants have loose parts, and a lot of them are just positioned. It's just that, to me, there is a potential for a different kind of aging mechanism.

MR. BOHLKE: Oh, I agree with you about plants and loose parts, but it was a surprise to us that a part from a dryer could go undetected.

DR. SIEBER: Well, it surprises me that it can go backwards against the flow and end up in the bottom of the vessel. I would expect it would go out.

MR. BOHLKE: Well, the jet pumps are going to sweep it down.

DR. SIEBER: Yes, it's possible.

MR. BOHLKE: And you know, there's a lot of stuff in there to hit and slow it down and move it into areas. I mean, there's an awful lot we don't understand about what is going on, I guess, is the best point.

DR. SIEBER: Yes. It will hunt for a way to get out of the rapids. There is no doubt about that.

MR. KIM: Excuse me. Just to clarify on the loose parts issue, isn't it true that there are some pieces, broken pieces, that ended up down the main steam line?

MR. BOHLKE: From the very first Quad Cities event, and we opened up the vessel in July 2002, we found the missing plate in one of the main steam lines lodged in the Venturi.

MR. KIM: Right.

CHAIRMAN LEITCH: That relates to my question. A lot of this is not really license renewal, but this one issue, I think, is. We have said that the steam dryer is not in the scope of license renewal, because it is not safety related. Yet in almost the next sentence of the discussion, it talks about these parts as migrating down the main steam lines and being caught on the turbine stop valve screens, which says to me they have been through the MSIVs.

How do we know they couldn't get lodged in the MSIVs and prevent the proper operation of the MSIVs? What is the rationale? I guess the staff accepted the position that the dryers are not in scope, and I am just wondering what the rationale is for that position. If you want to, we can defer that issue until staff's presentation.

MR. KIM: Yes, sir.

MR. KUO: When T.J. makes his presentation, he is going to discuss some of it, and

then if you still have questions, we have the staff expert here to answer your questions.

CHAIRMAN LEITCH: Okay, good. Thanks, Bill. I think you told us you were done about 10 minutes ago, right?

DR. SIEBER: You were trying to be done.

CHAIRMAN LEITCH: Well, we appreciate the additional information. Thank you.

MR. BOHLKE: You are quite welcome.

MR. POLASKI: So we are on Slide 13, and this is Fred Polaski.

We were asked to provide some information on major equipment replacements that have occurred at both Dresden and Quad Cities. Those are already discussed. Those are related to EPU.

This slide shows other major replacements that have occurred over the history of both plants. Reactor water cleanup piping at both sites, both plants, has been replaced with piping that has been resistant to intergranular stress corrosion cracking to eliminate that problem. At Quad Cities --

CHAIRMAN LEITCH: Fred, at that time did you change the location of the reactor water cleanup pumps in the system from cold to hot, because I noticed that the aging mechanism is all -- is the same

for all units, and I was wondering if the position of the pump was the same in all conditions? I mean not the physical position. I mean schematically in the system.

MR. POLASKI: I can't answer that. Rob, can you address that?

MR. STACHNIAK: The reactor water cleanup systems at Dresden and Quad Cities are of a different configuration, but when the piping was replaced, the pumps remained in the same locations. At Dresden there is a low pressure pump at the inlet side with recirculation pumps near the back end, pushing the water back. There's actually two pumps in the reactor water cleanup.

In Quad Cities, which is considered a higher pressure system -- Bill, can you help me. I don't know if you are familiar with the system operation, where the location of the pumps are.

CHAIRMAN LEITCH: There's some places you are using hot pumps and some places cold.

MR. PORTER: We've got the cold pumps, but I believe that was done before we changed out the material. I think that was already an earlier modification.

CHAIRMAN LEITCH: So the aging management

program is appropriate for the cold pumps?

MR. PORTER: That's correct. I mean, cold is a relative term.

CHAIRMAN LEITCH: I understand that.

MR. POLASKI: the next is at Quad Cities some of the RHR service water piping has been replaced. It was discovered early in operations in the mid-1970s that, due to an installation error, leaks were developing in the RHR service water piping, and it was repaired and then later about half of that piping was totally replaced with new piping to eliminate the problem.

DR. FORD: What was the mechanism of the leaking?

MR. POLASKI: The problem was, as I understand it, during initial installation when the pipe was being put in place, there were stanchions underneath the pipe to hold it in place while the welds were being made. This was underground buried pipe. Then when the trenches were backfilled, the stanchions were not removed.

So they wore holes through the pipe from the outside. So those areas where that had occurred, the entire pipe run was replaced with new piping in a different configuration.

DR. SIEBER: Piping like that usually has a fair amount of mic attack going on in it.

MR. POLASKI: This, as I understand, was just due to having left these construction stanchions in place, and it wore through from the outside. It was a mic issue.

DR. WALLIS: Did you see any mic issues at all in the pipe?

MR. POLASKI: I can't answer.

MR. BOHLKE: Mic has been a low level issue, not a high level issue, at Quad Cities since I've been there. Bill, do you have any other insights on mic, the extent of mic?

MR. PORTER: Bill Porter. No, if you look at the dates on here, this is in the mid-seventies. So the mic situation really had not had time to show up yet. Currently, we are still seeing some minor problems that we are looking at as part of our programs, and fixing them as we see them.

DR. SIEBER: These systems ordinarily have fairly low flow through them.

MR. BOHLKE: RHR service water we use for our shutdown.

DR. SIEBER: Right, but not during operation. So 90 percent of the time or 95 percent of

the time, flows are low. So the chemistry is hard to deal with.

MR. POLASKI: I guess the other thing on mic -- and I'm not sure of the exact details -- is I know the experience at some plants have a major issue with mic, just because of the water chemistry, and other plants it exists but it's never been an issue. So it varies greatly from plant to plant.

The next major change on Dresden Unit 3, and only Dresden Unit 3, we replaced the recirc piping again with piping that is not -- or resistant to IGSCC.

On the other three units, Dresden 2 and both Quad Cities units, piping has not been replaced. However, we have implemented stress improvement on the welds to eliminate or reduce the possibility of IGSCC cracking of those welds.

Main power transformer --

CHAIRMAN LEITCH: That is mechanical -- They are 304 stainless in those other three units, and you did the mechanical --

MR. POLASKI: Well, they have done both mechanical and induction heat stress improvement, as appropriate. So they have done both of those, and we are doing all the inspections required by 8801 and ISI

program. So far, that appears to have been a successful mitigation to the problems.

I guess also in that area -- and I'll jump to the last item on the list there -- we have installed and operate routinely hydrogen water chemistry at both plants. We have used zinc injection and noble metals injection to try to mitigate IGSCC, and that's been successful.

DR. FORD: Could I just follow up on that? On the staff's SER, they quote, "The applicant stated that inspection frequencies are only reduced in Unit 2" -- That's Quad Cities Unit 2 -- "where improved water chemistry has been demonstrated to be effective."

I assume that's hydrogen water chemistry. The implication here is that there were some systems where there was not improvement. Am I just reading something there?

MR. POLASKI: What that says is that we have not taken credit, because we haven't taken credit as allowed by VIP for reducing the inspection frequency because of water chemistry. So we still inspect as if we were not using hydrogen water chemistry

DR. FORD: Oh, okay.

MR. POLASKI: So even though we are doing the things to reduce the probability and the possibility of IGS, still inspecting as if those were not being implemented. So we are inspecting more frequently than we need to.

DR. FORD; Okay, but where there are defects -- Are there any defects at all in these systems?

MR. BOHLKE: You mean cracks left?

DR. FORD: Cracks.

MR. BOHLKE: Well, we have done several weld overlays in the period of time from 1998 to 2004 either as a result of what we have found and repaired during that outage or a preemptive weld overlay based on trends that we have seen. But we are still at the point where we are managing that issue, and we are comfortable with the weld overlay as an appropriate technique, as opposed to a wholesale --

DR. FORD: Okay, but you are relying on stress improvement rather than the hydrogen water chemistry or noble chem?

MR. STACHNIAK: Well, we have done stress improvements, and we operate hydrogen water chemistry, and we do nobel metals.

MR. BOHLKE: We've got all of those

things, but as our inspection programs become more refined, our ability to detect becomes more quantifiable, particularly with digital readouts from ultrasonic, we are able to more accurately identify, quantify, evaluate.

So that puts us in a program, but it's on a onesy-twosy basis as opposed to any wholesale repairs going back in. We think that is quite manageable.

DR. FORD: The reason I am asking the question is that noble chem is being fairly widely applied now, but we don't have an awful lot, given the time period, of inspections. Now I thought I read into here there was some situations where they were seeing crack propagation, and the answer to that is no.

MR. BOHLKE: That is correct.

DR. FORD: Could you go back and just talk to us about core shroud repairs? You jumped over it.

MR. POLASKI: Well, I was going to go back to it. Let me just get the other ones.

Main power transformer have been replaced at three of the units. The fourth one will be replaced in spring of 2005. So we will have replaced all of the main power transformers.

DR, SIEBER: But that is not the problem that is limiting your capacity, is it?

MR. POLASKI: Our capacity is limited by generator.

MR. BOHLKE: Lifetime of the transformer. It's the transformer.

DR. SIEBER: But that is not the limiting for the plant op. That's generator.

MR. POLASKI: Generators is the limiter.

Dresden Unit 1 fire main piping was replaced because of problems passing its required flow testing, and the Dresden Unit 1 fire main, because of the design with the two plants, and Rob will go into some more details as part of the overall fire protection system at Dresden. So that was replaced because of not being able to pass its flow testing.

On core shroud, we have IGSCC cracking in all four core shrouds, and we have installed the hardware that clamps the shroud in place to compensate for the cracks.

DR. FORD: That is going to be a permanent repair?

MR. POLASKI: Yes. Don't know any other plants right -- We have no plans right now to replace the shroud. That isn't being considered. So it's

permanent, and those hardwares are inspected routinely as part of vessel internal inspections.

CHAIRMAN LEITCH: As I recall, there is a TLAA associated with that hardware.

MR. BOHLKE: So it may be that to achieve a full sixty years we may have to go in and replace that hardware, but again, based on our inspections and our calculations of life, we would prefer to do it preemptively as opposed to reactively. That's basically how we are trying to manage vessel internals.

DR. FORD: And you won't be making a case that noble chem is protecting or stopping the cracks, regardless of the clamping?

MR. BOHLKE: Well, in the shroud itself, if you are not relying on the shroud weld for holding the top and the bottom of the shroud together, you are relying on the hardware. Your concern is that the hardware is capable of performing its function.

If it is holding the shroud in place in the proper compression, I don't know that you would see the crack propagation, because you shouldn't have the stress.

MR. STACHNIAK: This is Rob Stachniak. As I understand, the hardware repairs replace the

horizontal welds, if you will, in terms of the structural integrity. The inspections of the vertical welds, to my knowledge and memory from all the review at this time, have no indications on the shroud welds. Mike, can you remember from your review also if that is correct?

MR. HAYES: yes, you're correct, Rob. This is Mike Hayes. You are right. The clamps did replace the horizontal welds structurally.

MR. STACHNIAK: Thank you.

DR. FORD: The reason why I am pushing on this one, it was always my understanding that clamping method for repairing or mitigating a core shroud repair was never meant to be a long term mitigation action. Now that was my understanding, and maybe I am incorrect on that. Maybe we can ask the staff. Was I correct that the clamping option was never meant to be a long term mitigation action?

MR. ELLIOT: This is Barry Elliot. We have reviewed their BWR VIP program for the clamps, and we approved it. So it's a long term program.

MR. FORD: I'm mistaken.

MR. ELLIOT: Subject to inspection. There is an inspection program built into the BWR VIP program for the shroud.

MR. KIM: And as it was mentioned earlier, for license renewal there is a specific TLAA that addresses.

DR. FORD: Okay.

MR. POLASKI: Shall we go on to Slide 14. In addition to talking about replacements that have occurred, we'll talk a little bit about --

CHAIRMAN LEITCH: Just before you get too far into this, could you tell us about your ECCS pump screen modifications at Dresden and Quad Cities? I guess, ten years ago or so, most BWRs modified their screens. Was that done at Dresden and Quad Cities?

MR. STACHNIAK: Again, this is Rob Stachniak. Yes, the suction strainers in the suppression pool at all four units were modified and enlarged, and they are currently in place. Yes.

CHAIRMAN LEITCH: Okay, thank you.

MR. POLASKI: All right. So now we are on slide 14, taking a look into the future for equipment replacements. Exelon has developed what we call a long term asset management program that addresses long term issues with major plant equipment.

This includes both safety related and non-safety related equipment. Just some examples: Reactor and internals; reactor vessel heads, most

specific emphasis on the PWR heads; main turbine; main generator; a lot of other equipment. Those are just some examples.

This long term asset management program addresses various types of long term issues, including material degradation, obsolescence and also looking at plant improvements.

We set this program up to complement other programs that address equipment issues, things like our preventive maintenance program, performance centered maintenance, and our system health reports. The combination of all these programs provides us with a full coverage of both long term and short term aging issues.

I would also like to mention that the long term asset management program is an integrated program for all 10 Exelon nuclear units. So we get some information back and forth between the plants, and we use this as one of our major inputs into the decision making process on long term replacements, and it is part of our long term planning and budgeting process.

On slide 15, just to give you some examples of some of the things that were considered in here. This is just a list of some of the more major ones that we've got in the process. I will note, all

of these are preemptive issues, that we look at these preemptively based on data, an it provides us the information that we get into the planning process of when we should make these replacements, whether we should replace or refurbish.

So we are looking at things like main generator rewinds, turbine rotor replacements, I&C system upgrades, those kinds of things.

DR. SIEBER: What kind of upgrades are you talking about in instrument and control?

MR. POLASKI: Instrument control -- and all these are still considerations. WE haven't made decisions on these. It could be digital feedwater control systems, replacing the EHC system with a new, more modern digital EHC system.

DR. SIEBER: So you are not talking about a totally digital control room?

MR. POLASKI: No.

DR. SIEBER: You will do it system by system or loop by loop.

MR. BOHLKE: I wouldn't preclude that as a far future. I think we would like to move toward that, but per se, no. It's not the immediate focus. The immediate focus is addressing the becoming obsolescent analog systems with more robust, etcetera.

On the way, we can take advantage of things to try to modernize your control room, and that is being done not just for us, but across the industry.

CHAIRMAN LEITCH: Just a curiosity question. Is the main generator rewind -- would that kind of an operation get you up to be able to generate your licensed power limit or would that be a total generator replacement?

MR. BOHLKE: It is intended to be a rewind. Now we think we've got enough available density in the state of rotor to be able to use all of the licensed power, but then it becomes a question of the auxiliary's state of water cooling, things like that.

So again, it is an economic tradeoff. Is it worth the investment in everything else plus the rewind or should we just stay where we are, do a like for like rewind. We haven't concluded one way or another yet on that.

DR. SIEBER: What you are saying is you have enough iron.

MR. BOHLKE: Yes, we have enough iron. That's correct.

DR. SIEBER: Okay.:

CHAIRMAN LEITCH: So this is a list of

things that you are kind of thinking about and analyzing for the whole Exelon system, not specifically --

MR. POLASKI: You're right, and this is only a partial list. The overall list probably has 30 or 40 different topics on it that we consider on a fleet-wide basis for all of our plans to put together a long range plan.

MR. BOHLKE: And the most important part of all of this is that it is programmatic. It is not a hit or miss thing. It is laid out, and we examine it regularly and make decisions, because what we are trying to do -- Let's take one example.

If we said we had to do a major condenser tube replacement, that would inherently, we think, be a longer outage than some of the numbers that you have seen up there that I showed earlier. Well, if you knew you had an outage that was, let's say, twice as long as your normal outages, then you would take an opportunity to do some other things.

So that takes a lot more long term planning, and that is the kind of thing we are trying to do.

DR. SIEBER: But, really, to me, these kinds of lists are part of normal operations that

every plant does, and doesn't have any impact, one way or another, on license renewal.

MR. POLASKI: You are right. This is how we run the business, looking proactively into the future, not license renewal.

DR. SIEBER: It's the way you keep your asset viable.

MR. POLASKI: Yes. Okay, with that I'd like to turn the presentation over to Rob Stachniak who is going to discuss some aspects of the scoping process and also aging management programs and their alignment with GALL.

MR. STACHNIAK: This is Rob Stachniak.

Exelon was asked to provide information concerning several scoping topics that would be considered unique. The first of these topics deals with Dresden Unit 1.

Dresden Unit 1 was shut down in 1978 and is currently in a safe store condition. All of the nuclear fuel has been removed from the reactor vessel and from the Unit 1 spent fuel pool. All of the fuel is now in dry cast storage on site, as Bill showed you earlier.

There are a few Unit 1 systems that are maintained operable for support of Unit 1 activities.

However, there is one system in Unit 1 that does provide support to Units 2 and 3, and it was credited in license renewal.

That system is the fire protection system for Unit 1, which includes the underground fire protection supply header, the diesel fire pump, the screen wash pumps, and the building that houses this equipment, which we call the Unit 1 Cribhouse.

I might also point out that this equipment is included in the Unit 2 and 3 maintenance rule monitoring program.

I would now like to move on to Slide 17. The second scoping topic that I would like to talk about deals with the scoping of non-safety related piping. Interim Staff Guidance letter Number 9 provides guidance concerning the scoping of non-safety related pipe.

The ISG addresses two aspects of non-safety related scoping -- non-safety related system scoping. The first deals with the non-safety related pipe that is attached to safety. Specifically, the ISG recommends that you include all components of the non-safety related pipe up to the first seismic anchor.

The design of the non-safety related

piping systems for plants that are of the vintage of Dresden and Quad Cities did not incorporate seismic anchors.

Initially, our scoping effort at both sites included pipe and components up to the first support in each orthogonal direction, and that was later expanded to include pipe and components up to the second set of supports in each orthogonal direction.

DR. ROSEN: Before you get off that point, Rob, there is an open item -- or there was an open item related to this subject, the equivalent anchor question. Is that going to get talked about some more?

MR. STACHNIAK: Our proposed resolution was what we had just said here, moving the support or the boundary of the systems out to the second support in each orthogonal direction. After discussion with the staff, what we came down to was what is an equivalent anchor for the design of Dresden, and moving the boundaries out to two supports in each orthogonal direction ensures that, if the piping between the two sets of supports were to degrade for any reason, you would still maintain structural integrity back in the safety related attached portion.

DR. ROSEN: So the staff is going to close this item?

MR. KIM: Yes, sir, we are. Like you said, it is the subject of an open item, and we are going to be talking about that during our presentation.

MR. STACHNIAK: The second aspect of ISG Number 9 concerns spatial interaction between non-safety related and safety related components. Our initial scoping effort implemented at both sites excluded non-safety related equipment separated from safety related equipment by more than 20 feet.

As a result of the scoping and screening methodology audit and subsequent discussions with NRR, the physical separation criteria was later abandoned. Exelon has evaluated the impact this methodology change had on the initial scoping results.

Some additional piping systems were added to the scope of license renewal, and the final impact that this methodology change had will be reported to the staff very shortly.

CHAIRMAN LEITCH: Now as I recall, what you did at Peach Bottom basically, was if non-safety related -- If it was non-safety related piping in a building that contained safety related equipment, you

basically called it all in scope.

It sounds like initially here you attempted to do something less than that by -- depending upon the physical configuration of the equipment. But are you now going to just fall back to your Peach Bottom approach?

MR. POLASKI: Graham, let me explain the difference. At both Peach Bottom and at Dresden and Quad Cities, in the reactor buildings and also in the diesel generator buildings, any non-safety related water systems or any fluid systems were brought into scope.

CHAIRMAN LEITCH: Right.

MR. POLASKI: Peach Bottom had very little safety related equipment in the turbine building, and basically it was fuses that were isolation fuses between safety related and non-safety related. In those, we took the position that, if they got wet, leaked, sprayed on, they fail at the safe condition, which is the fuse opened up.

The Dresden and Quad Cities physical design is different in that there are safety related pieces of equipment in the turbine building, like 480 volt motor control centers that are safety related and sit in the turbine building in proximity to non-safety

related fluid systems.

We took the initial position at Dresden and Quad to look at a distance limit that said, if the non-safety related piping system was 20 feet away from medium energy, that was far enough that, if that pipe leaked and sprayed, we were far enough away that it wouldn't impact the safety related equipment.

We have since -- you know, after discussions with the staff, have eliminated that distance criteria, and we are bringing in additional systems or expanding non-safety related systems without any spatial -- without distance limitation.

So it comes down to a lot of -- The process was the same. It's just we had a lot of safety related equipment n the turbine building at Dresden and Quad Cities.

DR. ROSEN: So I'm sure you can appreciate and are cheering us on, but we are trying to write a letter this week on this, are we not? Oh, no. Okay. We've got time. So these issues really need to get closed out. I'm surprised at the lack of closure at this stage.

MR. KUO: Dr. Rosen, during the staff presentation, T.J. will discuss about it. Again, if at that time you have questions, staff will certainly

answer whatever the question you have. But this question had been subject to extensive discussion between the staff and the applicant.

DR. ROSEN: But we are actually seeing this in mid-process, I think, is what you are saying. The applicant is going to take certain actions, and staff is going to review them.

CHAIRMAN LEITCH: There are five open issues, but at this point there are five open issues in the draft SER.

MR. KUO: In the draft SER, right.

CHAIRMAN LEITCH: An open issue may mean at this stage -- It could well mean that the issue is essentially resolved, and what is awaited here is formal documentation and closure of the paperwork between now and the time the final SER is issued.

MR. KLUGE: Yes, I would say that will be the case for all five open items.

CHAIRMAN LEITCH: And we will hear some more from the staff on that. Okay.

MR. STACHNIAK: I would now like to move on to Slide Number 18. The next topic we were asked to discuss was exceptions to GALL.

The Dresden and Quad Cities license renewal application describes 47 different aging

management programs. Of these, 38 correlate to programs --

CHAIRMAN LEITCH: Rob, just before you get into that, I'm sorry to interrupt you. But again, I'm thinking back to Peach Bottom. You did some scope realignment of piping systems, and I guess I am trying to think of perhaps a compressed air system running through containment.

MR. STACHNIAK: Yes.

CHAIRMAN LEITCH: The compressed air system per se was not in scope, but you took that portion of the piping up to the isolation valve on either side of it and actually scoped that with containment, and included it in scope.

MR. STACHNIAK: That's correct.

CHAIRMAN LEITCH: Has a similar approach been applied here? Is that what you did here?

MR. STACHNIAK: The Dresden and Quad Cities scoping methodology did use that same criteria. We made very clear in the application for the staff on a system by system basis where we did that, so that it was easier for the staff to identify and recognize where we did that. Yes.

CHAIRMAN LEITCH: Okay. I had a little trouble finding that, but if that same approach was

used, I understand. That's fine. Yes.

MR. STACHNIAK: Of the 38 programs -- Thirty-eight correlate to the programs described by the GALL. Of those 38, we determined that 18 are consistent with no exceptions to GALL.

The remaining 20 programs are consistent with GALL containing some exceptions. However, in each case the exceptions contain alternative aging activities acceptable to the NRC staff. Let me provide you with three examples to offer some insight on what these exceptions are.

The first example relates to the BWR penetration inspection program. This program covers the inspection of standby liquid control and instrument penetrations on the reactor vessel.

The GALL specifies a volumetric inspection of the standby liquid control nozzle. The Dresden and Quad Cities ISI programs which cover these components, or this component, has a relief request to the ISI program.

The current program allows for a visual inspection of the inner radius of a nozzle weld, and that is attributed to the fact that the weld is not accessible to volumetric inspection equipment. Hence we have an exception.

A second example deals with the fuel oil chemistry program. In general, the exception for this program are the result of different ASTM standards recommended by the GALL versus those followed by each site. However, the ASTM standards followed by Dresden and Quad Cities do assure the quality of the fuel oil will remain high.

An example of an exception between the different standards deals with the size of filters used in the testing of particulates. The standard that Dresden and Quad Cities use, for instance, uses a much smaller particulate filter, .8 micron, versus 3 as recommended by the standard or the GALL.

The last example relates to the inspection of overhead heavy load handling systems. The GALL does recommend that the licensee track the number and the magnitude of lifts made by the heavy load handling cranes, such as the reactor building or turbine building cranes, and then review those lifts to ensure that the fatigue limits are not being approached.

There are administrative controls in place at Dresden and Quad Cities to ensure that the load lift capacities are not exceeded. Those administrative controls, however, do not record the number or the size of the lifts. However, the only

components large enough to approach the design loads of the reactor building cranes at either site are components such as the reactor head, the drywall head, the shield blocks, for instance, that cover the drywall during operation.

These components are only moved during reactor disassembly, and the heavy load cranes are designed for approximately 100,000 lifts at rated load. So our usage of these load handling systems will never exceed the limit, if you do out the math.

These are typical examples of the type of exceptions that we have cited.

DR. FORD: Okay, I was just about to ask the staff, is the question of this exception on the BWR penetration inspection -- will that be discussed?

MR. KIM: We hadn't specifically planned on it, but we do have a tech staff here present who can talk about it during our period.

DR. FORD: Okay, during your period then. It's just I am questioning how appropriate it is, just because you can't inspect it by volumetric, what is the risk?

MR. ELLIOT: This is Barry Elliot. I don't know -- what's your name?

MR. STACHNIAK: Rob Stachniak.

MR. ELLIOT: Rob is reading from the -- I believe, from their original application. We didn't agree with what was in the application. We told them that we do not approve relief requests as part of the license renewal process, and we requested that they commit to do the inspections according to the code, as far as the license renewal process, which would be a volumetric examination, and they have committed to do that.

Now when it comes to the time, if there is no techniques available to do the volumetric examination during the actual license renewal period, then we will consider relief requests. But we do not do that as part of this process.

DR. FORD: Okay. I understand.

MR. STACHNIAK: Thank you for that clarification. We agree totally.

DR. BONACA: I had a question regarding some exceptions, for example, in your fire protection program and your fire water system. I'm not sure my objection is about the exceptions you have taken. Maybe my concern is about the prescriptiveness of the GALL and how somebody who is in the middle like myself is left, when I see a negotiation.

The example is, you know, there are a lot

of exceptions you have taken regarding the frequency of the inspections.

MR. KIM: Yes.

DR. BONACA: Now you know, so GALL says you should perform inspection at least once every refueling outage, and you say you do it every five years. You should do inspections at least bi-monthly for holes in the skin of the door, and you do it once per cycle, so on and so forth, and they accept it.

Now when I read the GALL, I don't see that kind of elasticity in it, because it seems to be very prescriptive. Now either there is a problem in the way that GALL is too prescriptive, and maybe something has to be done to provide some considerations, or I am left with some kind of question in my mind. You know, how come?

If you really believe that it is so important to do it a regular frequency, why is doing it, you know, on a much less frequency always the acceptable?

MR. KIM: I think I can try to answer that.

DR. BONACA: Also, the water systems, and the testing of the water systems for the fire protection, the requirement for testing to design

pressure, and they don't do it, and you find it acceptable. So I am left with questioning on why is it acceptable, and here is some explanation, but not very much.

MR. KIM: Let me try to answer that, and I'm sure Dr. Kuo will correct me if I'm wrong here.

Yes, in some cases the staff has found that the GALL is very prescriptive. So there is an effort ongoing based on the license renewal application reviews that we have done -- Dresden and Quad Cities is the 14th one. There is a lot of experience that the staff has gained.

So there is an effort going right now to upgrade the GALL Report to incorporate some of the lessons learned, such as these.

As far as the individual exceptions that the applicant has taken on specific aging management programs, those exceptions were carefully reviewed by the staff based on justification that was provided with the application or to a response to --

DR. BONACA: In many cases, a response seems to be visible. But again, I have no sense -- I mean, in some cases I would expect the GALL expects more frequent inspection, because the plant is getting older. So in some cases one may say, no, we want to

have them more frequent, because.

This wasn't the case here, and I was left with this problem between the prescriptiveness in GALL and a lot of elasticity in the way that you reviewed it and accepted the longer intervals, lesser flows and so on.

MR. KUO: Dr. Bonaca, just to supplement what T.J. just mentioned, the update of the GALL is ongoing, and that is one of the objectives, to broaden the GALL criteria, acceptance criteria. So the case you just pointed out is one of them that may be too prescriptive. So we are trying to update the GALL to provide a range in the acceptance criteria, so that we don't -- the staff doesn't have to provide justification every time there is a small variation.

DR. BONACA: I believe that. Thank you.

MR. STACHNIAK: Now let's move on to Slide Number 19. My next topic is the chemistry of groundwater found at both sites and its impact on buried concrete structures.

The groundwater at each site is sampled once every five years, and shown on the slide is the historical range of the pH, the chloride and the sulfite values for the entire plant history. In each case, you can see that the values are not close to the

aggressive limits stated in Chapters 3 or 4 of the GALL for concrete structures.

DR. ROSEN: What has been your experience? I know you do a lot of work at these sties and, no doubt, have excavated the subgrade. What have you seen?

MR. STACHNIAK: Unfortunately, I don't have that information with me.

MR. BOHLKE: Elliott, can you comment on your respective sites about any underground commodity issues?

MR. PORTER: Bill Porter. Most of the excavation we do at the site is small, and we do it now with suction to make sure that we don't damage equipment and so forth. So is your question pertaining to the condition of equipment that we see or the chemistry?

DR. ROSEN: Concrete, mainly.

MR. PORTER: We have not found many concrete problems. We have some water leakage -- not leakage, but leech-age that is addressed, I think, in the report I saw, as far as looking in the buildings. But we haven't found extensive other problems with the excavation we have done.

MR. FLICK: This is Elliott Flick. It's

been a similar experience at Dresden.

MR. STACHNIAK: Now I'd like to move on to Slide Number 20. Finally, I would like to summarize the status of the open items and the confirmatory items contained in the draft SER.

The SER has five open items, and Exelon has provided a formal response to each of these. As of this morning, the staff considers one of the five open items as closed. The remaining open items are currently under review by the staff.

The SER also contains confirmatory items. All but one are closed, and the staff is reviewing the documentation provided to close this one remaining item.

As to the respective regional inspections and NRR audits, all technical issues have been resolved. There is one open issue from the regional aging management inspection concerning the adequacy of action tracking files associated with the license renewal commitments, and there is a follow-up inspection scheduled late in May to assess the corrective actions.

DR. ROSEN; So now your discussions on these four open items that are under review are ongoing with the staff? You have submitted responses

to them to their concerns that were expressed in RAIs, because these are -- Let me just characterize them as they struck me when I read them as fairly significant, not your run of the mill open items.

So there is some relative sense of unease I have compared to other applications with the importance of these open items.

MR. STACHNIAK: I understand. We have been submitting -- We have submitted responses to the staff and then discussed the responses and, if necessary, we have revised them and then provided the responses under oath and affirmation.

At this point in time, the staff has all of our answers, and there is one additional piece of information that will be provided next week regarding the scoping increases from the change in methodology. Other than that, we believe we have reached closure on everything.

DR. ROSEN: Reached closure? You mean you have the staff's agreement, you think?

MR. STACHNIAK: We are waiting for the staff's agreement, but we believe it is coming. Yes.

DR. ROSEN: Well, because these issues are -- For example, the upper shelf energy values for the limiting beltline materials -- now that's pretty

important stuff.

MR. STACHNIAK: We agree.

MR. POLASKI: And the calculations have been done for that and submitted to the staff that show that those numbers are acceptable. It's just a matter now of getting final review from the staff.

MR. BOHLKE: That title may be misleading. We are talking about one capsule in one Quad Cities unit.

MR. KIM: Dr. Rosen, we are going to be talking about those issues.

DR. ROSEN: Okay. We will hear more about those then.

DR. BONACA: I had a question here, more just for information, regarding scoping. In the service water -- in service air system and those things, the HVAC system, you have some non-safety related, two safety related components, and you did include in aging management all those components and scope that are Class I service components.

MR. STACHNIAK: Yes.

DR. BONACA: To the exclusion -- but you did not include the compressors. Could you explain to me how you divided that scope? It's just more for information than anything else. I did not understand.

MR. PORTER: So we are clear, you're talking about instrument air system?

DR. BONACA: Yes.

MR. PORTER: Instrument air, service air.

MR. STACHNIAK: In the case, for instance -- Let's discuss instrument air. From the compressors, all of the equipment that drives the air, up to those points of isolation where you now go into Class I, those systems were all designed as fail safe. In other words, their failure will place the plant in a safe condition, and it would not affect any safety function.

Therefore, we felt no need to put those pieces of equipment in the scope of the rule or apply any aging management for them.

DR. BONACA: By fail safe, however, does it mean that the isolation valves of the safety related system would close?

MR. POLASKI: The design is that isolation valves fail in a closed condition. So you don't need air to close them. Those components that require air to operate like main steam relief valve or main steam isolation valve -- the design is such that they have accumulators and check valves that isolate that part to the air system from the supply.

So the only part that is safety related is from a check valve to the operator on the valve, and that part is in scope.

DR. BONACA: Okay. And you did the same -- and they understand -- the same logic you used for the HVAC system for all the others?

MR. POLASKI: Yes.

MR. STACHNIAK: Yes. In the case of dampers and so forth, yes, absolutely.

DR. BONACA: Okay. I wanted to understand that.

MR. STACHNIAK: At this time I would like to turn the presentation over to Fred Polaski who will talk about commitment management.

MR. BOHLKE: Mr. Chairman, I think we have less than 10 minutes to go in our presentation. This should go fairly quickly.

CHAIRMAN LEITCH: Okay, good. Let's press ahead.

MR. POLASKI: On our use of the commitment management process for control of commitments on licensure, I am on Slide 21. I just want to clarify one thing on what I am going to talk about as far as commitments are concerned.

In the draft safety evaluation report in

Appendix A is a list of license renewal commitments. These are very high level commitments that align very closely to the aging management programs that we have credited.

What I am going to talk about on commitments are the actual implementing procedures and inspections that we are going to perform in the plant that actually implement those programs, and there's over 1,000 specific implementing tasks that we consider commitments, and each of these, we consider a specific commitment in Exelon's commitment management process.

These are also treated the same as any other commitments we have made to the NRC. It is controlled by a -- Our process is controlled by an Exelon procedure that is consistent with NEI Guidelines for Managing Commitment Changes," and all of these commitments are documented in the commitment tracking system database.

There is also as part of that process a formal process in place for review and approval of any changes to the commitments, which could include prior NRC approval.

We will go on to Slide 22 to discuss how we use the specifics of our commitment managing

process as it applies to license renewal.

We have assigned for each aging management program a unique commitment tracking number and a tracking file has been created for each procedure, work request, periodic surveillance, all of which, when I talk procedures, I am going to use an all-encompassing way that is more than just what you would consider a formal procedure, maybe a preventive maintenance active, maybe a work request, but we treat all of those, and we have annotated of them as commitments for license renewal in our commitment tracking process.

What I'd like to do then is just show you one example of how that works. So we go on to Slide 23. I am going to be talking about action tracking items, and we have an action tracking process that controls commitments, any commitments that come out of our corrective action process, commitments we make to the NRC, commitments we made as part of license renewal.

This process includes identification of issues, resolution, closure, and documentation of all of these, and these are tracked through what we call action tracking items or ATIs.

So if you take a look at the chart here --

and this represents it for Quad Cities, and there is a similar hierarchial setup for Dresden. For Quad Cities we have assigned one action tracking item, ATI #101562. It is the master action tracking item for license renewal.

We then have assigned sub-items for each of the aging management programs. For example, 101562.02 is the action tracking file for water chemistry; 101562.33, selective leaching; and .34 is the aging management program for buried piping and tanks, and I would like to use this as the example.

Each of these action tracking files at a program level is made up of implementing procedures. Water chemistry has 12, selective leaching 18. Buried piping, I believe, has 14, and they start out numbered .01, which is this particular procedure.

I am going to talk about .11, which is our procedure SA-AA-117, which is our procedure for excavation, trenching and shoring. So we will go on to Slide 23 -- or the next slide, 24.

This is actual steps and text lifted out of procedure SA-AA-117. Step 4.7 is a step for exposing underground piping, structural steel or concrete during excavation, and there are steps in here to notify Engineering to perform inspections when

these components are exposed because we are doing some excavation.

This entire step, 4.7, has several commitments attached to it. CM-4 is the one I want to talk about particularly for licensure renewal for Quad Cities.

The second page here is from later in the procedure, and this is our list of references. Under Quad Cities Reference 6.1.4 for Quad Cities is CM-4. This is action tracking item 101562.34.11. If you remember from the previous slide, that's the number that I showed you for this particular procedure, and it's the license renewal aging management commitment that references NUREG 1801 in the GALL procedure.

The next on this page is CM-5, which is also where we have committed to this a second time in another program. These are the two commitments for Dresden relating to license renewal, and this one, CM-2, is our commitment for the Peach Bottom license renewal application for license renewal. So this is a corporate procedure that is used at all 10 of our nuclear sites for doing excavating.

So we have used this in all of the plants, and I expect as we go forward and do other license renewal applications, this list, CM-2, 3, 4, 5 and 6

will just continue to grow as we credit this program for other license renewal applications.

So we go on to Slide 25.

MR. BARTON: Before you do, you said notify Engineering. Is there a sign-off? Is there a hold point? How do you know you notified Engineering to do the inspection, because I know of places where it says notify Engineering when you excavate something, because they are going to inspect piping, look for electrical penetrations or whatever. It hasn't been done, and there's been damage done, and the holes got covered back up. Everybody says, oh, Christ, the procedure or we screwed it up. How are you going to preclude that?

Just say notify in generic. Doesn't say, you know, hold point. There's no sign-off there. It's a note in the procedures.

MR. POLASKI: It's a step in a procedure that has to be completed, and it's notify --

MR. BARTON: It's steps, plant procedures for the same thing. Go back. Tell me how you are not going to miss that step. It's just a note.

MR. POLASKI: Well, no, it's a procedural requirement. Engineering inspect piping or structural steel for evidence of coating degradation or

corrosion, inspect concrete. So this step goes on. I didn't copy it all in here, but there's steps that Engineering has to do that work.

MR. BARTON: Is there a sign-off there for Engineering that they've done it or something?

MR. POLASKI: In this corporate level, I don't remember the exact --

MR. BARTON: Okay. Because I know this is where we get the same note and similar kind of procedures, and it hasn't been done at other stations. I'm not saying you've done it.

MR. POLASKI: Elliott would like to address that.

MR. FLICK; IN many of the cases we would have at the station level a station implementing procedure that references back to this procedure that would have the required sign-offs that would end up in the actual work package that's being implemented in the field.

MR. BARTON: Okay. This is not the actual work procedure. This is a higher level?

MR. POLASKI: This is the corporate procedure that implements the process, yes.

MR. BARTON: All right.

MR. POLASKI: So we go on to Slide -- This

is Slide 25. So this is the actual action tracking file for this procedure 101562.34.11, which provides information about what is done as part of that commitment. Here is the procedure that is utilized to do it, and the references to action tracking item 101562.34 which is for the program.

So if we go to Slide 26, I'm not going to walk you back up the ladder, if you will, in the hierarchial structure. So this is the ATI for the aging management program for buried piping inspections.

In here we have specific information, and this is a multi-page document within our database for commitment tracking. So I've just highlighted some of the more significant parts.

Again management activities are credited for components exposed to soil and/or groundwater. We then talk about the scoping. Buried ferrous portions of a significant number of different systems, and we are also looking at buried mechanical joint rubber gaskets that are contained in the fire protection piping.

Slide 27, we keep on going and talk about the aging effects for dealing with loss of material, change in material properties and how we manage that,

cuttings and wrappings, periodic inspections, and pressure testing.

For each of those, there is a significant discussion on how that manages aging. So here is a discussion for coatings and wrappings.

We go on to Slide 28. Here is a discussion for periodic inspections and pressure testing.

DR. BONACA: By the way, I really was impressed by this program.

MR. POLASKI: Pardon?

DR. BONACA: I was impressed by your program, because GALL only requires opportunistic inspections, and many applicants have really stood behind that commitment only. I think, although you have no aggressive groundwater, you have taken this seriously. I think this is impressive, that you have a program to do more than just purely opportunistic inspection. It may be something that GALL should consider.

MR. KUO: Sure thing.

MR. POLASKI: I guess, just to wrap up on the commitment process, we have taken an approach that the information that what we committed to in the license renewal application and in any RAIs will be

available through our plant staffs in the future. But what we have done is in these action tracking items take the significant things of what we are committing to, what aging effects we want to manage, how we are managing them, put them in this action tracking file so they are readily available to the staff engineers, so when they come up to a question of changing a procedure or there could be a commitment we've made where maybe techniques have improved and there's new and better ways to do things, they will have the references readily available to them as what we committed to in the past. And if they want to change that commitment to make some improvements, for example, they will have that information.

They can go back to the source documents, but they are rather extensive and voluminous, and this gives us the information that is important right into the procedures.

So any questions?

CHAIRMAN LEITCH: Excuse me, John, go ahead.

MR. BARTON: No, that's all right. I just thank him for an explanation.

CHAIRMAN LEITCH: As you know, one of the ACRS concerns is the implementation, the timely

implementation of these programs. I guess what concerns us is that, if one were to wait until the end of the current license period to begin the implementation of these programs, it would not only present an unreasonable burden on you but on the staff as well.

Can you make some comment now or, if not, when you come back to the full committee, could you make some comment about just what is the status of the implementation of these programs?

MR. POLASKI: I can do that right now. The majority of the aging management programs that are required for licensure already exist, and we have made some enhancements and improvements where we provide more information on the aging effect of the inspected techniques to be used. But a lot of those inspections are already being implemented.

We have added some new inspection programs, but if I characterized it on volume of inspections, probably 98-99 percent of all the inspections that we are doing are already existing in place today.

We are currently going through a process of building all of these action tracking items with all the information. The procedures have already

been annotated and/or changed, if they needed to be. So everything is in place.

We have already built into the work management program, addressed it in Quad Cities, these inspections, so that that information is in it. It was recognized not only the concern from what if you want until the last minute to do this, but we realized that for Dresden with the license expiring in 2009, we don't have a lot of time to get all those done, if there's new things, and to make sure that they are being done with the new criteria. So that's all been built in, so that it is not an unnecessary burden on the plant at the last minute.

You don't want to wait until the last minute to do any new inspections anyway. So those have already been built in. I'd say the majority of the new inspections are one-time inspections that we are committing to where we are doing that to be able to show to ourselves that the chemistry programs we have had in place have been adequate. We believe that they are adequate, but we are going to do these one-time inspections just to confirm it.

So all of this -- The only thing that is left to do for Dresden and Quad is to finish populating these action tracking item files so that

all that information that I showed you here exists for all of them. We are working through that. We expect to have that done sometime later during the summer.

CHAIRMAN LEITCH: Thank you. Did you have some concluding remarks or is that the end of your presentation?

MR. BOHLKE: So let me just summarize what we have -- the major points of the last couple of hours.

We believe we submitted a high quality application for the two stations, and one which we believe, including the discussion we have had, effectively uses the GALL Report, the first time we think the GALL Report have been used in a boiling water reactor license renewal application.

This is our second application. You can see how we are building in the program. We've got more teed up. We will be here again.

The staff has performed a very thorough review, and I'm sure if you have gone through the draft, you have seen the depth of their comments. It is a thorough review. We have had very comprehensive and probing inspections with positive interactions with staff at the stations.

We have developed what we believe are

strong aging management programs. We have given you a hint of that. Fred just talked about that, which are in place to take us through extended operation, and for the programs that we have deployed, our experience and feedback from those systems so far has been positive and substantiates that they are well designed.

Again, we touched on this long term asset management program which gives us the strategic approach to make sure that the plants overall are being effectively maintained, high material condition, for purposes of being safe and reliable generators of electricity.

Thank you for your time this afternoon and your many probing questions. That concludes the Exelon presentation.

CHAIRMAN LEITCH: Okay, thank you. Does any of the committee have any questions at this time? You fellows are still going to be in the room, though, for the next part of the presentation.

MR. POLASKI: We will be here.

DR. BONACA: These plants must have been SEP plants. Right?

MR. STACHNIAK: Yes. Dresden Unit 2 was an SEP plant. Correct.

DR. BONACA: And not Quad Cities?

MR. STACHNIAK: I do not believe so.

CHAIRMAN LEITCH: Okay, let's take a break until quarter to three, and we will resume with the staff's presentation at that time.

(Whereupon, the foregoing matter went off the record at 2:25 p.m. and went back on the record at 2:41 p.m.)

CHAIRMAN LEITCH: Let's come back in session now, and we will turn it over to the staff for their portion of the presentation. T.J., are you going to begin?

MR. KIM: Yes.

CHAIRMAN LEITCH: Okay, good. Thank you.

MR. KIM: All right, Mr. Chairman, members of the Committee, thank you very much for this opportunity.

My name is T.J. Kim, and I am the lead Project Manager for the staff responsible for coordinating staff review of the license renewal application from Exelon for Dresden and Quad Cities. With me at the table is Kimberley Corp. She is another Project Manager who has been helping me out on this review, and Laura Kozak from Region III is also here, who is going to speak to inspection related

issues later on during the staff presentation.

Let's go to the next slide, please.

This is an overview slide, and I believe Exelon had touched on most of the issues that are covered here. I just want to briefly mention that the application, which actually covers both Dresden and Quad Cities, is a single application. I just wanted to clarify that.

It was dated January 3, 2003, and 2957 megawatts thermal represents or reflects the uprated power level, 17 percent for Dresden and 17.8 percent for Quad Cities, as it was mentioned earlier.

CHAIRMAN LEITCH: T.J., do you have any comment on considering license renewal applications where the plants are somewhat dissimilar like this? As I did the review, I found it a little bit confusing, but probably not as confusing as it would have been to do two separate applications, because I'm talking about the difference between RCIC and isolation condenser and shutdown cooling versus shutdown cooling just being a mode of RHR.

So there are a number of places where I thought it was a little tedious, because you have to keep bouncing back and forth: Is that Dresden? Is that Quad? But yet I think the overall efficiency was

probably better this way than doing it twice. I was just wondering about your thoughts.

MR. KIM: Yes, I would agree with you on that. There are enough -- Obviously, there are some differences between Quad Cities and Dresden, but there enough similarities, and obviously they are the same vintage plants, and with enough similarities I think it is far more efficient to have a single application, and with the highlighting the differences, as they have done. I think that was very efficient.

MR. BARTON: I would agree, T.J. I think it is probably the best way to submit this application, even though you had some differences and back and forth. I look at this, and I say, well, you know, one coming down the pike which is going to be two different BWRs which are really different. Nine Mile and Fitzpatrick, I think, are coming in on the same application, aren't they?

MR. KIM: I don't think so.

MR. BARTON: Two Nine Mile plants or something?

MR. KIM: Well, Nine Mile 1 and Nine Mile 2 might be coming in.

MR. BARTON: And they are different plants.

MR. KIM: Yes.

MR. BARTON: That is going to be even more challenging than this.

MR. KIM: That's right, but in the case of Dresden and Quad, I would say what they have done is a pretty efficient way to do it.

CHAIRMAN LEITCH: Okay.

MR. KIM: Next slide, please.

The points on this slide was also mentioned earlier, but let me just go through that real quickly. The current licenses expire for Dresden Unit 2 in 2009, which is obviously about five years away. So it's really not that far. Dresden Unit 3, 2011, and Quad Cities 1 and 2, 2012. Exelon has requested 20-year extension to the current operating licenses for all four units.

DR. ROSEN: And there is the answer to the question earlier. Both of them on the same day, Quad Cities 1 and 2?

MR. KIM: That's correct. That's correct. It is somewhat unusual, but that was the case for Quad Cities.

As it was mentioned earlier, Dresden and Quad Cities' application for license renewal is fourth in a series where they have modeled their application

after the recommendation of GALL Report. Fort Calhoun, I think, was the first one, Robinson, Summer, and then Dresden-Quad Cities. Next slide, please.

At the time the draft safety evaluation was issued back in February, as you know, there were five open items and 16 confirmatory items. I think it's -- There were some questions about the timing of the issues, when they were first raised, and that kind of stuff. So let me -- I think it is worthwhile to cover the timelines very briefly.

Of the five open items, four were generated from staff RAIs, and one came up during an inspection. All five issues were surfaced, if you will, around July 2003 time frame. So I would say we did have ample time, both the applicant and the staff had ample time to address those issues.

Another perspective that I would put on the table here is that through the staff's review, we have initially issued 265 RAIs by about July 2003 time frame, and applicant responded to all 265 RAIs by early October, October 3rd, I believe.

Then, obviously, staff went through the licensee's -- which were a lot of RAIs, 265, went through in a relatively short period of time, and the staff was able to issue 265 issues down to about 100

right around November-December time frame of 2003. Then by working very closely and judiciously with the applicant, by the time the draft SER was issued in February, we were able to get it down to five open items.

MR. BARTON: How does 265 compare to the other GALL applications?

MR. KIM: They are right there with other GALL applicants. I think Ginna had a little bit less, like 225. I'm just going by memory here, obviously, and Robinson, I think, had about 300 RAIs.

MR. BARTON: I'm just wondering, you know, since people are now coming in with GALL whether the RAIs would go down, but sounds like they are all about the same.

MR. KIM: Another thing you have to keep in mind, though, as I mentioned, Dresden-Quad Cities was the fourth application following the GALL format, but actually when they start preparing the application it was all around the same time. So I don't believe -- Maybe Exelon can correct me if I am wrong here, but I don't believe they had the time to incorporate lessons learned from, let's say, Fort Calhoun or Robinson, for example, because they were fairly close together.

CHAIRMAN LEITCH: I think the hope for reduction in RAIs caused by following the GALL process has only occurred, if at all, to a very limited extent. I think what we are really hoping to see is the new procedure, which I guess we will see the first cut of that at Farley, I think it is.

MR. KIM: Right.

CHAIRMAN LEITCH: Where a lot more of the review activity is done at the site and, hopefully, some of these RAIs which may actually be trivial or misunderstandings or something like that, can be resolved before they get to the RAI.

MR. KIM: That's exactly right. Our management, as you know, is working very hard at bringing in those efficiencies through the new process, starting with Farley-A in '02 and DC Cook.

MR. LEE: This is the first batch, Fort Calhoun and Robinson addressing GALL? It's the first batch that have time to adjust to the GALL model. So they are down to 275, 250. Before, we are like in the 300, 350. So it's down a little bit. Then the next batch is the Farley, DC Cook, and the indication we have for Farley right now, less than 175. And that's the first one and, hopefully, the number will come down after Farley.

CHAIRMAN LEITCH: Thanks, Sam.

MR. KIM: And while we are on the subject, let me get on the soapbox a little bit. Efficiency is very important. Like I said, my management is really trying hard to address that issue, but I just wanted to point out that, while the staff is doing the review, I think, it is very important to keep in mind that we want to maintain a questioning attitude, on the other hand, along with the efficiency, to make sure the staff is continuing to do a very thorough review and inspections with license renewal.

CHAIRMAN LEITCH: Well, as I look to the SER on pages roughly 70 through 90, there were a number of RAIs there, shutdown cooling, RHR, reactor water cleanup. And it looked like many, many of those were small pieces of piping associated with those systems that in Unit 1, for example, were not included in the scope, and Unit 2 were or Dresden, it was, and Quad Cities, it wasn't. And it seemed like the answers frequently came back, oops, we just forgot to highlight this or we highlighted it in the wrong color.

MR. KIM: That's correct.

CHAIRMAN LEITCH: I guess it just gave me a feeling that maybe some of that work had been done

in a careless fashion perhaps. I don't know if you had any of that. So I mean, it looked a lot of those RAIs that were generated were quite easily answered, but they were just little mistakes. I'm not talking main piping. I'm talking little drain piping or other vents and things like that that seemed to be just some questions about consistency. Did you have that same reaction?

MR. KIM: Yes. As you pointed out, many of the staff's RAIs on scoping and screening portions of the application were about the differences between Quad Cities and Dresden or between the units within the same station, where one unit, for example, a piece of piping included in the scope of license renewal, whereas the same system, same piping was not.

In many cases, those turned out to be an error on the applicant's part, and in hindsight perhaps they should have done a better QA review of the application.

MR. BARTON: Well, there was a similar one in Section 2 that we talked about earlier on reactor and cooling water which is similar to that, where it was not an RAI and the staff didn't pick it up, but yet in the LER they talked about reactor and closed cooling water systems at both Dresden and Quad Cities,

and there's a reference table of items in those systems that are, you know, in the aging and has been programmed, and under -- in that Table 331 it lists tanks.

Now you think about what tanks are in the RVC-CW systems. Well, the only one I can think of is an expansion tank. But yet, if you look at the table, it says Dresden only. You say, well, isn't there an expansion tank in Quad Cities, and is the tank in scope or not, and it's really not that clear. You know, why is it Dresden only and not Quad Cities? It's a similar thing. You guys didn't pick it up in your SER, and it was not an RAI.

So I wrote it down as something that I didn't understand.

MR. KIM: I don't have an answer for you on that.

MR. BARTON: I'll give you my comments. You guys can look into it. It's Section 23. It has to do with the RVC-CW system described in the LLA and the table that it references to the components. It says tanks, but it says Dresden only, and you know, maybe they are not even talking about the expansion tank. I don't know, but I don't know any other tanks in the RVC-CW system. So, to me, it's another kind of

issue that Graham brought up.

MR. KIM: Okay.

MR. BARTON: It's in my notes. You'll get a copy of them.

MR. KIM: Okay. We'll take a look at that. Thank you.

Since the application, there are a few systems and a number of additional components that were brought into the scope of license renewal by the applicant as a result of the staff's RAIs and open items that we talked about earlier, especially the open items that touches on the scoping issues.

So the list is still increasing in terms of the additional systems and components that are being brought into the scope of license renewal, and there is one piece of that the applicant is still working on right now to get us the latest information.

As a result of staff's inspection and audit and the staff's review, the applicant added four new aging management programs since the submittal of the application. I am going to go over those later in the presentation.

CHAIRMAN LEITCH: I had a question about a document that we received dated March 5, '04, about the FSAR update.

MR. KIM: Right.

CHAIRMAN LEITCH: And there's a number of things that have changed over the time that the application has been pending.

MR. KIM: Right.

CHAIRMAN LEITCH: And they are documented in this document. I guess this came in after the draft SER that was reviewed. So it does not reflect these things.

MR. KIM: Obviously, the March 4th memo that you -- or letter that you are looking at was not reflected in the staff's draft SER which was issued back on February 14th, I believe.

Now that letter that you are referring to, I believe, is a further requirement of Part 54 where we require each applicant to update on an annual basis any new -- any changes to the current licensing basis that may materially affect the application for license renewal.

CHAIRMAN LEITCH: Right. That is usually one of the standard license conditions, more or less.

MR. KIM: Yes, sir.

CHAIRMAN LEITCH: The last paragraph of that letter said something that was confusing to me. It says -- It's just a format issue. It's not a

technical issue. It says, "The pages revise the result of this annual update also reflect those changes due to RAI responses that affected the same pages. Because Appendix A is provided in its entirety, all RAI related changes are included in the Appendix. However, changes to other LRA pages that resulted only from RAI responses are not included in the annual update." It sounds very confusing. It sounds like--

MR. KIM: I think what Exelon did there is, as part of that submittal to update their licensing basis changes since the application, what they have done was they included entire -- revision to Appendix A to the original application, which is a USFAR update for license renewal in its entirety as a result of all the RAIs and things like that.

So, basically, they combined two issues into a single document.

CHAIRMAN LEITCH: It sounds like that they were reviewing the pages. If they are revising the pages anyway, they did, but if they weren't revising the pages, they didn't. I just don't understand.

MR. POLASKI: This is Fred Polaski at Exelon. Let me try to clarify that.

When we respond to RAIs we receive from

the staff, that can result in changes to the information that's in the license renewal application.

CHAIRMAN LEITCH: Sure.

MR. POLASKI: Just based on answers to RAIs, we do not revise the application document. So that the document actually is the original application plus all RAI responses. We don't go back and update the pages or the document that the NRC has.

CHAIRMAN LEITCH: Right.

MR. POLASKI: When we went through the process of looking for changes to the plant, changes to the current licensing basis, which is the annual update that we are supposed to do, which materially impacts the application, those pages that were affected because of changes to the plant that we submitted to the NRC as part of that letter, we not only included the changes to the plant which impacted the application, but we also included changes that would have occurred to those pages based on RAIs.

So that when the staff got those revised pages, they included the original information as modified by RAI responses plus the annual update. So that the staff wasn't getting one document that didn't have RAI responses, another one that did, to try to eliminate confusion from that.

CHAIRMAN LEITCH: If you guys understand that, that's fine. But it seemed to me that you are going to have some pages now with RAI -- with the information from the RAIs updated, if it happened to fit on that page, but if it is on another page, the RAI information would not be updated.

MR. POLASKI: Well, like I said, we have not -- and I don't believe any applicant has -- continuously updated the application with RAI responses, so that the application includes the application plus all the other changes.

It was a decision we made just to try to avoid confusion where the staff would get a revised page or page with revisions in it, and then they looked at it and said, well, why didn't you include the information you gave me three months ago in an RAI response. So we included those.

CHAIRMAN LEITCH: Well, if you fellows find that helpful, it's certainly okay with me. I am just somewhat confused by it. That's all. I don't have a technical problem. It's just a formatting issue.

MR. POLASKI: I guess the other part to that was we had seen what we consider a fairly significant number of changes to the program

descriptions in Appendix B which was going to go in the FSAR. So we chose -- and we had built these up, and this was a good time -- to resubmit that whole section to the application to say this is as we see it today, and this is what we will implement in our next biannual update to the FSAR; because there had been a lot of changes to those program descriptions based on RAI responses, and we needed to get those in front of the staff as to what those were going to be like.

So rather than doing piecemeal, we just saved them up and did them all at one time and decided to submit it with the annual update at the same time. So you get two totally separate things in the same submittal letter to the NRC.

CHAIRMAN LEITCH: Okay. Thanks, Fred.

MR. KIM: Next slide, please.

Okay. In addition to the in-office tabletop reviews conducted by the staff -- By the way, for license renewal application review, we have over 30 technical staff within the Office of NRR that's involved in the review, and in addition to that, we have contracted subject matter experts from three different national laboratories, BNL, Argonne, PNL, for example. So we have substantial brain power, if you will, behind doing the review.

What this slide shows is that, in addition to those tabletop reviews, we have conducted a number of audits and inspections as part of the license renewal program. Let me just go through that real quick.

We've done a scoping and screening methodology audit where we focused on applicant's source documents in developing their methodology. That was done back in May. Then NRC Region III inspection staff has done a team inspection of scoping and screening results.

Then NRR staff did an aging management program audit back in October. Then Region III conducted a team inspection looking at the aging management review and aging management programs from the implementation aspect or perspective, if you will. That aging management inspection was done one week at Quad Cities on site and another week it was done at Dresden on site.

We have recently, back in March, conducted an optional inspection which Laura Kozak is going to talk about a little later, and we are also planning a follow-up inspection in May-June time frame.

So this summarizes all the inspections and audits.

CHAIRMAN LEITCH: Now is Laura going to talk about some of these inspections? I have a couple of questions here.

MR. KIM: Yes, sir.

CHAIRMAN LEITCH: Okay.

MR. KIM; Okay, next slide, please.

Section 2.1 of the application addresses the scoping and screening methodology. In the staff's review, this includes in-office review plus the audit that I mentioned earlier that was done back in may at the applicant's engineering office.

The staff focused on whether the applicant has met the criteria addressed in the rule itself, 54.4, and also we focused on the criteria that was outlined in the staff's SRP plus the NEI's 95.10 guidance on scoping and screening.

Based on that review, we have identified two open items which, by the way, Exelon talked about earlier. Let's go to the next slide, please.

CHAIRMAN LEITCH: Could you just go back?

MR. KIM: Sure. We are going to talk about the two open items

CHAIRMAN LEITCH: Okay, go ahead.

MR. KIM: Again, these were briefly mentioned earlier by Exelon. The first issue deals

with the spatial interaction of non-safety related system piping on nearby safety related components.

Initially in their application, the applicant took a position that anything beyond 20 feet -- It's a non-safety related piping separated from the safety related component by more than 20 feet were okay from any potential spraying concerns, an the staff has challenged that thought and asked -- or through RAIs asking for justification.

That took a lot of time going back and forth, question and answers, and eventually it became an open item, and as you heard earlier from Exelon, they have changed position, and now they are going back and relooking at the methodology to include much of -- In other words, they excluded -- They took out the 20 feet separation criteria that they had used and, thus, they have included -- brought in a lot more system piping into the scope of license renewal.

As a result of that, they are still developing the additional systems and piping components that are going to be brought into the scope. Okay, that's the first issue.

The second issue for scoping methodology came up during Region III's inspection where an inspector identified licensee's methodology in

addressing license renewal boundary for non-safety related piping attached to the safety related piping.

Initially, the applicant took a position -- took an approach that, since as you heard before for addressing Quad Cities and for plants of that vintage, they don't have seismically qualified pipe anchors, if you will, on the non-safety related portion of the piping that are attached to the safety related piping.

Thus, they took an approach where they, I think, used the term equivalent anchor, where they took the license renewal boundary out to the first pipe restraints or supports in each orthogonal direction, if you will, and included up to that point the non-safety related portion of the piping into the scope of license renewal.

The staff challenged that, primarily asking the applicant to confirm that position as consistent with their design and licensing basis, and based on the staff's prompting, the applicant has done a much thorough-er look-back at their licensing and design basis and came back and said the licensing basis seemed to indicate that they should take the license renewal boundary out to a second equivalent anchor, if you will.

So that is the latest position that Exelon

has provided to the staff, and staff has looked at it, and we are satisfied with that. Again, as a result of that change in methodology, additional components or pipe segments are being brought into the scope of license renewal. Yes?

CHAIRMAN LEITCH: The scoping and screening inspection, I thought, had two open items, one having to do with the topic you just discussed. The other one says at the close of the inspection, the applicant was evaluating the switchyard buses for inclusion in the scope of the rule. Has that been resolved?

MR. KIM: Yes. Laura Kozak is going to address that.

MS. KOZAK: This is Laura Kozak. It was listed as an open item in the scoping and screening inspection. It was part of the RAI process at the same time. If you read that through, it says that we will evaluate that in the aging management inspection.

It was evaluated, but it was never documented as closed. So in our third follow-up inspection, it is documented as closed. It was within the scope and did receive an aging management review, and that is documented through the RAI process also.

CHAIRMAN LEITCH: Okay, thank you. So

that issue is closed now?

MS. KOZAK: Yes. That issue is closed.

CHAIRMAN LEITCH: Was this issue part of this issue that most applicants seem to be having problems with; that is, how much of the switchyard should be included in the scope of license renewal? Was that the issue or is it something else?

MS. KOZAK: To my knowledge, this was a separate issue.

MR. KIM: Well, I think the issue that you were thinking of stemmed from one of the ISGs addressing the station blackout. That's a separate issue.

CHAIRMAN LEITCH: Okay. My question was really, hasn't that ISG resolved this issue? I'm surprised to see that is still coming up, but I guess it's not the same thing. It's a different issue. Okay.

DR. ROSEN: These plants have station -- AT least one of them -- Maybe they both have station blackout diesels.

MR. KIM: They both do.

DR. ROSEN: Right. So the issue was different here than it has been elsewhere. But I didn't see any discussion in the application or the

SER of there being issue relative to that ISG. If that went through the switchyard configuration with the station blackout diesels, then it's okay.

MS. KOZAK: That's right.

CHAIRMAN LEITCH: There wasn't enough detail in this. I didn't really understand. It just said switchyard. I wasn't really clear what the issue was. Thank you.

MR. KIM: Okay. Any other questions? All right, I am on Slide Number 9, and Section 2.2 of the application addresses a plant level scoping results. This is at a high level system and structures.

Staff's review of this section did not result in any open issues or confirmatory items.

CHAIRMAN LEITCH: Now I remember talking about scoping of structures, there was a problem at Quad Cities about eight years ago where a tornado came through and ripped some panels off the reactor building and sheet metal panels were flying around and coming down into the switchyard or had the potential to come down into the switchyard. I don't remember if they actually did or not.

I think what they found was that these panels were -- They were not intended to be blow-off panels. They were intended to be blow-out panels.

They were supposed to open, and there was some kind of a device, like a spring-loaded device, that hadn't been maintained, and I guess it went for years and years, and then the tornado came along, and they didn't release, and it tore the panels off.

I just didn't see any -- I thought these devices might have been in the scope for structures. Do you recall if that came up at all?

MR. KIM: Not personally.

CHAIRMAN LEITCH: It's a detail, but it did present a fairly significant problem at that time. You know, if we don't know the answer to it now, I think maybe at the full Committee meeting, I'd like to hear some more about that.

MR. KIM: Yes, sir, we can follow up on that.

CHAIRMAN LEITCH: Unless the applicant knows anymore about that situation.

MR. KIM: Was there any damage done to the superstructure or it just --

CHAIRMAN LEITCH: No, as I recall, it was just the sheet metal panels that tore off the side of that.

MR. BARTON: It's got something to do with the fasteners weren't installed or weren't installed

right or something was wrong with them, and that's how the panel blew out.

CHAIRMAN LEITCH: Yes, I thought it was -- You know, I mean, I'm thinking about an aging thing where they hadn't been properly looked at or maintained.

MR. BARTON: I don't remember whether it was that or they weren't installed or something, because I remember we had to go and look at ours. So the NRC put something out as a result of that.

MR. KIM: We will definitely follow up on that for the full Committee meeting.

MR. BARTON: If it's an aging thing, you wonder why they didn't include it in the scope then.

MR. KIM: That's the question. We'll take a note of that. We will get back to you.

CHAIRMAN LEITCH: It was on the reactor building, just sheet metal panels.

MR. KUO: Super structure.

CHAIRMAN LEITCH: Right.

MR. KIM: Okay, slide Number 10, please.

Section 2.3 of the application addresses scoping and screening results for mechanical systems. That includes reactor vessel, internals, RCS, ESf, auxiliary systems and steam and power conversion

systems. There were no open or confirmatory items.

CHAIRMAN LEITCH: Now there was one thing here that really puzzled me, and I'll find my note here in a second. But at one of the plants, the turbine auxiliaries were not in the scope, and in the other they were. Here it is. The SER on page 2-40 says the turbine oil main generators and auxiliaries screen in at Quad Cities only, not at Dresden.

I can't imagine why they are in at one place and out in the other.

MR. KIM: Okay. I need one of my technical staff to confirm my understanding, but I think that is because I think it was scoped in for Quad Cities. Right?

CHAIRMAN LEITCH: It was.

MR. KIM: Right, and that was because of the proximity to a safety related equipment in the turbine building. I believe it was a breaker, safety related breaker that is located within close enough proximity that licensee has to scope that system in.

MR. POLASKI: This is Fred Polaski. Those differences were because of scoping for a non-safety related could interact with safety, and just different plant configuration brought in different non-safety related equipment from one plant to the other.

CHAIRMAN LEITCH: Okay. Thanks.

MR. KIM: All right, next slide, the dreaded steam dryer issue. Let me talk high level of where we are in terms of reviewing this issue, and I might ask Dave Terao of our technical -- Mechanical Engineering Section Chief to supplement my comments.

In license renewal space, steam dryers, as with steam separators, are not generally in the scope for license renewal. As you are well aware, they are a non-safety related component, and up until now we haven't seen any operating experience that suggests these dryers could fail in such a way that we have seen at Quad Cities.

The staff -- Based on last three years of experience at Quad Cities and Dresden, the staff has determined that Quad Cities and Dresden, to some extent, are unique among other boiling water reactors. What we mean by that is the design of the steam system, main system steam, including the dryer plus the steam line configuration and the size of the steam line, for example -- I think, at Quad Cities -- correct me if I am wrong -- the steam lines are 20 inches in diameter, much smaller than typical other boiling water reactors which are in the 25 to 26 inch in diameter, which causes, obviously, much higher

steam velocity and, in turn, putting more load on the steam dryer.

So that's what we mean by the staff -- Based on what we know right now, it appears that Quad Cities is unique in this regard.

DR. WALLIS: Well, maybe there are many other ones that are unique, because they all have particular features. So perhaps -- Vermont Yankee may be unique, but the question is unique in what way. Does it promote failure of certain parts or not?

MR. KIM: Well, as I said, one thing that is clear so far is that the size of the steam line at Quad Cities is much smaller than other boiling water reactors.

DR. WALLIS: I guess, if you look very carefully at any plant, you are going to find something that's different.

MR. KIM: Oh, sure. Sure.

DR. WALLIS: I'm not quite sure what you mean by saying it is unique.

DR. FORD; It is my understanding that General Electric has done an analysis of all the steam dryer designs to see whether this in fact is unique. Do you happen to know what the results of that evaluation were?

MR. KIM: I'll ask Dave Terao to address that.

MR. TERAO: This is David Terao. Yes, I'll try to answer that.

Actually, by unique what we are talking about are a couple of things. One is that the sensitivity of the team dryers, the failures -- You are right. G.E. did do a sensitivity assessment, and it turns out that Quad Cities and Dresden are the most susceptible of the BWRs.

DR. WALLIS: Oh, so they are uniquely susceptible.

MR. TERAO: Yes. Well, that is one aspect of it, because they have a square-hooded dryer. They also have a very high main steam flow velocities. I believe it is 200 feet per second, which is much higher than what we typically see. Usually, high velocities would be about 150 feet maybe to 175 feet per second.

The other aspect that we find unique about Quad Cities is that it is the only steam dryer that we know of that has catastrophically failed to generate the loose parts. We have to recognize that other steam dryers have had cracking throughout, even before power uprates, usually due to IGSCC and sometimes

fatigue, but these type of failures are just usually small cracks.

Sometimes, like in Susquehanna, we found that they had a rather large crack within about a year from when they initially started operation, and recently Nine Mile Point 2 has had an 18 inch crack in their steam dryer. But these are relatively small cracks.

Nine Mile 2 was -- it was just along the weld and maybe about an eighth of an inch wide. There was blow-through, but it certainly wasn't the type of opening that we had seen at Quad Cities, and it certainly did not generate any loose parts.

So from that aspect, we feel that Quad Cities -- There's something different going on at Quad Cities, and we haven't put our finger on what it is. Exelon is doing -- is currently performing testing to develop data and running the Quad Cities units above EPU power to take some data to try to understand the loadings better on the dryer.

So we have yet to see the results of this testing. So we believe from that aspect the dryers are unique at Quad Cities, and that typically for other BWRs all we see are just very minor cracks that don't generate loose parts.

DR. FORD: But so we don't really know what the margin is before you go into some sort of resonance at this particular E-2 -- or Quad Cities compared with other plants, and you are quite correct. There have been other stress corrosion cracking problems in various subcomponents of the steam dryer, and also the attachment welds to the pressure vessel, which gives rise to the question as to what about the loose parts, including the whole steam dryer.

We brought this up, oh, two years ago. I seem to remember the categorization of it not being a safety related item. I think it was VIP-04. One of the documents categorizes this as not a safety related item. But no one seems to address the loose parts analysis as not being a particularly important thing, and I can never understand that disposition of that particular problem.

MR. TERAO: Well, as far as the loose parts go, you are right. There is a BWR VIP document. It is Number 06, which addresses -- It's more of a -- I'll call it a cascading effects due to -- from failures, and it looks at the different components inside a reactor vessel.

It was actually addressed as part of the IGSCC cracking. So it looked at all the safety

related items within the vessel. It also looked at the steam dryer as well. In addition, there was a discussion about loose parts in the VIP 06 document.

The staff accepted the VIP 06 document, but at this point the BWR VIP is reassessing that portion of their document, and we expect to see the results of that, if there is going to be a revision, I believe, sometime this spring or this summer.

CHAIRMAN LEITCH: The SER, draft SER, page 248, says -- summarizes, I guess, in summary fashion. It says, "The steam dryers are not in scope, because loose parts will not interfere with the ability to isolate the main steam line."

If we've found loose parts on the turbine stop valve springs --

MR. TERAO: The staff is revising that portion of the safety evaluation.

CHAIRMAN LEITCH: Okay. It sounds like this is still a pending issue, and this is one of the ones that we will absolutely need to get clear what the final situation is when we have the full Committee meeting on this docket.

MR. TERAO: That's correct, and I believe in the first week of May the staff is going to be giving a presentation to the ACRS on steam dryers and

EPU failures that we have seen so far, a status of where we are today.

DR. WALLIS: So what does that second bullet have to do with the first one? If they are not in scope, you don't have to worry about them? What does the second bullet have to do with the first one? To change the scope in some way?

MR. TERAO: Well, what we are saying is that, if we didn't have the loose parts being generated at Quad Cities, and if we only had the cracking at Quad Cities that we see at other BWRs, and certainly the failure of the steam dryers, the cracking of the steam dryer alone cannot affect the functioning of safety related SSCs. If that is the case, then it is not within the scope of license renewal, even though steam dryers are non-safety related.

DR. WALLIS: So the steam dryers are not in scope for Dresden like this or are the jury still out?

MR. KIM: It is an evolving issue right now.

DR. ROSEN: Only the parts of steam dryers that end up in the bottom of the vessel or in the main steam isolation valves --

DR. WALLIS: Or somewhere else.

MR. TERAO: I do want to point out -- Let me just that this issue, of course, the failure of the steam dryers, is an issue that cuts across operating reactors, EPUs, as well as license renewal. We are not trying to resolve it as part of license renewal. We are trying to resolve it as current issues, and Exelon, as well as the staff, certainly does not want to operate their reactors generating these loose parts for another 20 years.

MR. KIM: Absolutely. Thank you, Dave, because that is the point I was trying to make. The staff fully recognizes this is a very serious issue, and we are closely following Exelon's corrective actions in this regard.

As you may be aware, Exelon has submitted a letter to the staff on April 2nd, I believe, making various commitments, one of which was to hold a power level, reactor power level, at Quad Cities, both units of Quad Cities, at the pre-EPU level and conduct numerous tests to figure out what is causing the problem, and then develop appropriate corrective actions accordingly.

Now let me say this, though. It depends on how this issue evolves, and it depends on how the

staff concludes what the right way to go. In license renewal space, if there are any long term commitments that are made to address this issue by Exelon, then those commitments may very well carry over into the license renewal term, as appropriate. But as Dave mentioned earlier, this is a current operating issue, and we are not going to -- That is not going to wait until year 2009 for Dresden, for example, to address this issue.

CHAIRMAN LEITCH: The only thing that is not a current operating issue is whether the dryers are or are not in scope, and I don't know that we can productively discuss that much further except to say we need to hear a definitive answer to that when we come back to the full Committee.

MR. KIM: That's right.

DR. WALLIS: As far as coming into scope, if they come in scope for these, then why not for the other license renewals which are coming along; because I'm not sure --

CHAIRMAN LEITCH: That's when you get to the second issue, just are these unique, and how unique are they or is it a generic issue?

DR. ROSEN: Well, you are arguing that it wasn't the EPU that necessarily caused these issues.

It was just aging perhaps, and I think you are right. There is no -- It's not clear which of these things.

There is only circumstantial evidence that it was related to the EPU.

DR. BONACA: One thing I would like to say, though. On a general level, as I pointed out this morning, it is very hard to segregate license renewal and modifications of the plant, because again the practical experience that is being credited for in all these programs may be somewhat less applicable in some cases, just because the plant is operating in a different regime and different temperatures and flow rates and so on.

MR. KIM: That's right. That's a very good point.

DR. BONACA: And you pointed out this morning that you would --

MR. KIM: Address that or try to address it. let me say this. It is very true. Especially the extended power uprates are a fairly recent development, especially when you talk about power uprates in the range of 17 percent, 20 percent. I believe the NRC has started approving those in early 2000, and addressing Quad Cities, I believe the approval went out in 2001, if my memory serves me

right.

So there is -- The bottom line is there is a very little operating experience with extended power uprate. That is very true. Having said that, the way the staff approached review of license renewal application for Dresden and Quad Cities was to make sure that all the parameters, operating parameters, reflected the 20 percent uprated conditions.

So we looked at very closely their aging management review section of the application to make sure -- and there are numerous RAIs that went out just to confirm, for example, reactor vessel embrittlement issues: Have you considered embrittlement at the 20 percent uprated power level versus the original level?

So we took great care in making sure that the licensee's application reflected the true condition of the uprated power level. That is one aspect.

I also wanted to mention that -- you may be aware of this -- Office of Research at NRC is -- or has been conducting research on potential synergistic effects of large power uprates combined with aging, for example. I think they also include high burnup issues and increasing the uprating cycle.

DR. BONACA: Well, they were planning to

study it.

MR. KIM: Yes. My understanding is that that has been funded, and the research program is ongoing. So, yes, we are fully -- the staff is fully aware of the potential issues that are out there and, as we learn more, we do have a process in place, like ISG, for example. As we become aware of these potential issues, we will screen those issues out and develop corrective actions accordingly.

DR. FORD: If I could just make one last plea. It seems as though you are readdressing this question about the steam dryer and the consequences of failure. When you do that in evaluation, you just don't concentrate on vibration, but you look at all of degradation, stress corrosion cracking, the effect of vibration on stress corrosion cracking; because those modes will not be mitigated by noble chem or hydrogen water chemistry in the top head.

MR. KIM: Right. But the problem here is that this dryer was not even looked at, because it was screened out in the scoping process.

DR. FORD; I know, but my understanding is you are going to relook to see whether it should not be in the scope.

MR. KIM: Yes, sir. That is correct.

DR. FORD: And as you go through that process, then bear in mind those other physical phenomena.

MR. KIM: Absolutely. Absolutely.

CHAIRMAN LEITCH: Okay, let's move on. I think we've spent enough time on this one.

DR. ROSEN: Except for the bottom line, the bottom line being when is the license renewal application scheduled to be approved?

MR. KIM: Final SER is scheduled to be issued by July 26th for addressing Quad Cities, and the ACRS full Committee meeting would be roughly a month after that.

DR. ROSEN: So the end of August, say.

MR. KIM: The end of August or early September is probably when.

DR. ROSEN: We are going to have to have some sort of resolution to these issues or at least some sort of hook to put into the letter on steam dryers by then.

MR. KIM: Let me just throw this out. There is a possibility that, if we can't come to a resolution on this issue by that time, we may explore an option of putting in a license condition in the license renewal relative to the steam dryer or the EPU

related issues. I don't know what that is going to be right now.

CHAIRMAN LEITCH: I think you have had a concern in this area, and I think we ought to just move on here or we will not have time for the rest of the discussion.

MR. KIM: Okay. The next section, Section 2.4 of the application, specifically addresses scoping and screening of structures, and in addition to the containment structures, the application addressed 15 other structures like reactor building, turbine building, control room, cribhouse and so forth.

Staff has no open or confirmatory items.

MR. BARTON: Let me ask you on that. In that section there is a discussion on drywell corrosion, refueling floor seals, bellows, etcetera. As I understand what you have written in the SER, is that the applicant has agreed to do some UTs, I guess, of the drywell plates.

MR. KIM: Yes.

MR. BARTON: To look for corrosion, and also has committed to monitoring the sand bed drain lines during refueling flood-up.

MR. KIM: Yes.

MR. BARTON: All right. I got a problem,

because I think just monitoring the sand bed drain lines during refueling flood-up is not going to really tell you much, because experience where people have had leakage between the bellows on the refuel floor and the drywell plates and the sand bed have resulted from a small amount of leakage over many years, and you do not find gushers running out of sand bed drains.

What you do find is small cracks in bellows or the welds, the attachment welds of the bellows to the steel in the refuel floor. All right? Top of the drywell.

I don't understand how what the applicant has proscribed as his looking at this satisfied this, because there could be corrosion going on there for years and years and years, and you are not going to see water running out of sand bed drains.

They also committed to do some UTs, and I'd like to know what UTs they are going to do and how do they know what the UTs are going to do really shows the results of any corrosion that is going on.

I know the way we found there was corrosion going on is by actually drilling eight-inch holes or 23-something-inch holes and sending little people in to remove sand to find corrosion on drywell

plates, and you do UTs at the plate and you find out, oops, you know, my plate is going away.

So I don't know what has been proscribed here as the program, how you are satisfied with it.

MR. KIM: Okay. My recollection is the staff accepted that issue based on the licensee's commitment to do a UT exam. But let me ask Hans Ashar.

MR. BARTON: Tell me all about this UT exam.

DR. BONACA: It was done last year, right, in 2002, I thought, a commitment?

MR. KIM; Yes, I think so.

DR. BONACA: To perform UT?

MR. KIM: Yes. Hans, can you address that?

MR. ASHAR: Let me start this way, that we did address a number of RAIs to the applicant regarding this particular issue, because their experiences is in only one area, and that is in Dresden 3 they had experience, some corrosion in the area of the sandpocket area, which has been done in Oyster Creek in that area.

Because of that experience, they found that they also had corrosion in that area. Now the

probable cause for that water coming into the sandpocket area is, as explained before, something went from the refueling cavity into the vertical part of the drywell and into the sandpocket area on a long term basis.

Now that is the reason we tried to get something more from the applicant: What is the root cause for happening this? The applicant in response told us that, hey, we have a little different layout of the refueling cavity as well as the bellows and the way the plate is attached, and they did not think that that was the main cause of the water, but they could not at the same time explain as to where the water came from in that Dresden 3 event.

They don't have that kind of experience on Dresden 2 or the Quad Cities 2 or 3 -- Quad Cities 1 or 2. Now so we said, okay, but it appears that there is likelihood that this can happen, and what can happen is that the water leaking through the reactor cavity would go into that area of the vertical part of the drywell in the insulation area, and it can clog up the insulation. It can -- On a long term basis, it can create corrosion on the side we don't see in regular service inspections.

That is the reason the applicant committed

to perform UT examination of one unit out of the four units.

MR. BARTON: Well, but where is the UT proposed -- that he proposed to do going to be done? On what section of the drywell is the UT going to be done?

MR. ASHAR: Yes. Only at the first part of the -- The applicant said that they will be doing -- I don't know exact number. I read it in the SE, but I don't remember now. But it was close to about 15 random places in the vertical area, and then we said, hey, why don't we do something in the spherical area, too, because that is also subject to the same type of phenomenon.

MR. BARTON: Well, see, the corrosion really occurs in the spherical area which is buried in wet sand.

MR. ASHAR: Oh, yeah.

MR. BARTON: That's where you have the most corrosion.

DR. BONACA: This is not in the future. In Appendix B under the program, it states that the UT inspection is scheduled for the second half of 2002.

MR. BARTON: It's been done.

MR. BONACA: So it's been done. So there

should be some data with the information about it.

MR. ASHAR: Oh, I think we are talking about the -- The UT part of the hole is being committed in this commitment under license renewal. What they have done earlier was to look at the sandpocket area and cleaned out the drains from the sandpocket to make sure the water goes out in case it comes at all.

The second part is the area of the drywell area between the concrete and the drywell -- vertical part of the drywell and some part of the spherical area. That is the part I am addressing right now, and what they committed to under license renewal during the extended period of operation. Am I clear in what I am saying?

MR. BARTON: Yes, but I don't think -- You know, I'm not happy with what you are saying, because I don't know that you have proven that there is no corrosion going on in the spherical area or the plates that are sitting in maybe wet sand.

MR. ASHAR: Oh, you are still concerned about the sandpocket areas?

MR. BARTON: Yes.

MR. ASHAR: Sandpocket areas -- they only found --

MR. BARTON: Did they take all the sand out of there? What did they do? Why won't there be any corrosion in the sandpocket area? If there is a leak up above coming down the vertical side and it hits the spherical part and lays in the sand, why won't there be corrosion?

MR. ASHAR: As a matter of fact, for that area the applicant is given a TLAA on that one.

MR. BARTON: Given a what?

MR. ASHAR: TLAA, a time limited aging analysis in 472, Section 472. Okay? And time limited aging analysis says that the way they have performed the time limited aging analysis, they have taken the corroded part of one particular unit, and that is the only place they have found the corrosion. And they said that from up to 60 years -- even if they don't do anything. That's what they are telling us. But they are going to have a inspection program on a regular basis for that area, if whatever is happening in Dresden 3, is it being expanded? Is anything happening to it?

They are also going to clean up the sand drain area to make sure the water does not stagnate in that area to cause corrosion. So there are a number of things they have done in that TLAA. They are

expanding that TLAA.

MR. KIM: So it is a combination of time limited aging analysis where the applicant has -- Based on the inspection data that they have so far on the sandpocket area, of the UT data, they have projected what the corrosion rate --

MR. BARTON: Over 60 years, and they will still have enough plate?

MR. KIM: Right, and then they are going to confirm that with a periodic UT examination.

MR. BARTON: Of where? The vertical walls?

MR. KIM: No, no, no, the sandpocket area. Correct?

MR. ASHAR: The sandpocket area.

MR. BARTON; How do they do UTs of the sandpocket area?

MR. ASHAR: Let me explain a little more. The sandpocket area is visible. They can take out the sand and look at the surfaces as much as they want to do, and they have done this, because it has been found -- I don't even know what year, but it was been found earlier, and they are monitoring it for a long time.

MR. BARTON: So they got sand removed and they have access to the plate, and they can look for

corrosion?

MR. ASHAR: They can look by regular examination, yes. That is correct. They make an access for that particular problem, yes.

MR. BARTON: I don't know how they are doing that. Well, what are the access ports? Can you guys answer this question?

MR. KIM: Yes. Exelon?

MR. STACHNIAK: Yes. This is Rob Stachniak. Okay. Dresden Unit 3: In the lower portion of the drywell, in the spherical portion of the drywell, in the area that is surrounded by sand, sand that can be wetted, there were 22 locations all throughout the bottom of the drywell in which the cement was core bored down to the liner, and then UT thickness checks were made of the liner in that susceptible location.

MR. BARTON: So you went through the floor.

MR. STACHNIAK: Absolutely.

MR. BARTON: And so you got the inside of the plate?

MR. STACHNIAK: Yes. Based on measures we made, they were originally compared against the drywell liner thickness. They actually showed nominal

thickness hadn't changed.

Following that, we had numerous readings, I believe, every outage, on this 22 locations, and those results are included in the draft SER. All those thickness measurements are in the draft SER.

In addition to those, we committed to doing inspections of two other areas or general areas, I should say, of the drywell. If you remember, the containment is shaped like an upside down light bulb.

MR. BARTON: Right.

MR. STACHNIAK: We are doing inspections, UT thickness checks of the plate in the upper cylindrical walls and in the spherical wall below that, directly adjoining below that. Does that answer your questions?

MR. BARTON: Yes, I understand what you are doing.

DR. BONACA: So this must be the augmented UT inspection that is stated here?

MR. STACHNIAK: Yes.

MR. BARTON: But there is no intention to do a one-time of the bellows area, look for cracks or whatever?

MR. STACHNIAK: The bellows design is shown so that when the bellows is flooded -- If there

were a problem, there are drain lines in which you could detect the leakage. Yes, and that is all we provided the staff.

MR. KIM: Next slide, please. Section 2.5 of the application addresses electrical and I and C components. Applicant addressed these components in a "spaces" approach, and they basically grouped all the components, electrical and I and C components, in three commodity groups, and there are electrical cables and connectors, things like splices, connectors, fuse blocks, terminal blocks.

Then the second commodity group that they have identified is bus ducts, and the third commodity group that they have identified for aging management review is high voltage transmission conductors and insulators.

In this area, the staff identified no open or confirmatory items.

So to summarize our review of Section 2, scoping and screening, other than the two open items that we have discussed earlier about methodology issues relative to two over one considerations, the staff is satisfied that their scoping methodology and the results of scoping and screening satisfy the requirements of the rule as well as the criteria given

in the SRP and the NEI Guidance 95-10.

CHAIRMAN LEITCH: The SER on page 2-105 discusses the CRD hydraulics, and the pumps are included for Dresden only. I guess I am not sure why the CRD pumps are not in scope for Quad Cities unless it is a spatial issue as well, but I would think the CRD pumps --

MR. KIM: Those are on the reactor building.

CHAIRMAN LEITCH: I would think they would be in scope per se.

MR. KIM: Right. Can anybody from the staff answer that question? This may be an item that we are going to have to get back to you on. Exelon?

MR. POLASKI: This is Fred Polaski from Exelon. On Dresden, CRD pumps were included in scope, because they were credited, as per Appendix R on fires, as a high pressure source of water into the reactor vessel, were not credited for Quad Cities. So they come in under A-3 criteria.

CHAIRMAN LEITCH: Say that again, Fred. Tell me about Appendix R again on Dresden.

MR. POLASKI: One of the criteria for scoping under 54.4(a)(3) is fire safe shutdown, Appendix R. Dresden credited the CRD pumps as a

source of water to the reactor vessel under Appendix R scenarios. Quad Cities did not. So it's not a system interaction with the other one. This is A-3 for fire safe shutdown.

CHAIRMAN LEITCH: And the other thing similarly, I guess, the SER on page 2-113 talks about reactor water cleanup and the pumps. The pumps do not appear to be in scope. Now I know that the pumps themselves, the rotating part of the pumps, are active, but I thought the pump casings would be in scope, and I just wonder if -- The pump casing are not listed there as being in scope.

MR. KIM: Can anyone from the tech staff address that? Or Exelon?

MR. STACHNIAK: This is Rob Stachniak. The pumps were initially excluded because of spatial interaction. However, the pumps were put in the scope of the rule as a result of one of the RAI responses, specifically crediting high NG line break, and it deals with an RAI concerning -- I forget the words here -- dealing with accidents, non-design basis accidents credited in the CLB and high NG line break was one of those.

So we included that after the application was approved. So those pumps are now, yes.

CHAIRMAN LEITCH: Okay, thank you. I guess I had another scope question, I guess, if that's what we are dealing with now. On page 2-39, the oscillation power monitor. It says it is not in scope, because it is not enabled. I guess my question was perhaps not exactly scope, because I would think that is probably an active compounding anyway and probably would not be in scope.

It raised the question in my mind, how come you've got an oscillation power monitor that is not enabled? I thought that was what we were doing to prevent instability or are you preventing instability some other way by operator actions or how are you addressing that situation?

MR. BOHLKE: All of those where we have installed oscillating power monitors, the initial installation was for alarm only until we work through the generic issues that I believe you are aware of on the algorithms through which enabling for the actual control of the unit would be worked out.

Now that that has been worked out generically, seeing from us a succession of applications which would cause those to be enabled typically after refueling. So I've participated in two reviews in the last month on those, and I don't

think either of those were at Dresden or Quad, but they are on the way.

So they will be coming in through the LRA route staff review. Probably you won't see them, but that is how we are working it.

CHAIRMAN LEITCH: So those are likely to be activated, I guess, is what you are saying.

MR. BOHLKE: Yes.

CHAIRMAN LEITCH: But even if they are activated, it wouldn't be in scope, and that's not the reason they are not in scope. they are not in scope because they are -- It says they are not in scope because they are not enabled, but really they are not in scope because they are active. I mean active as differentiated from passive.

DR. WALLIS: Well, if they are not enabled, they are passive.

CHAIRMAN LEITCH: No, no. We need another word. Active as differentiated from passive.

DR. WALLIS: They must be in scope if they are not enabled, because then they are passive.

MR. KIM; We will follow up on that one.

DR. SIEBER: Well, it sounds like there's two reasons why they aren't in scope. That's how I interpret it, one because it is an active component,

the other one is it's not in service.

CHAIRMAN LEITCH: That's correct.

DR. SIEBER: When you put it in service, it becomes in scope except for the fact that it is active. So it's not in scope.

DR. WALLIS: So the only time it is in scope is when it doesn't work.

DR. SIEBER: It's just like the steam dryer.

MR. KIM: Go ahead and move on? Okay. Let me turn the floor over to Laura Kozak from Region III who is going to go over the inspection related issues and findings.

CHAIRMAN LEITCH: I must say, I find this inspection to be an important part of this process.

MR. KIM: Yes, absolutely.

CHAIRMAN LEITCH: It really helps give me confidence that things are okay.

MR. KIM: Right.

MS. KOZAK: Hi. My name is Laura Kozak. I am from Region III. I am the current lead inspector for license renewal inspections in Region III. I joined the Dresden-Quad Cities second inspection, the aging management program inspection, and I became the team lead for the effort after that inspection when

our previous team lead retired from the agency. So that is kind of my history with license renewal inspections.

This is the first Region III application. So it is our first opportunity to implement the inspection program for license renewal.

So I just have a few slides here to go over the results of our inspections and also to review current performance under the reactor oversight program.

CHAIRMAN LEITCH: Could you skip to number 20, please, Laura? I think the intervening ones are material that we are familiar with. It's just the process.

MS. KOZAK: Sure. Number 20, sure. Yes, a lot of it is gone over already.

The aging management program inspection, which is the second inspection -- Our overall results are that the material condition of both facilities was being maintained adequately. We did not find any signs of significant aging effects.

We did find that the documentation in support of the license renewal application was good quality and understandable and useful to us in our inspections.

We did complete a third optional inspection. T.J. also mentioned this. There were four open issues from the aging management program inspection, three of which had to do with specific aging management programs and the actual implementing procedures for those programs.

The fourth issue had to do with the accuracy of some of the action tracking items that are tracking the changes to the implementing procedures. The three technical issues are the issues associated with the programs. We were able to go out in March and close all three of those inspection open items.

The fourth issue associated with the action tracking items, you heard Exelon folks discuss. They had told us that they were going to do a full review and update of the action tracking items, and when we went for the inspection in March, they really had only completed a small portion of that activity.

So we wanted to wait until they had gone through and done a sufficient amount of the programs in the action tracking item so that we could sample that. So that is currently scheduled for May 24th.

CHAIRMAN LEITCH: Okay. Now in the scoping and screening inspection report on page 33, it speaks about the Dresden Number 1 cribhouse structure.

We talked about an issue similar to this before, but I'm still not clear.

It says there that it is necessary -- It is a diesel driven fire pump necessary to support the operation of Units 2 and 3. Yet it is not in scope. Why not?

MS. KOZAK: I don't have the answer to that offhand. I would have to go back and look at what we have written.

CHAIRMAN LEITCH: Okay. It's on page 33 of the scoping and screening inspection reports.

DR. ROSEN: Is this the jockey pump issue again?

CHAIRMAN LEITCH: Well, I don't know. Some of these things keep coming around, Steve. It sounds like it might be part of the same thing.

MS. KOZAK: Well, it does house the fire pump, which is in scope. That's true. Can Exelon answer the question offhand?

CHAIRMAN LEITCH: Sure.

MR. POLASKI: This is the issue -- This is Fred Polaski. This is the issue Rob talked about earlier on Dresden 1 equipment. It supports it.

CHAIRMAN LEITCH: Yes.

MR. POLASKI: The Dresden 1 fire pump, the

Dresden 1 screen wash pump both supply the fire protection system. So the building that houses them, the Unit 1 cribhouse, is in scope also. So all those are in scope and subject to aging management, and they are covered also by the maintenance rule program.

CHAIRMAN LEITCH: Well, maybe I'm misreading this thing then. Well, it says -- I'm reading page 33 of the scoping and screening inspection report. It says the Dresden Number 1 cribhouse contains one of the two diesel driven fire pumps required to support Unit 2 and 3 fire protection system.

Then it goes on to say the remaining structural component of the cribhouse is outside 10 CFR Part 54 rule requirements and, therefore, is not in scope. The team agreed with this decision.

Now it's not that they are saying the fire pump is not in scope. It sounds like there is a structural part of the cribhouse that is not in scope. I guess I'm just wondering why that is the case, if the fire pump, diesel driven fire pump, is apparently required -- It says it is required to support 2 and 3 fire protection system. Why wouldn't the structure that houses those be in scope?

MS. KOZAK: I understand your question.

I just don't have an answer for you.

CHAIRMAN LEITCH: I don't need the answer right now, but it's still --

MR. BOHLKE: As you know, any cribhouse or screenhouse structure is a series of bays. So the bay that is affected is in -- the pump is in with it. The remaining structure is how we cut the pie up. We think that adequately manages any aging effects for that component and supporting structure.

CHAIRMAN LEITCH: Yes. Maybe if I clearly pictured what this structure looked like, I might readily agree with you, but I just don't.

MR. POLASKI: This is Fred Polaski. Graham, I think what confused me was when they called it a cribhouse. Think of it as a pump structure, and it's got multiple pumps, diesel driven fire pump, service water pump, emergency service water pump, circulating water pump, each in separate bays.

So for purposes of Dresden 2 and 3, the only equipment in --

CHAIRMAN LEITCH: It's only got one bay.

MR. POLASKI: It's that one bay, that one port to the structure. So you may have other parts of the building which house circulating water pumps for Dresden 1 which is not in use. So that part of the

building isn't in scope of the rule, because it doesn't support any functions.

CHAIRMAN LEITCH: Okay, that's a good answer. That's fine. I understand. I think some of my problem is the term cribhouse is a little foreign to me. We used to call them screenhouse.

DR. WALLIS: It's okay if the rest of the building collapses?

DR. SIEBER: The pumps are in bays, but the bays -- the top of the bays are open, and then there was a sheetmetal roof on the top, and it seems to me that to have the bay intact, the roof has to be there, too, and the roof is continuous for the whole building. So I'm not exactly sure how you separate one bay from the rest of the building. The rest of the building can fall down and the roof can come off, but we're okay. It's just not clear.

CHAIRMAN LEITCH: Well, the staff looked at it and was satisfied.

MR. BARTON: That doesn't say much. That doesn't help me.

MR. KIM: We'll go back and take another look at that.

CHAIRMAN LEITCH: The other question I had: Quad Cities, particularly, used to have a

problem, and maybe they still do, with the Mississippi River leaking into the -- I shouldn't say leaking. I should say seeping into the ECCS rooms, condensate pump, pit rooms, anything low down in the bowels of the plant.

A lot of cables run along the walls. I guess in your inspection, which included, I guess, a physical look at the plant --

MS. KOZAK: Yes, that's correct.

CHAIRMAN LEITCH: -- did you notice any material condition issues on those cables with respect to those? It's not a gusher of water. It's almost like a stalactite that drips down.

MS. KOZAK: Groundwater in-leakage. We did specifically on our walkdowns take a look at that, and I can tell you from past resident inspector experience, it's something that is always looked at. Is this just a cosmetic thing or is this something that has a potential to affect safety equipment.

CHAIRMAN LEITCH: Yes, that's exactly my concern.

MS. KOZAK: Right. We did not during our walkdowns for this inspection find any issues that would be affecting equipment. It was all cosmetic.

CHAIRMAN LEITCH: Okay. Do you think that

it will stay cosmetic for 30 more years?

MS. KOZAK: That's a good question.

DR. ROSEN: If you answer that question, let me have your crystal ball.

CHAIRMAN LEITCH: I guess it's an unanswerable question. It's not a fair question, no.

I know that Quad Cities is well aware of the problem as well, and has tried to fix it, but without a whole lot of success.

MS. KOZAK: Right. Periodically over time, you know, it gets worse, and then it gets cleaned up. Then it starts to degrade, and then it gets cleaned up again. So I think that's kind of how it is approached.

CHAIRMAN LEITCH: There are cable trays supported off the walls. You know, if it was allowed to proceed without some housekeeping and careful attention, I would be concerned that there could be a buildup of this gorp onto some of those cables and cable trays or perhaps the attachments of the cable trays to the walls.

MR. BOHLKE: If I could interject, the structural monitoring program has that as an attribute for inspection.

CHAIRMAN LEITCH: It does?

MR. BOHLKE: The other thing, in response to that, making it sound like the river is flooding the building or whatever, about 2000 we put forward quite a substantial effort, and you probably were on site when we did that, Laura, to go in and redo the cut drain channels to the condensate pump room floor so we could take water away through a drainage system, take away the standing water which was just a real housekeeping issue.

Since then, we have these additions where the water table -- We don't at this time see any permanent effects, but we'll keep our eye on it. As I said, it is looking at things like the connections of the cable tray to the wall.

CHAIRMAN LEITCH: Good. thanks, Bill. That helps. Thank you.

MS. KOZAK: Good. Well, that is all the slides on the inspections. The rest of the slides are on the current ROP performance. So unless anybody has any other questions on the inspections right now, then I can talk about the ROP performance.

CHAIRMAN LEITCH: I did hear you say that there is still one day more of inspection in May or something like that?

MS. KOZAK: That's right, in May there is

an inspection to follow up on the accuracy of the action tracking items for the implementing activities.

CHAIRMAN LEITCH: Thank you.

MS. KOZAK: If you would want to just go to Dresden 3 slide for the ROP performance, Dresden 2, Quad Cities 1 and Quad Cities 2 are all in the licensee response column of the action matrix. Our slides here only show the performance indicators, but I can tell you that the inspection findings also are green for those facilities.

Dresden 3, which is up now, is in the regulatory response column of the action matrix, based on the White Performance Indicator for the high pressure injection system unavailability. That was previously discussed.

There was also a parallel inspection finding that was also White associated with that issue. In the ROP, though, if it is the same event or underlying cause, it doesn't get double counted.

DR. WALLIS: Just to be clear on this. This was an event where -- It was not available. So they got a bad mark, and this stays with them, even though they fixed it, for a certain period of time.

MS. KOZAK: That's true.

DR. WALLIS: Because they are waiting it

out is all.

MS. KOZAK: That's true.

DR. WALLIS: This doesn't mean that they are in any way defaulting or anything.

DR. ROSEN: It's three years.

DR. WALLIS: Just waiting it out is all that's happening.

MS. KOZAK: Right.

MR. BARTON: What is the gray box? I didn't know we had gray.

MS. KOZAK: Gray is not applicable. Just to follow on with that White PI and White inspection finding, per the ROP the Region conducts the supplemental inspection associated with the issue, and that inspection was conducted in November 2003, and we did find that Exelon had done an appropriate root cause and taken corrective actions. So that finding is then closed, and there is no further follow-up inspection plan beyond the baseline inspection program.

That was all the remarks that I had today.

CHAIRMAN LEITCH: Thanks, Laura.

MR. KIM: All right, I am on Slide Number 25, and we are moving into Section 3 of the application, which is aging management review and

aging management programs.

Again, as I mentioned earlier, Dresden and Quad Cities' application follow the format of GALL report, and as such, the Section 3 is divided into six subsections for different group of systems. I'm not going to go through each one of these.

Let's go to Slide 26. This slide is a highlight of aging management programs. As it was mentioned earlier during the first presentation by Exelon, there are a total of 47 aging management programs that are credited for license renewal. Eighteen of those are considered common aging management programs, meaning it applies to multiple -- one or more systems, and 29 system or structure-specific aging management programs.

Eighteen of the 47 are considered consistent with GALL, and some of them with enhancements, and 20 aging management programs are considered consistent with certain exceptions. I think we talked about those before. Nine aging management programs are site specific in that they are all aging management programs.

As I mentioned earlier, through the staff's review process the applicant added four additional aging management programs, and in this area

the staff has one open item and five confirmatory items, all of which have been resolved at this point.

MR. BARTON: T.J., I have a question. In this section, talking about aging management of compressed air systems, there is discretion in the SER about the Dresden instrument air system that had some experience with corrosion and debris or whatever and in valves and valve operators, positioners, and then piping.

You talk about a program of periodically providing slowdown, which should say blowdown, I think. I never heard of a slowdown program. I'm not trying to be funny there. You talk about slowdown twice in that section, and it's confusing, but they talk about a blowdown, propose a blowdown program for instrument air piping. All right, and it says it has been initiated.

Now what are the results of this program, and what does the applicant propose to do if the program does not solve the problem. Thirdly, how is it that moisture has been introduced to where you've got corrosion, debris products in a system that is designed to provide clean, dry air?

MR. KIM: Okay. I'm going to ask Jim Strnisha to address that question.

MR. STRNISHA: Can you repeat that, please? I'm sorry.

MR. BARTON: Which part? All three parts?

MR. STRNISHA: Yes.

MR. BARTON: Okay. You talk in the SER, apparently Dresden has got a problem with some -- in the instrument air or some portion of the instrument air system. They got debris, corrosion products or whatever. So they propose to do a periodic blowdown program. I guess the debris, and you keep blowing it down.

My question is, you know, what is the results of this? Has this solved the problem, and if it hasn't, what has been proposed long term if that does not correct the problem, and thirdly, is there a design issue here or something with this system?

It's supposed to be instrument air. Instrument air system has dryers, etcetera, that's supposed to provide clean, dry air for instrumentation of valves and valve operator's positioner so the stuff works. Apparently, there's a problem here.

So I'm asking you, you know, what are they doing? Is it successful? What are they going to do if it's not successful, and what's the initiator of this problem? It's not supposed to be like this in

the instrument air system. That's my question.

MR. STRNISHA: Okay. I don't think I can answer that one. T.J., I didn't review the auxiliary systems. I reviewed one-time inspections, and I don't remember looking over that issue.

MR. KIM: Okay. Can anyone from the tech staff address that question?

MR. KUO: Well, T.J., let's move on. We'll get back.

MR. KIM: Yes, we'll get back to you on that question.

DR. FORD: I have a question about the water chemistry program. I think this is the right time to ask the question.

As I understand it, on page 312, the Revision 2 of the EPRI BWR water chemistry guidelines, has been approved by the staff. That's correct?

MR. KIM: Right.

DR. FORD: That was based on the fact that Peach Bottom used it in their application.

MR. KIM: Right.

DR. FORD: Now I notice that the applicant here have not used some of the less demanding aspects that were in Rev. 1, especially when you are using noble chem and hydrogen water chemistry, and that's

good that they are not using it, quite honestly; because some of the relaxation on the chloride and sulfate monitoring and ECP monitoring, I think, is maybe too relaxing, if you like.

MR. KIM: You're talking about from Rev. 1 to Rev. 2?

DR. FORD: That is correct. has anyone on the staff ever looked at the risk associated with, for instance, measuring ECP under hydrogen water chemistry and noble chem conditions? Has anyone asked the question what if, for instance, they don't keep hydrogen on all the time?

MR. KIM: I am going to ask the tech staff to address this specific question, but generally speaking, I know the staff has compared what is required under EPRI chemistry guideline Rev. 1 versus Rev. 2, item by item, and we have addressed all the relaxations. That is my big picture understanding of what the staff reviewed.

DR. FORD: My reservation does not apply to this particular applicant, because in fact they don't take advantage of those relaxations.

MR. KIM: Right. But your specific question about relaxing the requirements --

DR. FORD: Yes. Has anyone on the staff -

- that they are willing to accept the Rev. 2 applications. Yes. Has anyone done the risk analysis associated with having those relaxations apply for any station in the future?

You have created a precedent. So when the next station comes in that can use the Rev. 2 Water Chemistry Guidelines, and they may not be as responsible, if you like, as this current applicant.

MR. KIM: We will have to follow up on that. Barry?

MR. ELLIOTT: Let me just say this, that the EPRI Water Chemistry Guidelines are continuously updated based upon experience. I forgot -- When we originally put out GALL -- I don't know what Rev. they were up to, but I'm sure they are well past that Rev. now. And we review the differences between the two, between what we originally approved and what the new guidance is.

We don't look at any risk in that. We just look at what those differences are, and then we make a judgment about whether or not they are acceptable, the revision to the EPRI guidelines are acceptable for license renewal. That is our approach, and mostly it is based upon experience that the plants are operating, and they go out and they look and see

that certain changes are necessary to maintain water chemistry, for hydrogen water chemistry, for instance, or noble metal chemistry, some kind of adjustments in the guidelines.

So that's how we do this, our reviews, and I think that is explained in our SER.

DR. FORD; I think we will come back to this, because Dresden 2 --

MR. BOHLKE: Would you mind if I just correct something? You may have inadvertently given the impression that we don't have reliable a hydrogen chemistry system, and we do. That's an important attribute to us.

DR. FORD: I'm just going back to the early history of hydrogen water chemistry, which is applied at Dresden where you did not have hydrogen monitoring, and you were above the 2-230. I'm just referring to that historical time, which is undoubtedly the reason why you do measure ECPs now. My guess. Anyway, I'll come back to that.

MR. KIM: I would just like to add, that is probably one of those areas where the GALL update will probably capture the difference between EPRI Guideline version Rev. 2 versus Rev. 3.

DR. FORD: I keep asking this question.

When is GALL going to be upgraded?

MR. KIM: I think it is scheduled for Fiscal Year -- end of Fiscal Year '05 is when.

All right. I am on Slide Number 27. As I mentioned earlier, the NRR staff augmented by contractors -- we have performed a two-day audit of the aging management programs at the Exelon's engineering facility at Cantera.

The purpose of the audit was to really compare their aging management program basis documents against the corresponding GALL aging management programs, one by one, element by element -- keep in mind there are 10 elements to each program in GALL -- to make sure they are consistent, as the applicant has stated in their application.

Based on the audit, we have concluded that, for the most part, the applicant's aging management programs are consistent with GALL. We did find three exceptions, and the exceptions included in aging management programs for selected leaching, fire protection program, and one-time inspection program.

We will go into that in detail a little bit later.

Let's move on to Slide Number 28. Section 3.1 of the application addresses aging management

review and aging management programs for reactor vessel, internals and RCS. There were five confirmatory items in that section, four of which are resolved, and one still being reviewed by the technical staff as we speak.

Section 3.2 addresses engineer safety features systems, and there are no open or confirmatory items.

CHAIRMAN LEITCH: Concerning the reactor vessel, there is a relief that has been granted for circumferential welds. Evidently, the theory is that axial welds would fail much more likely than circumferential welds.

So basically, we are saying let's just look at the axial welds. But then Dresden -- I think it's Dresden -- you can't look at all the axial welds. I mean, I think the relief from circumferential welds was based on the fact that you were going to do 100 percent inspection of the axial welds, and infer from that, if they were okay, then the circumferential welds would be okay. But at Dresden you can't look at 100 percent of the circumferential welds.

MR. KIM: You mean the axial welds.

CHAIRMAN LEITCH: The axial welds, excuse me. So I was wondering, you know, what is the basis

for that being okay?

MR. ELLIOT: Barry Elliot again. You are asking about the basis for why we allow --

CHAIRMAN LEITCH: Less than 100 percent.

MR. ELLIOT: Less than 100 percent. The criteria is 90 percent. It's in the rule.

CHAIRMAN LEITCH: I think this is less than 90 percent.

MR. ELLIOT: This is probably less than 90. We look at the overall -- have to look at -- Every ten years the application -- This is a Part 50 question, really. What we do is every ten years licensees put in requests for relief from inspection, and that would be -- Whatever interval they are in now, they would have asked relief from inspecting the axial welds, and most likely the reason they can is because you can't get access to all of the axial welds.

CHAIRMAN LEITCH: Schedule restrictions, yes.

MR. ELLIOT: The jet pumps are in the way, and a whole bunch of other things are on the inside that you just can't get there. So this is a best effort, and the BWR owners group is developing tooling to make -- to better -- to get more access to these

welds. At the moment at lot of these welds, there just isn't access to them, and that's our basic philosophy -- not philosophy, but that's one of the reasons we give relief.

The second one is that we haven't -- These welds are not so unique. I mean, they are all -- I forgot who made these plants, but it was made by only a couple of vendors that make all the reactor vessels, and the -- In fact, I think B&W did these vessels.

So the vessels are -- Even though they are BWRs, the vessel weld materials are in PWRs, too, and so that we have a pretty good feel that there aren't flaws being made of any significant amount during fabrication.

The question is during operation, are there any flaws that could be operational occurring? We just haven't seen any of those. So we've been very flexible in giving relief to the problem of that they just don't have access.

CHAIRMAN LEITCH: Now does that also apply to Quad Cities or can they look at greater than 90 percent at Quad?

MR. ELLIOT: I don't have the relief request here, but I'm sure -- We have this general problem with BWRs, because of the access problem. We

don't have the similar problem with PWRs. They have more access, and so PWRs have this problem. I don't know specifically how much percentage Quad Cities and Dresden gets. We could look that up if you want and all that, but I'm just telling you this is the way we handle it.

We handle it as a Part 50 question, every ten years, based on the access, based upon the tooling capability, and the BWR owners group knows that this is a problem, and people are developing tooling to get in behind the jet pumps into different areas that we didn't have in the past. Hopefully, we will be getting as the plants age better tooling to get more -- a higher percentage of the welds looked at.

CHAIRMAN LEITCH: Okay, thanks, Barry.

MR. KIM: Okay. The next slide is on Section 3.3 and 3.4 which addresses auxiliary systems and steam and power conversion systems.

There is one open item and two confirmatory items in these two areas. If we move on to the next slide, the one open item -- The open item deals with the one-time inspection. Let me just briefly talk about what the nature of the open item is.

The one-time inspection -- The GALL

recommends one-time inspection is to be credited or performed to either verify effectiveness of other aging management programs, water chemistry program, for example, or to verify your assumption that aging is not occurring in a given component or system.

In its application, Exelon takes credit for a lot of -- a one-time inspection for a lot of systems and components, and the staff has, through RAI process, challenged that.

As a result, Exelon has developed or changed their position, if you will, on two of the one-time inspections to make those into a periodic inspection, and one example of that is a plant heating system where Exelon has now changed one-time inspection to a periodic inspection.

The staff has also challenged Exelon on various different combinations of environment and aging effects where they take credit for one-time inspection. As a result of that, they have expanded the scope quite significantly for one-time inspection.

By the way, this open item on one-time inspection has been resolved by the staff. We are in the process of revising our SER to reflect that.

Moving on to Slide Number 32. This slide addresses Section 3.5 of the application, which is

structures, containment and other structures. There is one open item in this area.

Basically, the open item comes down to the applicant -- The question was whether the applicant should take credit for structures monitoring program to inspect the MC supports, metal containment supports.

Where GALL recommends following the code requirements IWF, Exelon has taken an exception -- a partial exception to that. Exelon has suggested that they are going to follow IWF requirements for all of the MC components except the pipes that penetrate the containment, which they consider as part of the MC components. So that area is still being looked at by our technical staff.

DR. ROSEN: What is the substance of it? I understand they are taking exception, but why?

MR. KIM: Why?

DR. ROSEN: Why are they taking exception to the GALL here? I don't understand. This is the kind of thing that sort of puzzled me when I looked at this application, this and the one on upper shelf energy. Why are these things even showing up here? I don't understand the substance of this exception.

MR. MA: My name is John Ma. I am from

Division of Engineering.

This issue is because the current licensing basis for those they call processing piping, which are the piping penetrate through containment. They classify them as MC piping, and therefore, those supports attached to those piping they call MC piping supports.

Now this plant is pre-ASME plant. Therefore, at the time frame they classified them as MC piping supports there was no ASME code. So their current licensing position is MC piping and MC piping supports. Therefore, they have not done any inspection on those, but they said they did try to use a structural monitoring program to inspect those supports.

So they are trying to carry that program into licensing renewal period. That's the reason.

DR. ROSEN: Okay. So it is a pre-ASME Section 11 program that Exelon is comfortable with and familiar with, and just wants to -- and they are asserting is adequate to assure the integrity of these supports, and they want to carry that on into license renewal period. Okay.

MR. KIM: Where the staff is right now is that we are comparing their structures monitoring

program to IWF requirements and trying to compare the substance to see how comparable --

DR. ROSEN: Well, what happens if you do that, which you said you will, and you find something in IWF that you think is valuable? Does that then become something that you negotiate with Exelon?

MR. KIM: That's right. I'll give you an example. Sample size is an issue that we continue to dialogue with Exelon.

DR. ROSEN; Okay. So if it hadn't been for license renewal, they would never have to change this, because their license right now allows them to do it the way they are doing it.

MR. KIM: That's right. That's correct.

DR. ROSEN: Because they are not an ASME Section 11 plant.

MR. KIM: That's correct.

DR. ROSEN: But because it's license renewal, you get another chance to get up to the plate, and they've got to pitch again.

MR. KIM: If you want to put it that way, yes.

DR. SIEBER: So you are changing their current licensing basis?

MR. KIM: No.

DR. SIEBER: It's not a bad fit?

MR. KIM: It's not, because -- We believe it's not, because we are going beyond the current licensing term now. We are looking at beyond the first four years.

DR. ROSEN: Has the applicant claimed it's consistent with GALL?

MR. KIM: I'm sorry?

DR. ROSEN: Has the applicant claimed it's consistent with GALL with respect to this?

MR. KIM: I believe they said it's consistent with GALL with the exception of the process piping that they are characterizing as --

DR. ROSEN: And so it's not consistent with GALL. It's excepted, different.

MR. KIM: Right.

DR. ROSEN: For these things.

MR. KIM: Right.

MR. KUO: See, for license renewal review, we don't necessarily take the current existing program as it is. That's the whole basis of a license renewal. The license renewal rule says we carry the current licensing basis into the renewal period, with the exception of aging management.

So our review is to review whether the

aging effects is properly managed by this program. If we don't think this current program is sufficient, in our view, to manage the aging effect, then we will have to talk with them about it.

DR. ROSEN: So you'll report on this at the next meeting?

MR. KIM: Yes, sir, we will.

Okay, our next slide provides a quick overview of groundwater -- below grade water chemistry parameters, and as you can tell, both Dresden and Quad Cities are in a very mild, nonaggressive environment.

Moving on to Slide Number 35, Section 3.6 addresses electrical and -- aging management review and aging management programs for electrical and I and C components. As I said before, the applicant used a spaces approach to group the components into three commodity groups.

There are four aging management programs associated with these commodity groups, and the staff has reviewed them and have no open or confirmatory items in this area.

In summary for the aging management review and aging management programs, other than the open item that we just talked about, the staff has found that their aging management programs are consistent

with GALL. In cases where there were exceptions, staff has reviewed each individual exception specifically, and have found them acceptable.

We have concluded that their aging management programs are acceptable.

CHAIRMAN LEITCH: I just had one question about the accuracy of the SER. It's not really an aging management issue, but page 2-80 refers to the Quad Cities RHR system, and it talks about LPCI/LOOP selection logic.

I was just wondering, has the LPCI/LOOP selection logic been removed at Quad Cities? It was removed at most plants. I don't know about Quad Cities.

MR. KIM: I'm not even sure why something like that would be in the license renewal SER.

CHAIRMAN LEITCH: Page 2-80.

MR. KIM: Graham, the answer is it's not removed.

CHAIRMAN LEITCH: It's not removed? Okay, then my only concern was just the accuracy of the document. So it is accurate then. LPCI/LOOP selection logic is still in place. Fine.

So at the interest of totally blowing the schedule, I know we look forward with great

anticipation to Section 4 on the TLAAs and Kimberley's presentation. I would propose a quick ten-minute break, so we'll come back nice and fresh for that exciting presentation, actually nine minutes, ten to five.

(Whereupon, the foregoing matter went off the record at 4:35 p.m. and went back on the record at 4:46 p.m.)

CHAIRMAN LEITCH: Kimberley is going to take us through Section 4, the time limiting aging analysis. Right, Kim?

MS. CORP: That's right. Section 4 is the time limited aging analysis. Dresden and Quad Cities addressed all of the six generic TLAAs that were specified in GALL, as well as some plant specific TLAAs.

Section 4.2 dealt with the reactor vessel, internals, neutron embrittlement. There were seven analyses affected by irradiation embrittlement: The reactor vessel upper shelf energy, pressure-temperature limits, as well as five other neutron embrittlement related TLAAs.

For this section, we had one open item, currently under staff review which I will talk about in the next slide, and four confirmatory items that

have been resolved by the staff.

For the reactor vessel upper shelf energy calculations, the staff calculated for Dresden for the limiting beltline plate material for both units was about 50 foot-pounds, as well as for Quad Cities Units 1 and 2.

For the limiting weld, the screening criteria used by the staff was greater than or equal to 35 foot-pounds from the EPRI topical report which demonstrates that welds with upper shelf energy values of 35 foot-pounds can have margins of safety against fracture equivalent to those required by Appendix G, Section XI of the ASME Code. Therefore, they are acceptable.

So Dresden Units 2 and 3 were both above 35. Now Quad Cities Unit 2 is projected at 34 foot-pounds, and this is currently the one open item.

DR. WALLIS: This is at the end of the license or something?

MS. CORP: Right, the end of the projected licensing period.

DR. ROSEN: What is different about that weld?

MS. CORP: John Honcharik of the staff -- this was his topic.

DR. WALLIS: It almost looks as though the staff made a mistake.

MR. HONCHARIK: My name is John Honcharik. I guess the reason why it is 34 is based on one of their surveillance data, and that surveillance data made it extremely low. So when they did the calculations to that topical report, it was below the screen criteria of 35 foot-pounds.

DR. ROSEN: It's one capsule.

MR. HONCHARIK: Yes.

DR. ROSEN: Somebody said that earlier.

MR. HONCHARIK: Right.

DR. ROSEN: What was it about that capsule that -- Is there any theory there? What am I supposed to believe, that capsule or something else?

MR. HONCHARIK: Well, I think there were a total of three. This was the electroslag weld for Quad 2. I think there were three capsules. This one was the lowest one. So in order to take a conservative approach, we asked them to do an plant specific equivalent margin.

DR. ROSEN: Well, let's talk about the capsule. You got three capsules, and you take the lowest one. Do you do that all the time?

MR. HONCHARIK: Yes.

DR. ROSEN: So like, for instance, the Unit 2 at Dresden, there's three capsules there. You take the lowest one, and you calculate your limiting weld.

MR. HONCHARIK: Right.

DR. ROSEN: Upper shelf energy, and you get 49 foot-pounds. Right? And that's the same process you use for all of them. But when you do that for Quad Unit 2, you get 34, but the other two -- what would you get if you did the same calculation with either or both of the other two?

MR. HONCHARIK: I believe the other two would have been higher than 35 foot-pounds.

DR. ROSEN: I should hope so. What would you get? Would you get 49? Would you get something comparable to the numbers that you see at the other Quad unit and Unit 2 and 3 at Dresden?

MR. HONCHARIK: No. It was higher than the 35. It was, I guess, more comparable to the other units.

DR. ROSEN: Well, this is one of the crucial issues. Is the reactor vessel really fit for service for 60 years? So what I'd like to see is the data for all of them, all the capsules, and the calculation for each of them separately. Is that

something you can do, assuming you've done it.

MR. HONCHARIK: Yes. You're talking about the margin analysis?

DR. SHACK: No, I think he just wants the Charpy data for the other specimens.

MR. HONCHARIK: Okay. I believe that should be in the application, too.

DR. ROSEN: Okay, if you could show that.

MR. HONCHARIK: All right.

DR. WALLIS: That's the other question: What do they show? This is the staff calculated value? What did the applicant submit?

MR. KIM: Mr. Kluge from Exelon?

MR. KLUGE: Yes. This is Mark Kluge from Exelon. To go back to the previous question, if you looked at the other three capsules, there are actually four that have been analyzed from Quad Cities, and used only the results of those capsules, you would get a final end of life upper shelf energy of about 46 foot-pounds.

So the one capsule that is limiting is an outlier as far as not only Quad Cities Unit 2 and not only the Exelon plants. It is an outlier for electroslag weld data throughout the BWR fleet that has such welds.

DR. ROSEN: Any theory why you got what you got there?

MR. KLUGE: Well, as I'm sure you know, when you do an upper shelf energy with the Charpy testing, if you have a limited number of data points, one data point that could be bad for whatever reason -- if that specimen had a flaw in it that wasn't detected -- that can skew the data badly.

The only theory we can presume here is that we have such a data point. The upper shelf for this particular capsule was determined with just two data points.

DR. FORD: So what would the resolution of this problem be then?

MR. KLUGE: Well, the resolution that we presented to the staff, and the previous slide, I believe, said we were still preparing the analysis -- It has not been submitted. The resolution is that we took that limiting data and took 34 foot-pounds that you would calculate with the limiting results, and then did an equivalent margin analysis showing that, for the transients either specific to Quad Cities or bounding Quad Cities and the material in the Quad Cities vessel, that 34 foot-pounds would give you an adequate result. That is, a flaw would not propagate

throughwall, if you had a limiting transient.

DR. ROSEN: And that's acceptable?

MR. KLUGE: Yes.

DR. ROSEN: That's what you do when you don't meet the screening criteria, which is what those are.

MR. KLUGE: Yes. The screening criteria from the VIP were meant to give all the BWRs this cookbook method to show that you were adequate quickly. It just turns out, when you use that specific Quad Cities capsule, we didn't pass.

DR. ROSEN: So you did the equivalent margins analysis, and you are fine.

MR. KLUGE: That's correct.

DR. ROSEN: Well, and probably what you need to do is to -- Well, the staff can decide. You will have to come back to this.

MR. KUO: We will have to come back on this.

DR. ROSEN: And tell us that you have accepted the equivalent margins analysis in the case of Quad 2.

MR. KUO: That's right, and we might even present the data to you.

DR. SIEBER: I presume the specimen after

the Charpy test has been disposed of.

MR. KLUGE: That specific test was done in 1981. So --

DR. SIEBER: That's right. It has been disposed of.

MR. KLUGE: If it hasn't been disposed of, I'm sure it is not readily retrieved.

DR. SIEBER: Okay, because you could look for a flaw.

DR. ROSEN: That's not necessary. All I'm saying is --

DR. SIEBER: Well, it's not. It's easier to do it the other way.

DR. ROSEN: Well, they've done what is required. It's just the staff has to report it and make a specific finding with respect to it.

MR. KIM: That's correct, and we will follow up on that.

MR. HONCHARIK; Right, and I'd like to make a point, that the data for Quad 2 was gathered through RAIs that we had with the applicant. That was not part of the original submittal. It was based on RAI responses.

MR. KUO: John, that's okay. We will get back to Dr. Rosen.

DR. ROSEN: Well, not just me. I mean, the whole Committee.

MR. KUO: Yes, the whole committee. Yes.

DR. ROSEN: This is something that you will have to talk about when you come back.

MR. KUO: Since you asked the question, I just mentioned your name.

MS. CORP: Okay. For pressure/temperature curves, Section 4.2.5 of the LRA states that the P-T curves will be available prior to the period of extended operation and that the updated limits must be in the P-T limit report or in the technical specifications prior to the period of extended operation.

This is being tracked by Commitment Number 47 in Appendix A of the SER.

CHAIRMAN LEITCH: The SER -- This may not be exactly the right place to bring this up, but the SER on page 2-48 has a discussion of Dresden Number 2 jet pump riser braces. It sounds like, of the four, these are an outlier and may have to be replaced, and I guess this situation is going to be evaluated prior to entering the period of extended operation?

MR. KIM: That is correct.

CHAIRMAN LEITCH: But it seems as though

this is a vibration issue perhaps rather than an aging issue. I'm not sure whether this is flow dependent or time dependent. I'm just wondering whether the consideration here should be looked at based on the extended power uprate versus looked at prior to entering the period of extended operation.

MR. POLASKI: Graham, the designs of the jet pump riser brace on Unit 2 are unique, and they are not replicated for Unit 3 or Quad Cities Units 1 and 2. In fact, in the last Dresden 2 outage, we went in and put one repair clamp, I believe, to the one brace that was actually cracked, and we put mitigating clamps on the rest of the braces for that jet pump scheme with 20 jet pumps to preclude any adverse effects from vibration at any flows that we expected to see.

So we think we have taken this guy out of play, substantially taken out of play with a backfit.

CHAIRMAN LEITCH: So you preemptively put these clamps on all the jet pumps?

MR. POLASKI: We fixed the one that was broken, and we put mitigating clamps on the ones that weren't so that they wouldn't be in the frequency range of interest.

CHAIRMAN LEITCH: Okay, thank you.

DR. ROSEN: Can you explain, Kimberley, this confirmatory item on reactor vessel axial weld failure probability? I have read that thing three times, and I still don't get it.

MS. CORP: The actual commitment in the table?

DR. ROSEN: What is the issue here? It brings in Clinton and the axial welds from Clinton as a comparison. I'm totally confused by that.

MS. CORP: I think Barry Elliot will address that.

MR. ELLIOT: The axial welds -- This came out of the circumferential weld evaluation. When we originally did -- When G.E. did the original circumferential weld proposal to eliminate the circumferential welds, they compared the probability of vessel failure for the circumferential welds to the axial welds, and the circumferential welds were very low probability of failure. So we could eliminate their inspection.

When they did the evaluation, they also looked at the axial welds, and they had a high probability of failure in the original analysis -- very high, much higher than we would have liked.

So we asked them to go back and sharpen

their pencils and do a revised analysis, so that they could show that the axial welds would have a low probability of failure.

What they did, they looked at the fleet, and they determined which was the limiting axial welds in the entire fleet, and I think it was Clinton and some other plant. I forgot which one it was, but it's in the SER.

They only did the evaluation. So what they determined was, for a certain route of embrittlement, certain adjusted reference temperature, that as long as the embrittlement stayed below that adjusted reference temperature, the axial welds would have a low probability of failure.

So what we've said in the SER was all plant shave to demonstrate that their embrittlements are below that criteria, so that we are assured that the axial welds have a low probability of failure. So everybody has to go look at their fluents, their copper, and based upon uprate, based upon license renewal, and determine that their adjusted reference temperatures are below the value in our SER, which is based upon the limiting plants at the time we did the evaluation.

DR. ROSEN: That's very helpful. Now stay

with me here, Barry. The Clinton welds, Clinton axial welds, the NDT value is 91 degrees C. It's fairly high.

MR. ELLIOT: What's that?

DR. ROSEN: Ninety-one at Clinton.

MR. ELLIOT: Yes, that's fairly high.

DR. ROSEN: Yes. So if you are lower than that, you are okay?

MR. ELLIOT: That's right.

DR. ROSEN: So what this says is Dresden and Quad Cities have RTNDT values of 19 degrees C, which is way below 91. So that looks like it is going to be okay.

MR. ELLIOT: Yes.

DR. ROSEN: Then the confirmatory item is the applicant should confirm that Quad Cities 1 and 2 have a mean value of 19 degrees C for RTNDT and address this TLAA of the axial welds for Quad Cities in the USFAR Supplement.

So what is it you are asking for here?

MR. ELLIOT: What happened was -- This was our discussion about whether they had to do this for both Dresden and Quad Cities. They only wanted to do it, I think, for Dresden. They didn't want to do it for Quad Cities, and we said you have to do it for

both units, both plants.

So they have to do it, and they have to do the same evaluation they did -- I guess they did it for Dresden there. They got to do the same thing for Quad Cities, and they got to confirm it. I mean, that's what I get out of that write-up. I don't remember, but that sounds like what it was.

DR. ROSEN: Okay. So that's what is open. That confirmatory item remains open, I gather. Is that right?

MR. ELLIOT: That's a confirmatory item, because we pretty much know that they are going to be okay, but they are the ones that are supposed to do this evaluation, not us.

MR. HONCHARIK: Right. This is John Honcharik. They have submitted a response to that confirmatory item.

DR. ROSEN: They have already?

MR. HONCHARIK: Yes.

DR. ROSEN: So they've done it?

MR. HONCHARIK: Yes, and we found that it acceptable.

DR. ROSEN: Okay. It's just not reported here.

MR. HONCHARIK: Right.

MR. KIM: Keep in mind, though, this was back in February.

MR. HONCHARIK: This is the draft.

MR. KIM: This was done in February.

DR. ROSEN: Okay.

MR. HONCHARIK: And they submitted in March.

DR. ROSEN: Thank you. That's all very helpful.

MS. CORP: All right. The next section 4.3 dealt with metal fatigue. The reactor coolant system components at Dresden and Quad Cities are designed to Class 1 of the ASME Code. Design criteria for fatigue analysis of ASME Class 1 requires the cumulative usage factor to be less than 1, and all components have projected cumulative usage factors of less than 1 for the period of extended operation.

The staff had no open or confirmatory items for this section of the SER.

Section 4.4 was the environmental qualification. The applicant has adequately identified the TLAA for EQ components, and the applicant's EQ program was also consistent with GALL. The staff concluded that the EQ program will continue to manage equipment in accordance with 10 CFR 50.49

and 10 CFR 54.21 (c)(1), Parts i, ii and iii.

There were no open or confirmatory items for this section as well.

Section 4.5 was the pre-stress in concrete containment tendons. None of the Dresden or Quad Cities containments have prestressed tendons. As such, this topic was not applicable to this application, but it was a generic TLAA in GALL.

Section 4.6, fatigue of primary containment, attached piping, and components: The staff concludes that the TLAAs for this section remain valid or the effects of aging on the intended functions will be adequately managed for the extended period of operation.

This includes suppression chamber vents and downcomers, as well as the SRV discharge piping, external suppression chamber, and such. Again, there were no open or confirmatory items for this section.

Section 4.7 were other plant specific TLAAs that were plant specific to Dresden and Quad Cities. As you can see, they are listed there. I won't go through them all. But the staff evaluated them, and all demonstrated that the TLAA has been projected to the end of the period of extended operation, and there were no open or confirmatory

items for these plant specific TLAAs.

DR. FORD: Earlier in the discussion, Kimberley, we talked about the clamp that is used to mitigate the cracking of the core shroud, and someone said that the examination of that had been put into a TLAA. Where here is that?

MS. CORP: Well, I think it was Section 4.7.2.2. Was that the drywell plates?

DR. FORD; No, no. This is the core shroud.

MR. KIM; It's actually addressed -- It's part of the first bullet on Slide Number 37. It is included in the TLAA for reactor vessel and internals neutron embrittlement.

MR. HONCHARIK: Yes. I think you are talking about the reflood shock analysis for the core shroud?

DR. FORD: Yes.

MR. HONCHARIK: 4.2.24, page 4-13.

MR. KIM: Of the staff's SER.

DR. FORD: Remind me. What period is that bolt made of, that 12-foot bolt or whatever it is, the bold material construction -- the clamp?

MR. KIM: The clamp.

MR. HONCHARIK: I think it is stainless

steel. Is that correct?

MR. POLASKI: Yes.

DR. ROSEN: It's a 12-foot bolt. It goes from the top to the bottom of the core shroud and clamps onto the top and bottom to hold it together, and you believe that you've got enough good J1-C data for the bolt thread for stainless steel at those fluence limits, end of life fluence limits?

If I remember rightly, the J1-C values for those fluences is extremely scattered. What criteria are you using as to how long you can continue to use this clamp bolt?

MR. HONCHARIK: Well, I haven't reviewed that part. So I'm not sure if I could answer that question.

DR. FORD: This comes back to my original concern. I always thought that this clamping device was a quick fix where you came up with mitigating actions if you have a long term whether it be weld repair or whatever it was going to be, or replacement of the core shroud.

So I was surprised when I learned that this now an approved long term remedy. And if it is an approved long term remedy, you better have some way of monitoring its degradation. That's why I asked the

question.

MR. KIM: Dr. Ford, we have to go back and check.

MR. KUO: Dr. Ford, I think this is a topic of the BWR VIP, but I don't know exactly the number. We will come back to you.

DR. FORD: The other question, a subsidiary question is that let's assume that this bolt is relaxing by radiation induced creep. How much cracking is there on the core shroud, the current core shroud that we're trying to mitigate, and is it being monitored?

DR. WALLIS: What about the tension in the bolt?

DR. FORD: Well, that's what I'm saying. You could relax fairly quickly. So then forget any mitigation from that bolt. So then what risk have we with the current cracks?

MR. POLASKI: This is Fred Polaski at Exelon. I can't answer your specific question, but I can tell you that BWR VIP is now considering those clamps to be permanent fixes, and there are BWR VIP inspections that are performed of them.

I can't answer the detailed questions about what they inspect for and all the analysis, but

that is -- Essentially, it is a long term permanent fix at this point.

DR. FORD: Because it becomes somewhat critical. We talked about the belt and suspenders approach of using nobel chem and a clamp, but if now you are saying, hey, we don't know how much relaxations occurred in the bolt or whether the bolt is cracking itself because of the stress concentration in the bolt, and we get it PWRs. Why can't we get it in a BWR?

So that's gone. So what sort of mitigation do we have against those effects, and will it last another 20 years or whatever the time period is?

MR. KIM: That's what TLAA was supposed to address. Will it last for another 20 years? But we'll have to get back to you on your specific questions.

MS. CORP: All right. That concludes the TLAA analysis. The applicant has identified the appropriate TLAAs and has demonstrated or is committed to demonstrate that the TLAAs will either remain valid for the period of extended operation, have been projected to the end of the period of extended operation, or the aging effects will be adequately

managed for the period of extended operation.

With that, T.J. will conclude our presentation.

MR. KIM: As a summary of the staff's presentation, as I have alluded to earlier, from the schedule standpoint we just received the applicant's final response addressing all the open items and confirmatory items and, as we mentioned earlier, we are in the process of going through those.

We are looking at issuing the final SER toward the end of July. July 26th, I believe is the scheduled date for issuing final SER. About a month from that point in time, we will be coming back to you in a format of full Committee to address the status of the open items and some of the items that came up during the Subcommittee meeting.

DR. ROSEN: T.J., what is this last bullet, 2.758? I'm not sure -- I know I don't know what that is. Chapter 2?

MS. CORP: Oh, that was if there was any intervention or --

DR. ROSEN: It's the Rules of Practice. Right?

MS. CORP: Right. If there were any contentions, and there were none raised for Dresden

and Quad Cities.

DR. WALLIS: Now Number 2, the first thing, I'm just thinking about a member of the public reading that. What they would like to read would be there is reasonable assurance that no material failures will occur or something like that. That's what they would like to read. This is sort of vague thing about activities will continue to be conducted in accordance -- That's a very general, vague sort of term, isn't it?

MR. KIM: Those words were crafted by our lawyers.

DR. WALLIS: I know.

MR. KUO: If I may, these words are for the overall conclusion. All the details of the materials and aging effects and all that, hopefully, have been all addressed in the SER.

DR. ROSEN: What you really mean is you don't anticipate that there will be aging effects which will affect the safety of the plant during the next period of operation, whenever it is. That's what you are really saying, isn't it?

DR. ROSEN: That's what it means, but if you don't say it this way, you can't issue a license.

DR. WALLIS: But the impression given here

is that it all depends upon human beings, when they don't -- activities are conducted. I mean, people may do things differently in 10 years. It's a very strange way to put it, isn't it?

MR. KIM: It's right out of the Code.

DR. WALLIS: I know, but I'm just thinking, if you put this in a newspaper, is it going to reassure the public?

MR. KIM: We have to keep in mind, this is a licensing action.

DR. WALLIS: I know, I know, I know.

DR. SIEBER: I'm not sure what newspaper would print that.

MR. KIM: The Vermont Times. As I said before, we do owe you some answers to some of the questions that came up during the Subcommittee meeting, and again we really appreciate all the feedback that we received from the Subcommittee. I think it's been very valuable.

CHAIRMAN LEITCH: Okay, thank you.

I think at this point we should go around the room and ask the Committee if there are any additional items. I mean, I don't think we need to belabor the ones that we have already discussed, but are there any additional items, comments, you would

like to make, particularly things that you want to hear more about at the full Committee meeting?

So, Jack, do you want to start with that?

DR. SIEBER: Well, I'm satisfied with the staff's conclusions in their write-ups. So I have no additional requests to make.

CHAIRMAN LEITCH: William?

DR. SHACK: No, I can't think of anything.

CHAIRMAN LEITCH: Graham?

DR. WALLIS: No, I don't have any items. I do think that -- Well, it has to be this way. We spent a lot of time on sort of things which really don't have that much effect on the safety of the plant, and in order to keep reassuring the public, there ought to be something that reflects that the big issues have all been taken care of and we are just nibbling at the fringes somehow. It has to come through as a result of our deliberations, and I suppose it does in our letter.

CHAIRMAN LEITCH: I wasn't sure I understood you, Graham. You say you're not sure it comes through in our letters?

DR. WALLIS: Well, I hope it does come through in our letters, that the big issues have been all taken care of, and all this time we spent on these

-- you know, whether or not the bay in the building is in scope and all that -- I mean, this is so far away from the big issues that somehow -- The resolution of all the big issues have got to come across.

CHAIRMAN LEITCH: Typically, our letters--

DR. WALLIS: There aren't any big issues.

CHAIRMAN LEITCH: -- draw the conclusion that the renewal application should be renewed based on you, and a lot of times it has a statement similar to that one that you objected to. But those words come out of the Code of Federal Regulations, and I guess we have to --

DR. WALLIS: Well, there is a public out there saying these things are getting older and older, and we know all things eventually fall apart, and --

DR. SHACK: I thought we had a more positive statements, that the aging management program will manage degradation.

DR. WALLIS: That's right, we do, I think.

DR. SHACK: The one that says we'll just conduct activities really does seem a little --

DR. BONACA: And I think you better start with that comment, because I mean, that is really -- Typically, we bring out examples on the vessel, vessel head, etcetera, for BWRs, because that's really where

the issues are more significant.

I have a comment, by the way. If you look at the AMP problems here like B-11 through B-19 or 10 and all about the vessel internals and other piping systems and so on, all of them describe -- you know, 25 cracks here and cracks there, etcetera, etcetera, which is a typical experience of BWRs in the Nineties.

You know, I know that there has been a lot of improvement brought about by the BW VIP program, and it will be interesting, I think, maybe for the full Committee to give us a view of how you have dealt with some situations, and I think the situation has improved now. I mean, you have a lot of the cracking issues are under control.

It will be an interesting -- you know, even just a couple of moments to give a presentation on what you have seen. You have four BWRs here. You must have lived through a lot of these issues, and you discussed some of them. I think that would be interesting.

The other thing I would like to just say again is the issue we discussed this morning of GALL being so prescriptive. That is a separate issue from Dresden and Quad Cities, but you know, it wills be helpful if we can have some of this experience brought

into GALL in a way that -- take minor exceptions, you know, because again in this case I don't see that the exceptions taken like on the fire piping system were unreasonable. They were reasonable, but they were following the very strict prescription of GALL that says, you know, you shall inspect every two months, I mean literally. Well, you know, why two months? In some cases -- Well, anyway, that was the comment.

MR. KUO: This is really the goal of our next update, actually to update the GALL. What we are doing is that not only that we will incorporate all the ISGs that have been approved so far, but we are going to actually go into the past SERs, take out all the past positions that the staff has approved and that are not in GALL.

We will incorporate all that into GALL. Hopefully, by doing that, we could provide, say, a range of acceptance criteria. That way, actually, it would make the review for the staff much easier for the inspectors. They can do the job much better.

DR. BONACA: Sure, and you still have the leverage to state additional expectations, should there be a logic behind that. But in general, you will have many less exceptions taken.

MR. KUO: Yes, that's what we are doing.

CHAIRMAN LEITCH: Peter?

DR. FORD: I agree with Graham. There's nothing -- I haven't heard anything that says that there is a safety issue here, but there are, as I have said today, three material degradation problems which could be very embarrassing if they are not resolved.

The first one is the question of my concern about the applicability of the Rev. 2, the BWR water chemistry guidelines. It does not apply to Dresden and Quad Cities. They are using it, but I think, a generic thing, it is a potentially embarrassing situation.

The other one is the steam dryer and whether it should be in scope or not, and the veracity, if you like, of it being a non-safety related item.

The third one is the details of this core shroud clamp, which we don't seem to know anything at all about. If in fact it does fail, again it would be embarrassing.

Those are the three things that embarrass me.

MR. KUO: And we will get back to the Committee for all three issues.

DR. FORD: Thank you. That's it.

CHAIRMAN LEITCH: Thank you. John?

MR. BARTON: I don't have any major issues. I think this was a really well prepared application, and the SER was very responsive.

The two issues that we didn't have answers for -- and I'll give to Marvin to get to the staff. We may want to hear the answers to those at the full Committee meeting. That was the -- You know, for the sake of having the documents accurate, you know, the question on reactor building and closed cooling water system, and also the instrument air situation.

If the staff would come back to the full meeting and say how those things have been resolved, I think. You know, there were some significant open items which, according to what we heard today, are just about closed out. So if the ACRS at its full meeting is satisfied with the way the staff has closed those out, I don't have any other major issues.

CHAIRMAN LEITCH: You were satisfied with this seal leakage and --

MR. BARTON: Yes. I know what they are doing, and I think that's about the best that you can do if you are monitoring it.

CHAIRMAN LEITCH: Yes.

MR. BARTON: You know, other than going

and doing PTs and visuals on bellows and welds up in -- and that's probably not practical. So I think their program is satisfactory there.

DR. ROSEN: I just want to follow up on Graham's comment about -- Graham Wallis' comment about how exhausting this thing is and the level of detail we go into, and the applicant and the staff, it's true, have gone through a meticulous and extensive effort here. It's just important that they do that, painful as it is. And they did it well, and I think it's good.

The only issue I would -- trying to focus on the meat here, rather than making sure that the scope is covered meticulously, the meat here is, to me, this upper shelf energy question on Quad Unit 2.

It has a reasonable answer, but it is an answer that the full Committee needs to hear. I think, P.T., you have been typically providing a chart that shows the screening criteria, and this one will -- if you do that again, which, of course, you know I like -- will jump right out at the full Committee and will require this discussion to be full and complete.

MR. KUO: Okay, we will do it.

CHAIRMAN LEITCH: Marvin, did you have anything?

MR. SYKES: I have nothing else to add.

CHAIRMAN LEITCH: Okay. I really had nothing to add except to thank all the presenters, Exelon and the NRC staff, for their efforts and their presentation today. I think it has been very useful.

Unless anyone else has anything to add, we will adjourn one minute early.

(Whereupon, the foregoing matter went off the record at 5:25 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 Reactor Safeguards Plant License Renewal Subcommittee Quad City Nuclear Power Station

Docket Number: n/a

Location: Rockville, MD

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

Rebecca Silberman

Rebecca Silberman
Official Reporter
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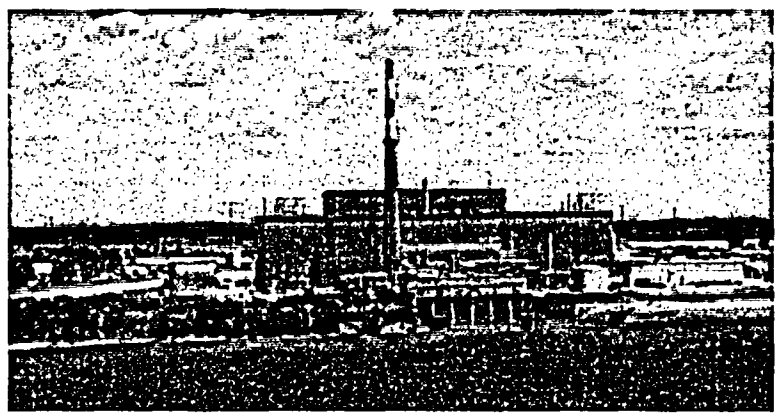
Nuclear

Dresden Nuclear Power Station
Quad Cities Nuclear Power Station

Presentation to
Advisory Committee on Reactor Safeguards
Subcommittee on License Renewal

Exelon Nuclear

April 14, 2004



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Nuclear

Agenda

- Background Information - Bohlke
- Operating Experience / Extended Power Uprate - Bohlke
- Major Equipment Replacements / Repairs - Polaski
- Unique Scoping Topics - Stachniak
- Major Exceptions to GALL - Stachniak
- Commitment Management / Tracking - Polaski

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Application Background

- January 2003 – Application submitted
- November 2003– draft Quad Cities Supplemental Environmental Impact Statement issued
- December 2003 - draft Dresden Supplemental Environmental Impact Statement issued
- February 2004 – draft Safety Evaluation Report issued

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Plant Description

- General Electric BWR-3 with Mark I containment
- Fresh water cooling
- Licensed power level 2957 MWth
- Current Dresden licenses expire in 2009, 2011
- Current Quad Cities licenses expire in 2012
- Extended Power Uprates completed in 2001, 2002

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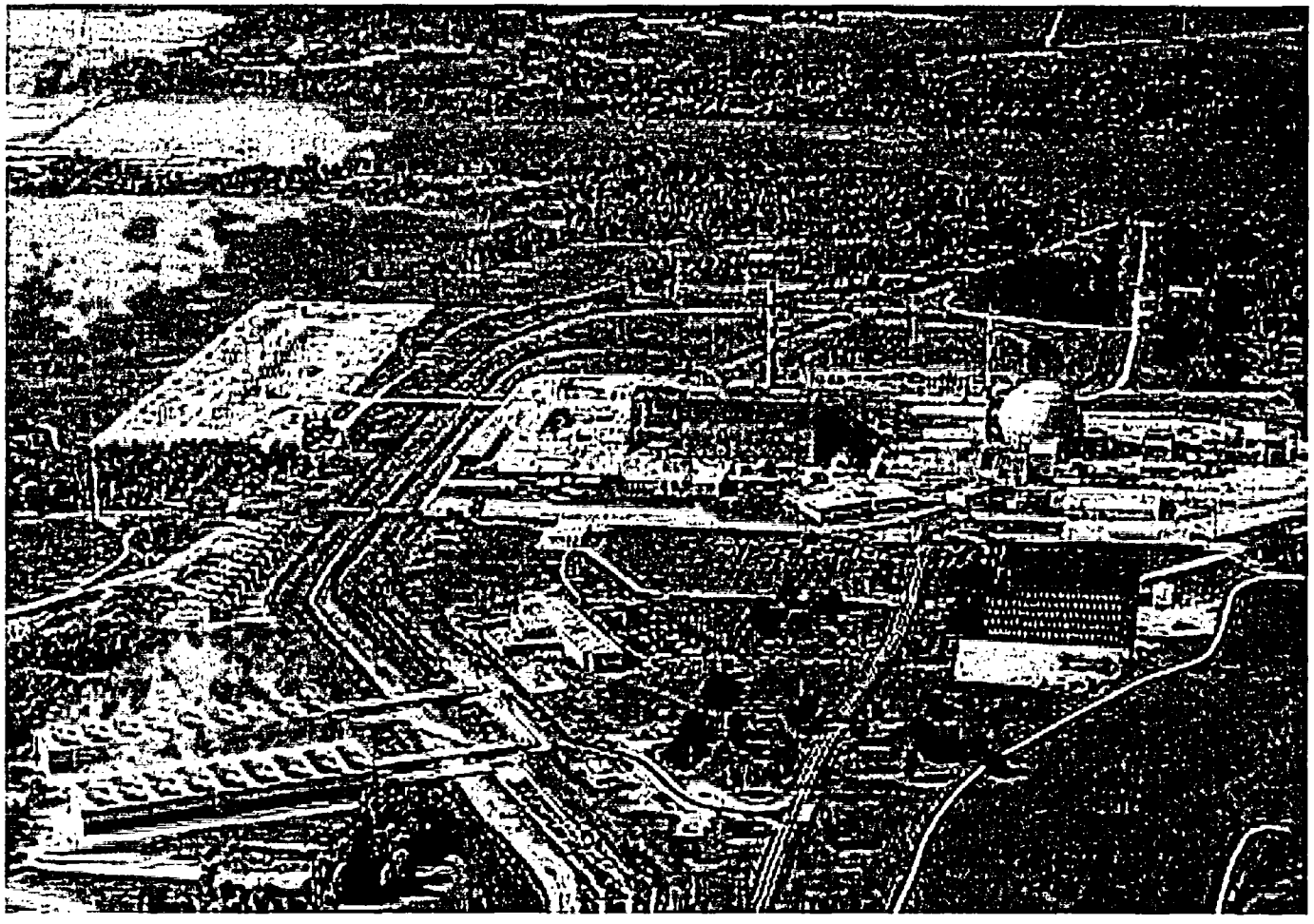
Dresden Nuclear Power Station



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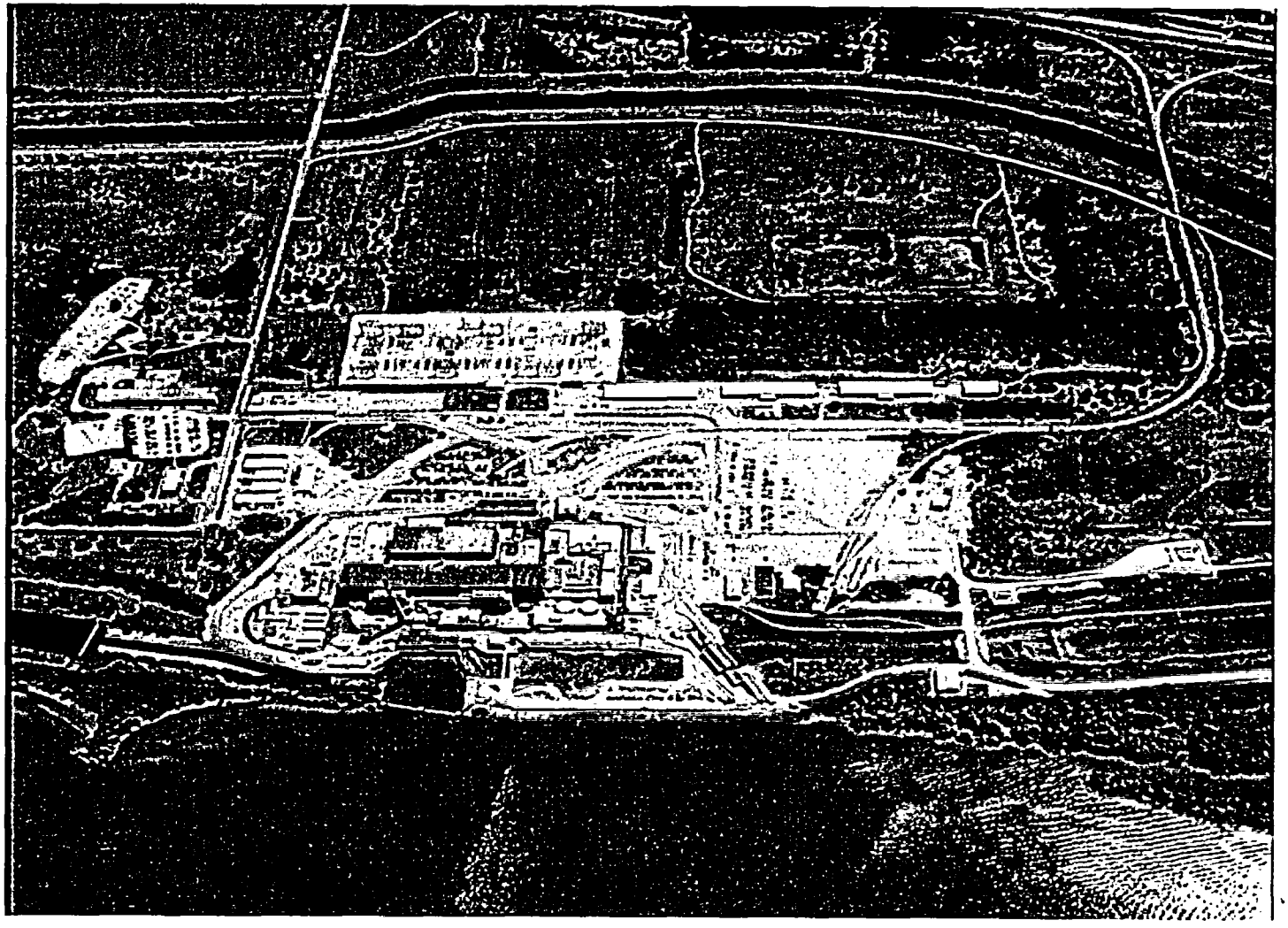
Quad Cities Nuclear Power Station



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Significant Plant Differences

	Dresden	Quad Cities
Core isolation cooling	Isolation Condenser System	Reactor Core Isolation Cooling (RCIC) System
Residual heat removal	Shutdown Cooling System Low Pressure Coolant Injection System	Residual Heat Removal (RHR) System
	Containment Cooling Service Water System	RHR Service Water System
Appendix R shutdown	High Pressure Cooling Injection (HPCI) System Isolation Condenser System	HPCI System RCIC System Safe Shutdown Make-up Pump
Circulating water	Cooling lake and supplemental cooling towers (limited open cycle cooling in summer months)	Open cycle cooling using Mississippi River

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Performance Indicators

- All Reactor Oversight Performance Indicators for both plants are Green except for Dresden Unit 3 HPCI unavailability, which is White

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Plant Performance – 5 years

Dresden	1999	2000	2001	2002	2003
Capacity Factor	88.7	94.7	90.1	92.9	90.3
Refueling Outages	2	1	1	1	1
Refueling Outage length - days	25.5	17	19	19	28
Radiation Exposure - Rem per unit	289	144	192	183	194
Quad Cities	1999	2000	2001	2002	2003
Capacity Factor	93.6	90.8	94.9	85.9	90.6
Refueling Outages	0	2	0	2	0
Refueling Outage length - days		20.5		21	
Radiation Exposure - Rem per unit	92	447	73	883	233

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Major Plant Modifications for EPU

- New high-pressure turbine rotors
- Condensate demineralizer system changes
  - prefilter system at Dresden
  - new demineralizer at Quad Cities
- Isolated phase bus duct cooling capacity increase
- Feedwater heater shell section replacements
- Steam dryer perforated plates (to reduce moisture carryover)
- Piping supports and related structural reinforcements
- Miscellaneous instrument/control setpoint changes
- Drywell structural steel reinforcements

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Dresden Extended Power Uprate

Unit	Implementation Date	Post EPU Capacity Factor
Dresden 2	December 2001	94.0%
Dresden 3	November 2002	91.6%

- EPU modifications increased licensed power by 17%
- Post EPU Operating Experience
  - High frequency vibration on main turbine control valve EHC pressure switch caused half scram during Unit 2 startup
  - One Unit 2 RFP suction relief valve weld failed due to vibration during startup
  - Feedwater sample probe failure
  - Structural improvements to dryers resulting from Quad Cities lessons learned installed on both units
  - Dresden 2 continuous run 690 days

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Quad Cities Extended Power Uprate

Unit	Implementation Date	Post EPU Capacity Factor
Quad Cities 2	March 2002	92.3%
Quad Cities 1	December 2002	89.5%

- EPU modifications increased licensed power by 17.8%
- Post EPU Operating Experience
  - Main steam low point drain line failed following Unit 2 startup March 2002
  - Unit 2 shutdown in July 2002 and June 2003 to repair degraded dryer
  - Unit 1 shutdown in November 2003 to repair degraded dryer
  - Vibration related damage discovered on 1 ERV during Nov 2003 outage
  - Unit 2 dryer damage discovered in March 2004 during refueling outage

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Major Equipment Replacements

- Reactor water cleanup system piping replacement
- RHR service water system piping replacement (Quad Cities only)
- Reactor recirculation piping replacement (Dresden Unit 3 only)
- Main power transformer replacement
- Underground fire header replacement (Dresden only)
- Core shroud repairs
- Hydrogen water chemistry, zinc injection, and noble metals injection applied

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Long Term Asset Management

- Exelon has a long term asset management plan in place
  - Updated yearly
  - Includes all Exelon Nuclear plants
  - Factors into long range budget planning
  - Complements our routine Preventive Maintenance and Performance Centered Maintenance
  - Provides basis for long term replacements

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Examples of Equipment Replacements/Refurbishments

- Main generator rewind
- Main condenser tube replacements
- Plant process computer upgrades
- LP turbine rotor replacements
- Large motor replacements
- I&C system upgrades to digital

Dresden Fire Protection Scoping

- The Dresden Unit 2/3 fire protection system includes portions of the Dresden Unit 1 fire protection system, which are in the scope of the Maintenance Rule program. These include:
  - Underground fire protection supply header
  - Diesel fire pump and screen wash pumps
  - Unit 1 Cribhouse Building (houses the fire pump)
- No other Unit 1 equipment is used to support Units 2 and 3

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Scoping of Non-Safety Related Piping

- Non-safety related pipe attached to safety related piping
  - Initial scoping included all attached non-safety related pipe and components up to the first support in each orthogonal direction
  - Scoping boundaries were later expanded to include pipe and components up to the first two supports in each orthogonal direction
- Spatial interaction of non-safety related piping
  - Initial scoping excluded non-safety related piping systems separated from safety equipment by more than 20 feet
  - The physical separation criterion has been abandoned. Exelon is currently assessing the impact that this methodology change will have on the original scoping results
  - Some previously excluded non-safety related systems have been brought into scope

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Exceptions to GALL

- 38 of 47 aging management programs are related to GALL
- 18 programs are consistent with GALL
- 20 programs are consistent with exceptions
- All exceptions contain alternative aging management activities acceptable to the NRC
- Examples of exceptions:
  - BWR Penetration Inspection
  - Fuel Oil Chemistry
  - Inspection of Overhead Heavy Load Handling Systems

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Below Grade Environment

Parameter	Aggressive limit	Dresden	Quad Cities
pH	< 5.5	7-9	6.9 – 7.9
Chlorides	> 500 ppm	5 – 30 ppm	≤ 29 ppm
Sulfates	> 1500 ppm	10 – 30 ppm	≤ 24 ppm

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NRC Review Status

- Draft SER status:
  - 5 open items – 1 resolved and 4 under review
  - 16 confirmatory items – 15 resolved and 1 under review
  - Closure documentation has been provided to the NRC
- Inspection and Audit status
  - All technical issues have been resolved
  - A follow-up NRC regional inspection scheduled in May will confirm the adequacy of the action tracking system for license renewal commitments

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Commitment Management

- License renewal commitments are documented in the Exelon commitment tracking system
- The commitment tracking system is controlled by the Exelon commitment management process described in LS-AA-110, "Commitment Management"
- Exelon commitment management process is consistent with NEI 99-04, Rev 1, "Guidelines for Managing NRC Commitment Changes", endorsed by the NRC
- Changes to a commitment require a formal review and evaluation
- Changes in commitments are provided to the NRC along with the Updated Final Safety Analysis Report revisions

License Renewal Commitments

- A unique commitment tracking number has been created for each Aging Management Program and a tracking file has been created for each procedure, work request, and periodic surveillance credited for license renewal
- Aging management programs are comprised of implementing procedures, work requests, and periodic surveillances that implement activities of a program
- Steps contained in procedures, work requests, and periodic surveillances that implement license renewal commitments are annotated as license renewal commitments and are tracked on a station specific basis

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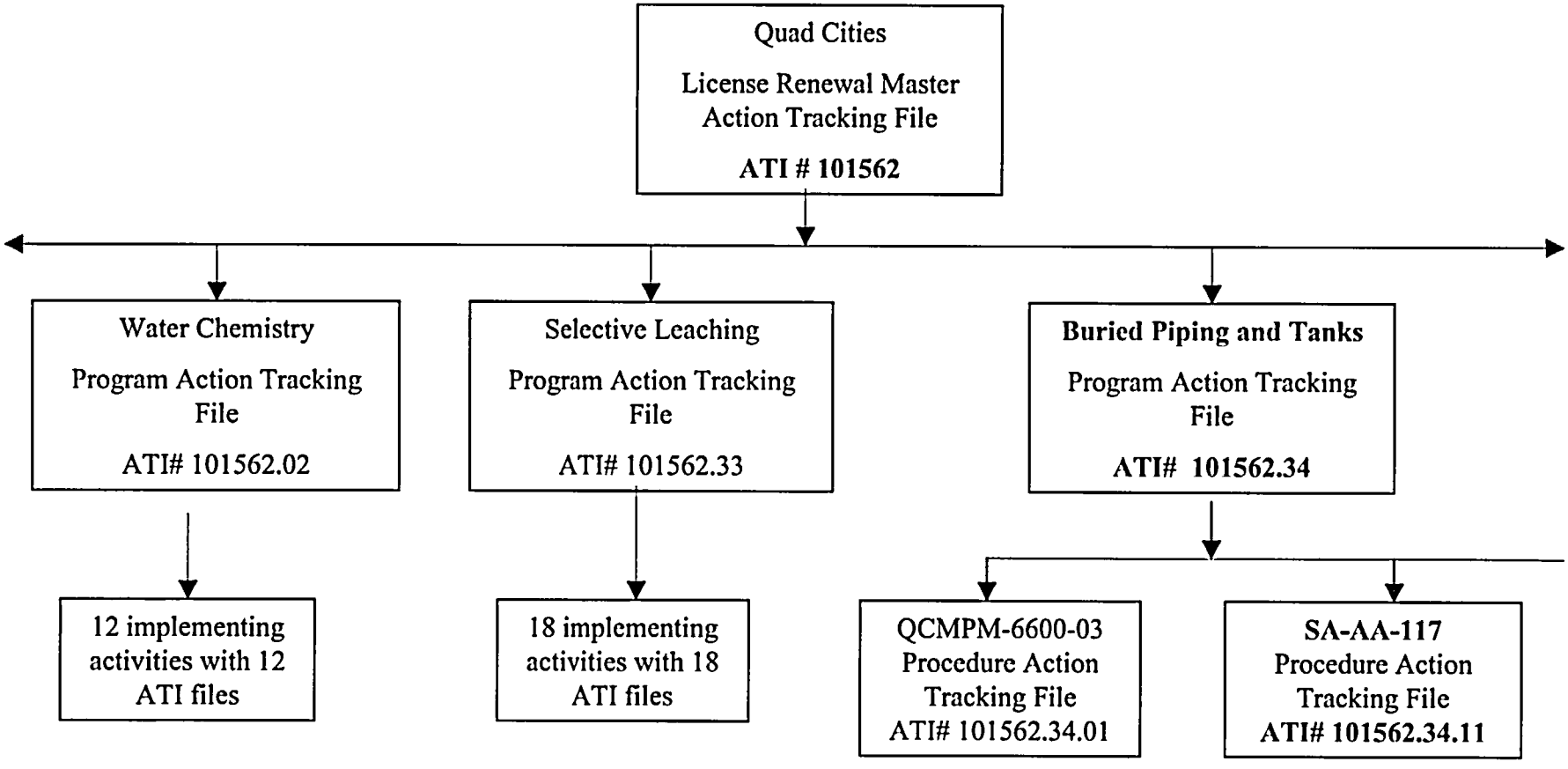
Commitment Tracking File Structure



Examples on following slides

Example - Procedure Annotation

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The following step was annotated as license renewal commitments in Exelon procedure, SA-AA-117, "Excavation, Trenching, and Shoring"

4.7 Exposing Underground Piping, Structural Steel or Concrete During Excavation **(CM-2, CM-3, CM-4, CM-5, CM-6)**

4.7.1 If underground piping, structural steel or concrete is exposed during excavation, Then PERFORM the following:

1. NOTIFY Engineering to inspect piping, structural steel or concrete for evidence of coating degradation or corrosion, concrete cracking or spalling, signs of corrosion in steel.

2. Engineering INSPECT piping or structural steel for evidence of coating degradation (if coated pipe or steel components) or corrosion (if uncoated metal pipe or steel components). Engineering INSPECT concrete components for cracking or spalling. RECORD results of inspections in ACTION TRACKING and record the Action Tracking Number In the Comments Section of the Excavation Permit.

References:

6.1.	Commitments
6.1.1	Limerick
	(CM-1) A/R# A0789662, (LGS) LER 1-93-011 (T02973
6.1.2	Peach Bottom
	(CM-2) PBAPS License Renewal Outdoor, Buried, and Submerged Component Inspection Activities (T04329) (Step 4.7)
6.1.3	Dresden
	(CM-3) Action Tracking Item AR 00101522.34.15, License Renewal Aging Management – NUREG – 1801 "Generic Aging Lessons (GALL) Report, Section XI.M34 Buried Piping and Tanks Inspections. (Step 4.7)
	(CM-6) Action Tracking Item AR 00101522.40.12, License Renewal Aging Management – NUREG – 1801 "Generic Aging Lessons (GALL) Report, Section XI.S6 Structures Monitoring Program. (Step 4.7)
6.1.4	Quad Cities
	(CM-4) Action Tracking Item AR 00101562.34.11, License Renewal Aging Management – NUREG – 1801 "Generic Aging Lessons (GALL) Report, Section XI.M34 Buried Piping and Tanks Inspections. (Step 4.7)

Procedure Action Tracking File

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ATI # 101562.34.11 – Quad Cities

The following commitment(s) was/were made in the application for the renewed Operating License per 10 CFR 54 and will need to be carried forward into future revisions or subsequent procedures superceding **SA-AA-117, "Excavation, Trenching, and Shoring."**

Note:

The commitment cannot be changed without prior approval from the appropriate individual(s) associated with aging management (License Renewal) compliance. Any deletions or changes to this commitment shall be made in accordance with LS-AA-110, Commitment Management.

Commitment:

Periodic inspections of buried piping and tanks to manage the effects of corrosion are performed when the opportunity arises. Inspections are performed utilizing procedures **SA-AA-117, Excavation, Trenching, and Shoring**, and ER-MW-450, Structures Monitoring, whenever said components are excavated during station yard area maintenance or general yard excavations to detect coating or base metal degradation

Basis for Commitment:

This procedure is credited in AMR M08, Appendix IV XI.M34 (Elements 3, 4, 5, 6, 7).

References:

Letter to Nuclear Regulatory Commission from Jefferey A. Benjamin, Quad Cities Nuclear Power Station, Units 1 and 2, Dresden Nuclear Power Station, Units 2 and 3, Application for Renewed Operating Licenses, dated January 3, 2003. License Renewal Application (LRA), Appendix A, Section A.1.25 and Appendix B, Section B.1.25

Parent Action Tracking Number **101562.34**

Program Action Tracking File

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Action Tracking Number
101562.34 – Quad Cities

B.1.25 Buried Piping and Tanks Inspection

Introduction

Appendix A and B of the Dresden/Quad Cities License Renewal Application (D/QC LRA) identify all activities that are credited for aging management of passive, long-lived components and structures within the scope of license renewal. Specifically, section A.1.25 of Appendix A and section B.1.25 of Appendix B describe aging management activities credited for components exposed to soil and/or groundwater. This action tracking file documents those activities credited as part of the Buried Piping and Tanks Inspection aging management program (AMP) that has been credited for the aging management of component external surfaces exposed to a soil and groundwater environment.

The aging mechanisms and aging effects associated with those component external surfaces falling within the scope of license renewal exposed to a soil and groundwater environment is contained in Aging Management Report (AMR), M08, External Environments. This AMR along with the license renewal application can be found in the electronic data management system (EDMS) for reference.

ATI # 101562.34

aging management activities credited for components exposed to soil and/or groundwater.

The scope of components included in the Buried Piping and Tanks Inspection AMP activities include buried ferrous portions of the diesel fuel oil systems and storage tanks, fire protection system piping, circulating water (ultimate heat sink) system piping, condensate/CCST system piping, and demineralized water system piping. It also includes buried mechanical joint rubber gaskets contained in the fire protection piping. The ferrous components are constructed from the materials included in the following aging mechanism listing, and are subject to a "Loss of Material" aging effect. Rubber mechanical joint materials are subject to a "Change in Material Properties" aging effect.

Material	Aging Mechanism
Carbon steel	General corrosion, pitting corrosion, crevice corrosion and MIC
Cast iron	General corrosion, pitting corrosion, crevice corrosion, MIC and selective leaching (B.1.24, Selective Leaching of Materials, is utilized in conjunction with B.1.25 to address selective leaching)
Ductile iron	General corrosion, pitting corrosion, crevice corrosion and MIC
Stainless steel	Pitting corrosion, crevice corrosion and MIC
Rubber	Elastomer degradation and loss of resiliency

buried ferrous portions of the diesel fuel oil systems and storage tanks, fire protection system piping, circulating water (ultimate heat sink) system piping, condensate/CCST system piping, and demineralized water system piping. It also includes buried mechanical joint rubber gaskets contained in the fire protection piping.

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At Quad Cities, yard excavation activities to date have not uncovered buried piping or tanks due to their locations and depths of the specific routings. Since inspections during periodic uncovering of buried components cannot solely be relied upon for providing effective degradation aging management, other inspection and testing activity license renewal commitments have been credited.

The Buried Piping and Tanks Inspection AMP activities provide for managing the **"Loss of Material"** (for both ferrous and asbestos concrete) and the **"Change in Material Properties"** aging effects through the use of piping and component coatings and wrappings, periodic inspections, and pressure testing.

Commitments

Exelon has committed to implement a Buried Piping and Tanks Inspection AMP that is consistent with the program described in Section XI.M34 of NUREG 1801, Generic Aging Lessons Learned Report, dated April 2001 with the following one exception:

NUREG-1801 indicates that buried piping and tanks are inspected when they are excavated during maintenance. NUREG-1801 also indicates that because the inspection frequency is plant-specific and also depends on plant operating experience, the inspection frequency requires further evaluation.

managing the "Loss of Material" (for both ferrous and asbestos concrete) and the **"Change in Material Properties"** aging effects through the use of piping and component **coatings and wrappings**, **periodic inspections**, and **pressure testing**.

Inspections of Quad Cities buried components uncovered due to maintenance cannot be relied upon as the sole method for providing effective aging management because uncovering of piping or tanks during maintenance is not likely. Therefore, the Quad Cities AMP as enhanced includes the use of piping and component coatings and wrappings, periodic pressure testing, buried tank leakage checks, inspections of buried tank internal surfaces, and inspections of the ground above buried tanks and piping. It also includes a one-time internal UT inspection of one buried steel tank, and a one-time visual inspection of the external surface of a buried piping section.

The following Buried Piping and Tanks Inspection AMP activities, sorted by coatings and wrappings, periodic inspections, and pressure testing, comprise the commitments for this AMP:

Coatings and Wrappings

Coatings and wrappings on buried ferrous piping and tanks perform a mitigative function by preventing metal contact with the aggressive soil/groundwater. All buried carbon steel piping at Quad Cities was in the past, and will continue to be, coated prior to installation or after maintenance. This determination is based upon two facts: 1) The original and current installation specifications applicable for Quad Cities buried piping (R-2329 and R-4411, Section1501.10) require an external coating on buried carbon steel piping, and 2) There has been no failure history at Quad Cities of buried carbon steel piping attributed to the absence of an external coating on the piping.

Coatings and Wrappings

Program Action Tracking File

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Periodic Inspections

•Periodic inspections of buried piping and tanks to manage the effects of corrosion are performed when the opportunity arises. Inspections are performed utilizing procedures SA-AA-117, Excavation, Trenching, and Shoring, and ER-MW-450, Structures Monitoring, whenever said components are excavated during station yard area maintenance or general yard excavations to detect coating or base metal degradation (AT Nos. 101562.34.11, 101562.34.13).

•Periodic inspections of the inside of buried tanks will be performed. Quad Cities procedure QCMPM 6600-03, Diesel Oil storage Tank Cleaning, and predefines 15839-02, 23085-03 direct the cleaning and visual inspection of the inside surfaces of the fuel oil storage tanks. These visual inspections will also detect thru-wall degradation penetrating from the exterior surfaces of the tanks (AT Nos. 101562.34.01, 101562.34.08, 101562.34.10).

•A one-time UT inspection of the internals of one buried fuel oil storage tank to detect loss of material will be performed utilizing work order 592920. In addition to verifying the effectiveness of the current fuel oil chemistry control program, it will also identify wall thinning caused by a loss of material originating from the exterior surfaces of the tank (AT No. 101562.34.06).

→ **Periodic Inspections**

Inspections of the ground above buried commodities are performed, utilizing procedure ER-MW-450, Structures Monitoring, for indications of below-ground seepage or ground settling (AT No. 101562.34.13).

A one-time inspection of a section of buried ductile iron fire protection piping, including a mechanical joint, will be performed, if determined to be necessary (see NOTE below). The inspection will examine the piping surface for coating and base metal degradation, and the mechanical joint for evidence of minor leakage or other indications of a lack of joint integrity (AT Nos. 101562.34.05, 101562.34.14).

NOTE

This inspection is only required if excavation inspections as specified in AT Nos. 101562.34.11, 101562.34.13 above do not occur prior to 12/14/10 (Two years prior to the expiration of both Quad Cities Units 1 & 2 current term licenses).

Pressure Testing

Periodic pressure testing of buried cooling water piping is accomplished utilizing ISI pressure testing of Class 3 buried cooling water piping, performed in accordance with ER-AA-330-001, Section XI Pressure Testing. The rate of pressure loss or change-in-flow between the ends of the buried components is utilized as the VT-2 visual examination for the buried piping and components (AT No. 101562.34.12).

→ **Pressure Testing**

Presentation Summary

ACRS License Renewal Subcommittee

Dresden and Quad Cities Nuclear Power Station License Renewal Application

Safety Evaluation Report with Open Items
April 14, 2004

TJ Kim
Senior Project Manager

Kimberley Corp
Project Manager

Overview

- Exelon submitted its application for Dresden and Quad Cities by letter dated January 3, 2003
- General Electric BWR/type 3 reactor, Mark I containment
  - generates 2957 megawatt thermal at both Dresden and Quad Cities
  - generates 850 and 855 megawatt electrical at Dresden and Quad Cities, respectively
- Location of Stations
  - Dresden is on the Illinois and Kankakee Rivers in Grundy County, Illinois.
  - Quad Cities is on the Mississippi River 3 miles north of Cordova, Rock Island County, Illinois.

Overview continued

- Current licenses expire
  - Dresden Unit 2 – December 22, 2009
  - Dresden Unit 3 – January 12, 2011
  - Quad Cities Units 1 & 2– December 14, 2012
- Request license renewal through
  - December 22, 2029 for Dresden Unit 2
  - January 12, 2031 for Dresden Unit 3
  - December 14, 2032 for Quad Cities Units 1 & 2
- Application implemented the generic aging lessons learned (GALL) process

NRC Review Process

- 5 Open Items (1 resolved, 3 under review, 1 waiting applicant response)
- 16 Confirmatory Items (15 resolved, 1 under review)
- Brought into scope and subjected to AMR
  - Several new systems and components
- 4 new AMPs

NRC Audits and Inspections

- Scoping and Screening Methodology Audit
  - May 19-23, 2003
- Scoping and Screening Inspection
  - July 28 – August 1, 2003 (Exelon Headquarters)
- Aging Management Program Audit
  - October 7-8, 2003
- Aging Management Review Inspection
  - September 29 – October 3, 2003 (Dresden)
  - October 14-17, 2003 (Quad Cities)
- Optional Third Inspection
  - March 15-17, 2004

Section 2 – Structures & Components Subject to an AMR

2.1 – Scoping and Screening Methodology

- Describes methodology used to identify SSCs that are within the scope of the license renewal rule and subject to an AMR
- Staff audit determined that the applicant's methodology satisfies the rule
- 2 Open Items (1 waiting applicant response, 1 under staff review)

Open Item

- OI – 2.1-1
  - The staff identified that there was not sufficient basis for limiting consideration of fluid spray interactions to only those non-safety related SSCs located within 20 ft of an active safety related SSCs.
  - Resolution – The applicant has decided not to take the 20 ft exception and has scoped in all systems and components. Applicant is still evaluating the systems and components to be scoped in with new methodology.

Open Item

- OI-50-237/03-04-01, 50-249/03-04-01, 50-254/03-04-01, and 50-266/03-04-01
  - The staff identified the need for clarification of the definition of an equivalent anchor as used to determine the extent of non-safety related attached to safety related systems that was included within the scope of license renewal.
  - Resolution – Currently under review by NRR and RIII staff.

Section 2 – Structures & Components Subject to an AMR continued

Section 2.2 – Plant Level Scoping Results

- Staff reviewed Section 2.2 to determine if any systems, structures or commodities required to be within scope were omitted.
- No Open or Confirmatory Items

Section 2 – Structures & Components Subject to an AMR continued

Section 2.3 – Scoping and Screening of Mechanical Systems

- Includes the following systems:
  - Reactor Vessel, Internals, and Reactor Coolant System
  - Engineered Safety Features Systems
  - Auxiliary Systems
  - Steam and Power Conversion Systems
- No Open or Confirmatory Items

Steam Dryers/EPU

- Steam dryers are generally not in scope for license renewal according to the rule.
- Staff has determined that Quad Cities and Dresden are unique among other operating BWRs.

Section 2 – Structures & Components Subject to an AMR continued

Section 2.4 – Structures and Structural Components

- Describes structures and structural components
  - Containment
  - Other Structures (15)
- No Open or Confirmatory Items

Section 2 – Structures & Components Subject to an AMR continued

Section 2.5 – Electrical and Instrumentation and Controls

- These components were evaluated on a plant-wide basis utilizing the "spaces" approach
  - 3 commodity groups
- No Open or Confirmatory Items

Scoping and Screening Summary

- Scoping and screening methodology is adequately described and justified in the LRA and satisfies the requirements of 10 CFR 54.21(a)(2).
- Scoping and screening review results found that the SSCs within the scope of license renewal have been identified, as required by 10 CFR 54.4(a) and those subject to an AMR have been identified, as required by 10 CFR 54.21(a)(1).

License Renewal Inspections

Highlights:

- Scoping and Screening Inspection
- Aging Management Review Inspection
- Plant ROP

License Renewal Inspection Program Implementation

- License Renewal Manual Chapter–MC2516
- License Renewal Inspection Procedure–IP71002
- Site-specific inspection plan for each applicant
- Scheduled to support NRR's review
- Resources – regional inspection personnel

License Renewal Inspections

Scoping and Screening Inspection

- Objective: to confirm that the applicant has included all appropriate SSCs in the scope of license renewal as required by the rule
- One week in length
- Conducted July 28 – August 1, 2003 at Exelon Headquarters

License Renewal Inspections continued

Scoping and Screening Inspection Results

- Scoping and screening process was successful in identifying those SSCs needing aging management review

License Renewal Inspections continued

Aging Management Review Inspection

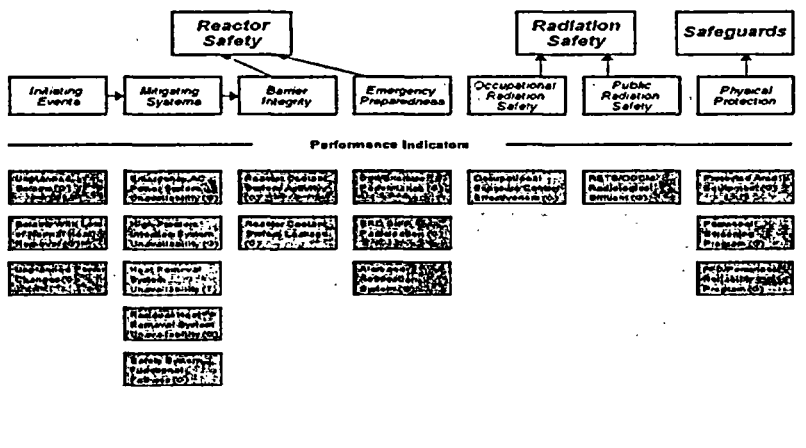
- Objective: to confirm that existing AMPs are managing current age related degradation
- Two weeks in length
- Conducted September 29 – October 3, 2003 at Dresden and October 14-17, 2003 at Quad Cities

License Renewal Inspections continued

AMR Inspection Results

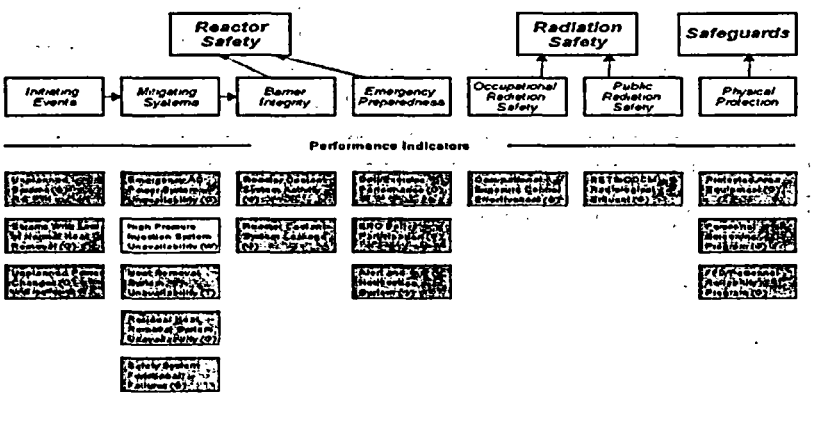
- Material condition of plant was being adequately maintained. No significant aging related issues were identified.
- Documentation was of good quality, detailed, and understandable.
- Third Optional Inspection conducted March 15-17, 2004. An additional follow-up inspection will be conducted in May/June 2004

Dresden 2
4Q/2003 Performance Summary



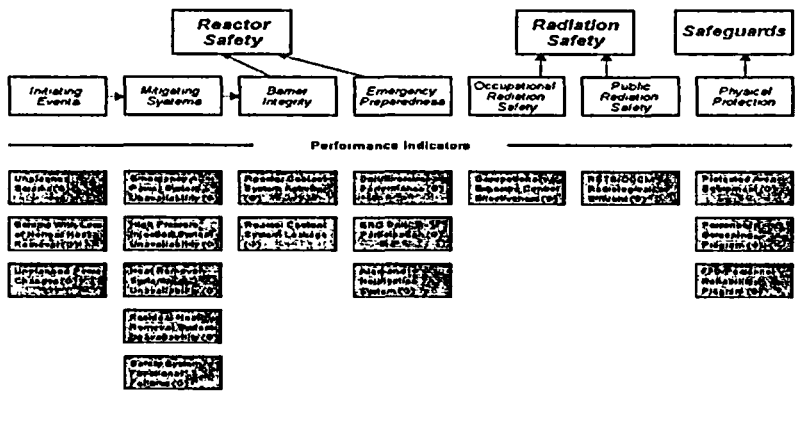
Last Modified: January 23, 2004

Dresden 3
4Q/2003 Performance Summary



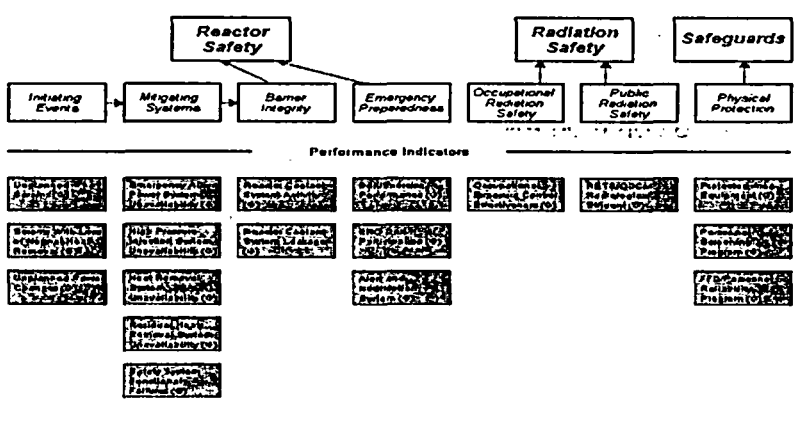
Last Modified: January 23, 2004

Quad Cities 1
4Q/2003 Performance Summary



Last Modified January 23, 2004

Quad Cities 2
4Q/2003 Performance Summary



Last Modified January 23, 2004

Section 3 – Aging Management Review

GALL divides systems and structures into 6 broad system/structural groups

- Reactor Vessel, Internals, and Reactor Coolant System (Section 3.1)
- Engineered Safety Features Systems (Sections 3.2)
- Auxiliary Systems (Section 3.3)
- Steam and Power Conversion Systems (Section 3.4)
- Containments, Structures and Component Supports (Section 3.5)
- Electrical and Instrumentation and Controls (Section 3.6)

Aging Management Programs

Aging Management Programs

- 47 AMPs credited for license renewal
  - 18 common AMPs
  - 29 system/structural group-specific AMPs
    - 18 AMPs consistent with GALL/consistent with enhancements
    - 20 AMPS consistent with GALL, with exceptions
    - 9 AMPS non GALL
- 4 new AMPs added – 3 system specific and 1 common
- 1 Open Item and 5 Confirmatory Items (all resolved)

AMP Audit

- Date of audit – October 7-8, 2003
- Auditors - 4 Project managers from license renewal, 1 Regional inspector and 5 Contractors
- Concluded AMPS were consistent with GALL except:
  - Three AMPs were revised by making enhancements to the programs for review by the technical staff. The staff found them acceptable.

Section 3 – Aging Management Review continued

Section 3.1 – Reactor Vessel, Internals and Reactor Coolant Systems

- 5 Confirmatory Items (4 resolved and 1 under review)

Section 3.2 – Engineered Safety Features System

- No Open or Confirmatory Items

Section 3 – Aging Management Review continued

Section 3.3 & 3.4 – Auxiliary Systems & Power Conversion Systems

- 1 Open (AMP Open Item) and 2 Confirmatory Items (all items resolved)

Open Items

One-Time Inspection – Auxiliary System: Plant Heating System

- OI-B.1.23-2
  - The staff identified that additional information needs to be provided on the environmental conditions and the operating experience in order to justify the use of a one-time inspection, or provide periodic inspections for these components
  - Resolution – Staff has received applicable information and is incorporating into the final SER.

Open Items continued

One-Time Inspection – Steam and Power Conversion: Main Steam

- OI-B.1.23-2 continued
  - The staff identified that additional information needs to be provided to justify the use of a one-time inspection.
  - Resolution – Staff has received applicable information and is incorporating into the final SER.

Section 3 – Aging Management Review continued

Section 3.5 – Containment, Structures, and Component Supports

- Containment structure
- 15 other structures
- 1 Open Item (under review)

Open Item

ASME Section XI, Subsection IWF

- OI-3.5.2.3.2-1
  - The staff identified that the existing IWF program is not consistent with GALL in that it does not include the inspection of Class MC supports
  - Resolution – Currently under review by NRR staff

Aging Management of In-Scope Inaccessible Concrete

	Aggressive Limit	Dresden	Quad Cities
pH	< 5.5	7-9	6.9 - 7.9
Chlorides	> 500 ppm	5 - 30 ppm	< 29 ppm
Sulfates	> 1500 ppm	10 - 30 ppm	< 24 ppm

- Periodic testing to verify chemistry remains non-aggressive
- Below grade soil/water environment non-aggressive

Section 3 – Aging Management Review continued

Section 3.6 – Electrical and Instrumentation and Controls

- 3 Component commodity groups subject to AMR
  - electrical cables and connections
  - bus ducts
  - high voltage transmission conductors and insulators
- No Open or Confirmatory Items

Aging Management Review Summary

- Aging management review found that the applicant has demonstrated that the effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the current licensing basis for the period of extended operation, as required by 10 CFR 54.21(a)(3)

Section 4 – Time-Limited Aging Analyses

- Reactor Vessel and Internals Neutron Embrittlement
- Metal Fatigue
- Environmental Qualification
- Loss of Prestress in Concrete Containment Tendons
- Fatigue of Primary Containment, Attached Piping and Components
- Other Plant-Specific TLAAS

Section 4 – TLAAs continued

Section 4.2 – Reactor Vessel and Internals Neutron Embrittlement

- Seven analysis affected by irradiation embrittlement identified as TLAAs
  - Reactor Vessel USE
  - Pressure-Temperature Limits
  - 5 other neutron embrittlement related TLAAs
- 1 Open Item (under staff review)
  4 Confirmatory Items (resolved)

Reactor Vessel Upper Shelf Energy (USE)

Reactor Vessel Beltline Material	Screening Criteria USE (FT-LBS)	Staff Calculated USE (FT-LBS) Dresden		Staff Calculated USE (FT-LBS) Quad Cities	
		Unit 2	Unit 3	Unit 1	Unit 2
Limiting Beltline Plate Material	≥ 50	75	77	76	80
Limiting Weld	≥ 35 (EMA)*	49	47	49	34**

- * EPRI Topical Report – 113596 demonstrated that welds with Charpy USE values of 35 ft-lbs can have margins of safety against fracture equivalent to those required by Appendix G, Section XI of the ASME Code; therefore acceptable.
- ** Open Item – Plant specific equivalent margin analysis (EMA) is being prepared by the applicant for a weld with a Charpy USE less than 35 ft-lbs.

Pressure/Temperature Curves

- The applicant will submit P-T curves for the period of extended operation for approval before the current license expires
- Technical specifications will be updated as required by Appendix G of 10 CFR 50

Section 4 – TLAAs continued

Section 4.3 – Metal Fatigue

- Reactor coolant system components at Dresden and Quad Cities designed to Class 1 of the ASME Code
- All components have projected cumulative usage factor (CUF) < 1.0 for the period of extended operation
- No Open or Confirmatory Items

Section 4 – TLAAs continued

Section 4.4 – Environmental Qualification

- Applicant has adequately identified the TLAA for EQ components
- Applicant's EQ Program is consistent with GALL
- Staff concluded EQ Program will continue to manage equipment in accordance with 10 CFR 50.49, and meets 10 CFR 54.21(c)(1)(i), (ii), and (iii)
- No Open or Confirmatory Items

Section 4 – TLAAs continued

Section 4.6 – Fatigue of Primary Containment, Attached Piping, and Components

- The staff concludes that the TLAAs for this section remain valid or the effects of aging on the intended functions will be adequately managed for the extended period of operation.
- No Open or Confirmatory Items

Section 4 – TLAAs continued

Section 4.7 – Other Plant-Specific TLAAs

- Reactor Building Crane Load Cycles
- Metal Corrosion
- Crack Growth Calculation of a Postulated Flaw in the Heat Affected Zone of an Arc Strike in the Suppression Chamber Shell
- Radiation Degradation of Drywell Shell Expansion Gap Polyurethane Foam
- High-Energy Line Break Postulation Based on Fatigue Cumulative Usage Factor

- All demonstrate that the TLAA has been projected to the end of the period of extended operation
- No Open or Confirmatory Items

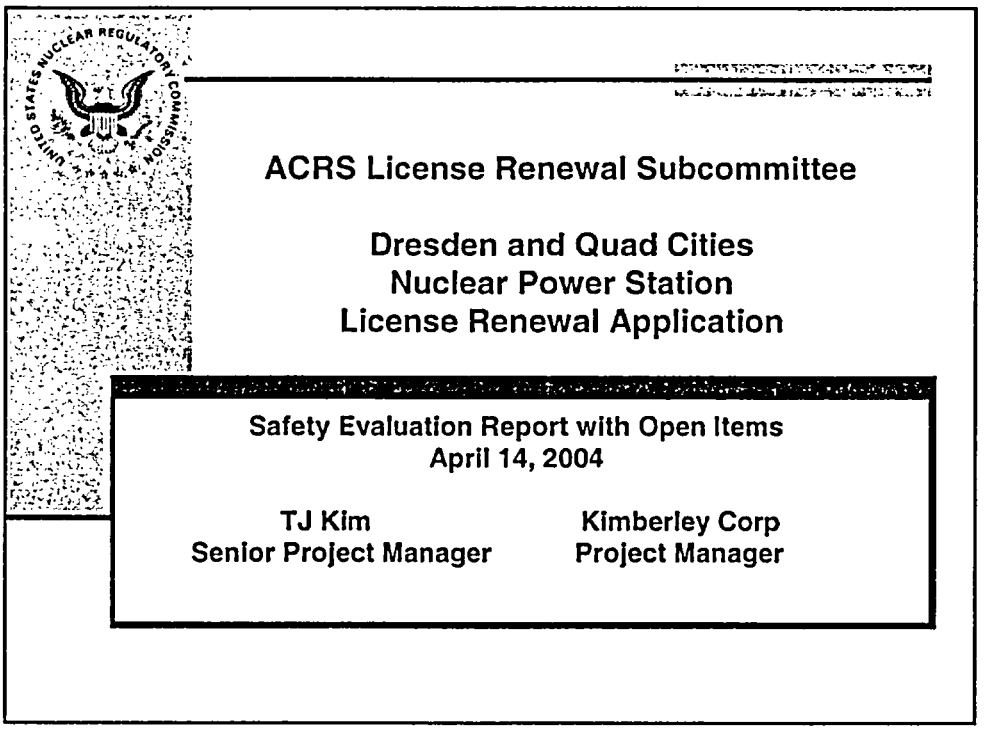
TLAA Summary

- The applicant has identified the appropriate TLAAs and has demonstrated or is committed to demonstrate that the TLAAs:
  - Will remain valid for the period of extended operation
  - Have been projected to the end of the period of extended operation, or
  - The aging effects will be adequately managed for the period of extended operation

Staff Conclusions

Pending the resolution of the 5 Open and 16 Confirmatory Items, the Applicant has met the requirements for license renewal, as required by 10 CFR 54.29:

- Actions have been identified and have been or will be taken such that there is reasonable assurance that activities will continue to be conducted in the renewal term in accordance with the current licensing basis
- The applicable requirements of 10 CFR Part 51 have been satisfied
- Matters raised under 10 CFR 2.758 have been addressed


ACRS License Renewal Subcommittee
Dresden and Quad Cities
Nuclear Power Station
License Renewal Application
Safety Evaluation Report with Open Items
April 14, 2004
TJ Kim
Senior Project Manager
Kimberley Corp
Project Manager