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UNITED STATES NUCLEAR REGULATORY COMMISSION'S

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

September 9, 2004

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1 UNITED STATES OF AMERICA

2 NUCLEAR REGULATORY COMMISSION

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4 ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

5 (ACRS)

6 515th MEETING

7 + + + + +

8 THURSDAY,

9 SEPTEMBER 9, 2004

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11 ROCKVILLE, MARYLAND

12 + + + + +

13 The Committee met at the Nuclear Regulatory

14 Commission, Two White Flint North, Room T2B3, 11545

15 Rockville Pike, at 8:30 a.m., Dr. Mario V. Bonaca,

16 Chairman, presiding.

17 COMMITTEE MEMBERS:

18 MARIO V. BONACA, Chairman

19 GRAHAM B. WALLIS, Vice Chairman

20 GEORGE E. APOSTOLAKIS, Member

21 F. PETER FORD, Member

22 THOMAS S. KRESS, Member

23 GRAHAM M. LEITCH, Consultant

24 DANA A. POWERS, Member

25 VICTOR H RANSOM, Member

1 COMMITTEE MEMBERS: (cont.)

2 STEPHEN L. ROSEN, Member

3 WILLIAM J. SHACK, Member

4 JOHN D. SIEBER, Member

5

6 ACRS STAFF PRESENT:

7 JOHN T. LARKINS, Executive Director

8 SAM DURAISWAMY

9 MARVIN D. SYKES

10

11 NRC STAFF PRESENT:

12 BILL BATEMAN, NRR

13 FRANK GILLESPIE, NRR

14 T.J. KIM, NRR

15 PT KUO, NRR

16 LOUISE LUND, NRR

17 EMMETT MURPHY, NRR

18 JIMI T. YEROKUN, RES

19

20 ALSO PRESENT:

21 WILLIAM H. BOHLKE, Exelon

22 ELLIOTT FLICK, Exelon

23 FRED POLASKI, Exelon

24 JIM RILEY, NEI

25 ROB STACHNIAK, Exelon

1 I-N-D-E-X

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1 P-R-O-C-E-E-D-I-N-G-S

2 8:29 a.m.

3 CHAIRMAN BONACA: Good morning. The
4 meeting will now come to order. This is the first day
5 of the 515th Meeting of the Advisory Committee on
6 Reactor Safeguards. During today's meeting, the
7 Committee will consider the following: final review of
8 the license renewal application for the Dresden and
9 Quad Cities nuclear plants, proposed changes to the
10 license renewal program, proposed technical
11 specifications related to steam generator tube
12 integrity, safeguards and security matters, and
13 preparation of the CRS reports.

14 A portion of this meeting will be closed
15 to discuss safeguards and security matters. This
16 meeting is being conducted in accordance with the
17 Federal Advisory Committee Act. Dr. John Larkins is
18 the Designated Federal Official for the initial
19 portion of the meeting. We have received no written
20 comments or requests for time to make oral statements
21 from members of the public regarding today's session.

22 A transcript of portions of the meeting is
23 being kept. It is requested that speakers use one of
24 the microphones, identify themselves, and speak with
25 sufficient clarity and volume so that they can be

1 readily heard.

2 I will begin with some items of current

3 interest. You have in front of you items-of-interest

4 package with a pink cover. And in it, you'll see that

5 there is a SECY. It has to do with safety-conscious

6 work environment. We have been talking about certain

7 culture, and this is interesting. This is a good

8 document to review. There is a speech from Chairman

9 Diaz and then other information. You may note among

10 the U.S. news that Admiral Bowman that we worked with

11 for the Virginia Class submarine is now the President

12 and CEO of NEI.

13 MEMBER SIEBER: (Speaking off mic.)

14 CHAIRMAN BONACA: Right. Among the other

15 announcements I would like to make is Ms. Mugeh

16 Afshar-Tous has been with the CRS since July 12th of

17 this year. She's a permanent employee. She started

18 her federal employment at the Department of the Navy

19 in 1991. She worked as a computer programmer for

20 Naval Sea Systems Command for six years and

21 transferred to the Navy Shore Installations, where she

22 worked as a program analyst for seven-and-a-half

23 years. She holds a Master's degree in information

24 systems technology and a second Master's degree in

25 public administration, and she is a senior program

1 analyst for Operations Support Branch. Welcome
2 aboard.
3 I also would like to welcome Richard
4 Bright. He's a new employee for the CRS staff. He has
5 been with the CRS and CNW since July 26th of this
6 year. In 2002, he graduated from the University of
7 Maryland, Baltimore County, with a Bachelor's degree
8 in information systems. His background in the
9 application development, where he worked as an intern
10 for Ameritrade as an Oracle developer for the
11 Windermere Group. He's currently working on his
12 Master's degree in business administration. He is the
13 IT specialist for the CRS and CNW office. Welcome
14 aboard, too.
15 Okay. So with that, we will move to the
16 first -- unless there are any questions or comments,
17 we'll move to the first item on the agenda, and it has
18 to do with the final review of the license renewal
19 application for the Dresden and Quad Cities nuclear
20 plants. For that, I will turn to Mr. Kuo.
21 DR. KUO: Thank you. Dr. Bonaca, and good
22 morning. For the record, I'm PT Kuo, the program
23 Director for the License Renewal and Environmental
24 Impacts Program. To my right, Frank Gillespie, the
25 Deputy Director for the Division of the Regulatory

1 Improvement Programs. And to my far right is T.J.
2 Kim, the former project manager for Dresden Quad
3 Cities license renewal.
4 Today, we have a two-part presentation for
5 the Committee. The first part is Dresden Quad Cities
6 license renewal project, and the second part is our
7 process improvement self assessment. And after break,
8 we will do that.
9 The staff has completed the safety
10 evaluation for Dresden Quad Cities license renewal
11 application, and T.J. will lead the staff presentation
12 on the result of the evaluation today. T.J., as I
13 said, is a former project manager, who, after the last
14 ACRS Subcommittee meeting, and since then he has been
15 selected to serve in the EDO office. But he has
16 gracefully agreed to come back and to make this
17 presentation for the reason of continuity. We greatly
18 appreciate the effort for maintaining that continuity.
19 During the last ACRS Subcommittee meeting,
20 there were five open items in the SER. And since the
21 last subcommittee meeting, we have resolved all the
22 five items. There's no open items outstanding
23 anymore.
24 During the committee meeting last time,
25 the staff also committed to provide the committee some

1 additional information for a few issues. And we have
2 provided this additional information to the committee
3 last month, and I believe you have a copy in front of
4 you.
5 And our tech staff, the experts are all
6 sitting in the audience and will answer any questions
7 you might have with regard to the issues. So with
8 that, I will first turn the presentation over to
9 Exelon and then followed by T.J.'s presentation.
10 CHAIRMAN BONACA: Thank you.
11 MR. BOHLKE: Mr. Chairman, members of the
12 ACRS, good morning. I'm Bill Bohlke, Senior Vice
13 President of Exelon Nuclear, and I'm joined by key
14 members of the project team, which has prepared the
15 license renewal application for Dresden Quad Cities,
16 which we are discussing this morning. I'd like to
17 introduce the speaker who will follow me. Fred
18 Polaski to my immediate left is the manager of license
19 renewal for Exelon, and Rob Stachniak to my right is
20 the project leader for the Dresden Quad Cities license
21 renewal application.
22 CHAIRMAN BONACA: Could I interrupt for
23 just a second? I forgot to mention that in attendance
24 we have today Mr. Graham Leitch. He's now a member of
25 the CRS. He joined just about a month ago, but he's

1 a consultant to the CRS, particularly in the license
2 renewal process or applications, and he's sitting here
3 as a consultant for us. So he will participate in the
4 proceedings, and he may have questions or comments.
5 MR. BOHLKE: Yes. We remember Mr. Leitch
6 from our subcommittee presentation.
7 CHAIRMAN BONACA: And in fact he led those
8 presentations, so we wanted to maintain continuity in
9 this application. Sorry for interruption.
10 MR. BOHLKE: That's fine. Second slide is
11 the agenda, which I will not read. You can see that
12 we're hitting the very highest points of our rather
13 detailed license renewal application.
14 Next slide. Just a summary of the plant
15 description. The four units are early BWR-3s from GE.
16 All four units have Mark I containments. Dresden has
17 the isolation condenser, Dresden being the original
18 BWR-3, and that constitutes the most prominent
19 difference among the four units.
20 Both stations are freshwater-cooled. Quad
21 Cities from the Mississippi River. Dresden is a
22 closed-cycle cooling system with a lake for the
23 predominant months of the year. From mid-June until
24 mid-September, it runs through the lake, taking
25 suction from the Kankakee and discharging to the

1 Illinois River.

2 All four units are licensed at a power

3 level of 2957 megawatts thermal. Dresden's licenses

4 expire in 2009 and 2011. Quad Cities licenses expire

5 in 2012.

6 We have previously presented to you our

7 extended power upgrade applications, and the power

8 upgrades were achieved in 2001 at Dresden 2, in 2002

9 at Dresden 3, and Quad Cities Units 2 and 1

10 respectively. Just as an aside but related to our

11 application, Dresden Unit 1 continues its safe store

12 condition. However, a portion of the Unit 1 fire

13 protection system supports Unit 2 and 3. And as such,

14 that system and its components have been subsumed into

15 the Dresden 2 and 3 maintenance rule activities and is

16 in scope for license renewal.

17 Next slide. I'd like to spend a minute

18 talking about the recent operating from a regulatory

19 context for the Dresden and Quad Cities stations. All

20 units are green with respect to all of the reactor

21 oversight performance indicators. The Dresden units

22 are white, except for the two exceptions that I'll

23 cite below.

24 Dresden 3 is white for high-pressure

25 coolant injection system unavailability. That relates

1 to a water hammer event from July 2001 and the
2 subsequent recovery from that event, so it went white
3 in the late third quarter of 2001. Since that time,
4 all the corrective actions have been achieved. The
5 system is meeting its performance indicators. Should
6 that performance sustain to the end of the month, we
7 expect that indicator to return to green.
8 MEMBER POWERS: How does the condition
9 probability change for the unavailability of high
10 pressure cooling reduction?
11 MR. BOHLKE: High pressure is a main
12 contributor in BWRs. However, Dresden, with its
13 isolation condenser system, has an added advantage,
14 which makes the contribution from that somewhat
15 smaller than you would expect from other comparable
16 BWRs. I don't have a quantitative answer to that.
17 Early this year, Dresden Unit 2 entered a
18 white condition for unplanned scrams, and that is a
19 result of having a number of scrams within a pre-
20 defined period of time. The Dresden station and
21 Exelon Nuclear corporate staff did extensive work to
22 understand the root causes for each of the scrams and
23 did a common-cause analysis for not only the Dresden
24 Unit 2 scrams but also any scrams on Dresden Unit 3.
25 And as a result of that, we've taken some steps to

1 strengthen our processes in our organizations to
2 attempt to mitigate those. With respect to any
3 material condition deficiencies, those have been
4 worked through.
5 MEMBER POWERS: What were the specific
6 causes for the unplanned scrams?
7 MR. BOHLKE: There were four, and I'm not
8 going to, I'm going to let Elliott Flick, who is the
9 system engineering manager from Dresden, address in a
10 high-level summary what the four incidents were.
11 MR. FLICK: Hi. I'm Elliott Flick, the
12 plant engineering manager at Dresden. There were
13 actually three, Bill, common causes. The main cause
14 was associated with operational decision-making. And
15 the way that we termed it, it impacts the decisions
16 not fully evaluated with contingency measures being
17 put in place. So in other words, if you had a
18 situation where we were going to go out and perform a
19 test, it could be that that test put us into maybe a
20 half-trip situation, but there would be other
21 maintenance going on in the plant, which could affect
22 the --
23 MEMBER POWERS: This is the kind of error
24 or planning that leads to things like the Chernobyl
25 accident?

1 MR. FLICK: I don't believe so in this
2 case, but --
3 MEMBER POWERS: I mean, it's a test that
4 wasn't fully thought out.
5 MR. FLICK: So I'm talking situations
6 where operational decisions can be made in the way
7 that you schedule maintenance. You can put yourself
8 into a situation where you could potentially have
9 another piece of equipment trip out of service as a
10 result of the maintenance. So what we've done is
11 we've put in place processes that we are strengthening
12 our operational decision-making practices by
13 evaluating all of the maintenance that's taking place
14 at the plant and emergent maintenance.
15 MEMBER POWERS: I mean, wouldn't this have
16 occurred a long time ago by the maintenance rule?
17 MR. BOHLKE: Dr. Powers, we're talking
18 about the conduct of regularly-scheduled surveillance
19 activities while there may be another hardware prone
20 going on. And certainly those are evaluated using
21 ORAM and SENTINEL and risk base, but there are ways of
22 configuring the plan or scheduling activities that can
23 even mitigate things that are nominally acceptable.
24 And I think that's what we're talking about, a more
25 thorough and in-depth evaluation to make sure we've

truly considered all of the contingent issues that might affect the conduct of those activities.

MR. FLICK: The second issue had to do with testing and monitoring program weaknesses in terms of troubleshooting, and it's related to the first issue, where we may be doing troubleshooting on a component, but we hadn't gone through an operational decision-making process to make sure that we understood fully what are all the other configurations in the station.

And the third one had to do with root-cause analysis being narrow in scope. So while we got to the root-cause analysis of each of the individual things that we may have been doing a root-cause analysis on, for instance any of the scrams that led to this particular white indicator, we weren't really looking for, oddly enough, what are the other management-related issues and other things that are out there. So we went right for the heart of it instead of being very broad-stroked and making sure that we were addressing other broader issues. So we've taken action to correct all three of those at the station.

MEMBER APOSTOLAKIS: Do you have a risk monitor in the plant?

1 MR. BOHLKE: We use ORAM and SENTINEL.

2 MEMBER APOSTOLAKIS: Sorry?

3 MR. BOHLKE: ORAM and SENTINEL.

4 MEMBER APOSTOLAKIS: Well, that's not a

5 risk monitor, is it?

6 MR. BOHLKE: That's what we use for

7 maintenance rule assessments.

8 MEMBER POWERS: Well, I mean, there's a

9 reason for asking these questions, and that is: now

10 you're going to embark on some expanded programs for

11 aging management, which is even going to complicate

12 your life further. How do you handle this?

13 MR. FLICK: Well, all of the license

14 renewal programs that are being implemented are being

15 integrated fully into our action-tracking program and

16 into our maintenance processes. So they will be

17 evaluated through all of the same programs that Mr.

18 Bohlke just described.

19 MEMBER POWERS: I mean, you can see where

20 my trouble is. 5065 has been around, or the

21 maintenance rule has been around since the dawn of

22 time here. And that's not fully integrated

23 apparently, and now you're going to add some more

24 programs. And you tell me that's fully integrated.

25 I mean, how do I know that this is fully integrated

1 and you're not going to end up with the same kind of
2 problem here?
3 MR. BOHLKE: The answer is that we're
4 continuing to progress and continuously to improve in
5 how we handle our processes and integrate them. What
6 we're talking about here is really where are we with
7 respect to the standard of true excellence. And while
8 we may consider ourselves good, and in some cases very
9 good, we know that we're not as robust in all areas
10 that we need to be. The results of the common-cause
11 analyses that Elliott described pointed to places
12 where the organization needed to strengthen, not
13 necessarily individual skills need to be strengthened
14 or individual process needed to be improved but how
15 they all fit together.
16 Now, the maintenance process and the
17 governing work control process, which schedules the
18 maintenance, have been made very robust over time.
19 And we believe that the additional programmatic
20 requirements of the maintenance rule, while perhaps
21 extensive in some context, are not so sophisticated
22 and confusing that they can't be handled by that
23 process. In fact, I think they fit in quite well
24 because they're all a result of a procedural framework
25 and structure that we use to conduct these activities.

1 We don't really have apprehensions along those lines,
2 Dr. Powers.
3 MEMBER POWERS: Damn it, I do. I'm just
4 looking at the brute force face of things and saying
5 how do I know? I'll take you at your word. You
6 learned from your mistakes and you're better. Just
7 recognize now you've got to get a whole lot better
8 because you're taking on more and more activities.
9 MEMBER APOSTOLAKIS: I have a root-cause
10 analysis of one of the scrams. You said that it was
11 not as complete as it should have been because it
12 didn't get into organizational issues. How did you
13 decide that it was incomplete, that you had to get
14 into these things? What is it that prompted you to
15 say, "Well, gee, we didn't go deeply enough?"
16 MR. FLICK: Well, when we went back and
17 took a look at each of -- for instance, we went back
18 for each of the scrams for the last year on both units
19 and took a look at the root-cause analysis associated
20 with those and looked for commonalties among them.
21 And when we saw that we had an organizational weakness
22 in regard to operational decision-making but that that
23 hadn't specifically come out of any one of the
24 individual root-cause analysis, we recognized that we
25 weren't doing as well as we should with regard to

1 looking more broadly at what are some of the
2 organizational type of impacts that could have
3 contributed to the root cause. So maybe there was an
4 equipment failure that caused the plant to trip
5 offline, and we nailed the root cause for why the
6 equipment failed and took care of fixing that, but
7 maybe there were management-related things about the
8 way that we did different things that didn't show up
9 in the write-up, that the team wasn't even really
10 chartered to look more broadly.
11 So what we've done now is we're assigning
12 a senior station manager to every one of any root
13 cause that gets done at the plant, and a charter is
14 being set up such that it's much more broad than we
15 would have done that in the past. So we're looking
16 for organizational weaknesses, as well as what is the
17 thing that caused the problem.
18 CHAIRMAN BONACA: It surprises me. I
19 mean, if you're talking about a root cause, you know,
20 itself, that the commission should be broad. It
21 should look for the root cause.
22 MR. FLICK: Right.
23 CHAIRMAN BONACA: And I don't understand
24 how you have a narrow root cause versus a broad root
25 cause. I mean, well, I have a question regarding

1 this, and it has to do with did this testing and
2 monitoring have to be done at power, or is it some
3 testing and monitoring that you used to do during
4 shutdown and now you're doing a power because you're
5 using, you know, what you're allowed to do, if you
6 evaluate the risks associated with that?
7 MR. FLICK: Well, I would use the example
8 of we did some troubleshooting on a controller for the
9 Stator Water System because we recognized that there
10 was erratic behavior of the controller causing one of
11 the valves to oscillate. So we were doing
12 troubleshooting on the valve without fully
13 understanding what's the worst-case thing that can
14 happen to that valve while we're doing troubleshooting
15 on it. As it turned out, the worst-case thing did
16 happen, which was the valve closed in this instance,
17 and we ended up having a run-back on the turbine. So
18 that's an example.
19 MEMBER LEITCH: This is Graham Leitch. I
20 had a question about troubleshooting. You've
21 mentioned a couple of times that some of these
22 problems occurring during troubleshooting. My
23 question is, basically, do you have a rigorous
24 troubleshooting procedure, particularly one that
25 defines the boundaries of the troubleshooting?

1 Because, in my experience, I've found that oftentimes
2 during troubleshooting, it's easy to go a little
3 beyond the people that are trying to find the problem.
4 Troubleshooting, by its very nature, you don't know
5 exactly what's wrong, and people are trying to find
6 the problem, and they're often tempted to go, "Well,
7 let's just check this one more thing," which is beyond
8 the bounds of a clearly-defined procedure. And I
9 guess my question is do you have a troubleshooting
10 procedure and does it clearly define the boundaries of
11 that troubleshooting and what one must do if, in order
12 to properly troubleshoot, you find you have to exceed
13 the bounds of that procedure?
14 MR. FLICK: Yes, we do have a corporate-
15 wide across Exelon troubleshooting process, and it's
16 basically based on using Kepner-Tregoe type analysis
17 for getting through what are the possible things that
18 could be the problem. We integrate that into our
19 maintenance processes, so any of the steps that are
20 going to be done for troubleshooting are reviewed
21 against maintenance rule and risk. And then, further,
22 what we are doing now is, before we go and actually
23 execute any troubleshooting, in addition, we're using
24 our operational decision-making to really understand,
25 okay, what is the worst-case thing that can happen,

1 what are the contingencies we need to have in place to
2 make sure we have a full understanding of what exactly
3 is it that's going to take place step-by-step for the
4 people that are going to do it and, you know, are they
5 ready to go. Everything like that to make sure that
6 we're fully ready to go before we do that.
7 MR. BOHLKE: Okay. To conclude on this
8 area, the period at which this number of unplanned
9 scrams exceeds the threshold will expire at the end of
10 December. And should the performance again sustain,
11 we'd expect this indicator also to return to green in
12 the fourth quarter of this year.
13 MEMBER APOSTOLAKIS: So the inspections
14 have not found anything? It was just performance
15 indicators other than green regions?
16 MR. BOHLKE: The inspection activities
17 have basically confirmed the things that we found from
18 our analyses of the root causes and the common causes.
19 There was no other evidence found that would cause us
20 to come to a different conclusion or go in a different
21 direction.
22 Let's talk about steam dryers. You have
23 heard previously and we discussed somewhat in
24 subcommittee about our difficulties with the steam
25 dryers principally at Quad Cities. We are in the

1 process of designing and fabricating replacement steam
2 dryers for the Quad Cities unit, and the current plans
3 are to replace them in 2005 at both units. This new
4 design will address some of the significant
5 contributors, we believe, to the situations that are
6 out there. First of all, configurationally, we're
7 talking at Dresden Quad Cities about some of the
8 oldest steam dryers in the BWR-3 regime, and that
9 particular configuration called a square-hood design
10 has been shown not to be as robust as the new curved-
11 hood design that's been used on the BWR-6 and ABWR
12 units. So our design will be the latest
13 configurationally.
14 In addition, we're paying a lot of
15 attention to where the strength of the dryer is and
16 what the load paths are for the dryer. So the re-
17 design of the dryer will significantly reduce some of
18 the stress concentration points that those old dryers
19 were subject to. We're going to have dryers that are
20 more robust because the plate thickness is going to be
21 bigger and we'll be moving the stresses away from some
22 of the weak points in the wells and distributing them
23 more evenly through the steam dryer.
24 VICE CHAIRMAN WALLIS: You mean that the
25 maximum stress occurs further away from the welds?

1 MR. BOHLKE: Yes.

2 VICE CHAIRMAN WALLIS: You don't really
3 transfer stress?

4 MR. BOHLKE: Yes, okay, correct. Thank
5 you.

6 VICE CHAIRMAN WALLIS: But the reason that
7 the dryers were in trouble, it seems to me, was
8 structure and direction. And all the other slide
9 addresses is making these things stronger. But if
10 they then resonate more than they did before with the
11 fluid, they might be worse off. So we want to bring
12 the fluid into this story somehow.

13 MR. BOHLKE: I need to finish the story.
14 So we have, of course, field operating data, which
15 have been historically collected on first-of-a-class
16 dryers. The more recent examples of that are the
17 dryers at 1-F-1 over in Japan, dryers at Susquehanna
18 here, and then dryers at KK-6 and 7 in Japan. So
19 we've got more data that we're able to apply to the
20 design.

21 We have put together a scale model testing
22 rig out at San Jose, and we've been able to test that
23 at equivalent to full EP flow, and that's been useful
24 in pointing out some areas that simply don't pop out
25 at you from first principles or thinking about it. So

1 we've been able to make the dryers more robust.

2 And then, finally, we have been exploring

3 quite aggressively this acoustic coupling that we

4 think we have within the main steam leads going out to

5 the steam chest and back, which appears to be a major

6 contributor to the flow-induced vibration loads and

7 the fatigue loads that the dryer, in fact, sees. So

8 we're using --

9 VICE CHAIRMAN WALLIS: The acoustics of

10 the steam line transfer all the way back through all

11 of this body --

12 MR. BOHLKE: Apparently.

13 VICE CHAIRMAN WALLIS: All the way back to

14 the place where it breaks?

15 MR. BOHLKE: As difficult as that appears

16 to be, the answer also appears to be yes. There is a

17 contribution there that's present in the particular

18 configuration we have at Quad Cities coupled with the

19 configuration of the dryers inside the reactor vessel.

20 MEMBER ROSEN: Is that something you found

21 in the testing?

22 MR. BOHLKE: We have been instrumenting

23 the main steam leads at Quad Cities over the past year

24 or so to try to get insights. I don't have the

25 specific data to talk about.. We don't really have the

1 steam dryer designers to talk about it either. But
2 we're using all of the data that we have been able to
3 collect and formulating that as inputs to the models,
4 confirming them in the scale model testing, and also
5 trying to replicate those in this acoustic model.
6 MEMBER ROSEN: There's two kinds of
7 testing you're doing. One is the in-plant testing you
8 just described with the steam lines, and then this
9 scale model testing that I assume you did back, that
10 GE did in San Jose?
11 MR. BOHLKE: Yes.
12 MEMBER ROSEN: And I was trying to find
13 out whether which of those efforts detected this
14 acoustic coupling. The question goes well beyond Quad
15 Cities, though, because we're thinking about dryers in
16 general for other plants, as well. Do you have any
17 insight on that, Bill?
18 MR. BOHLKE: The way I want to answer
19 that, Mr. Rosen, is that we began to conclude that
20 there must be some other drivers in there, and this
21 acoustic phenomenon was a principal suspect, and we
22 had been pursuing it aggressively. And the experts in
23 that regard can show, through modeling, and that there
24 can be some appreciable loads transmitted back and
25 forth in the system, and we're using the results of

1 that as part of the inputs to the design of the
2 dryers. And when we start up, we'll have a big
3 instrumentation kit on these dryers, analogous to what
4 dryers had when they first passed dryers, so we will
5 have a full cycle of operating data on it, which will
6 really be indicative of what's going on in there and
7 help us make better models and confirm load paths.
8 MEMBER ROSEN: So you'll have a fully-
9 instrumented dryer, but you'll also have an instrument
10 to steam lines?
11 MR. BOHLKE: Yes.
12 MEMBER ROSEN: So you might get quite a
13 bit of information from --
14 MR. BOHLKE: And then we couple that with
15 a full inspection, full visual and, in some cases,
16 volumetric inspection of the dryer after its first
17 operating cycle, and that ought to give us a pretty
18 good set of information to say yes, you've bounded the
19 loads and your dryer is going to be good to go. In
20 fact, that's what the next slide is all about.
21 CHAIRMAN BONACA: Yes, I was looking at
22 that.
23 MR. BOHLKE: So we expect that's going to
24 be the case. We expect that with the configuration of
25 the dryer, with the better distribution of loads in

1 the dryer with the more robust material that this
2 dryer is going to be a good performer, and we'll
3 confirm that after the first cycle.
4 CHAIRMAN BONACA: What gives you, however,
5 the confidence to say that, after you do
6 instrumentation and, you know, this new dryer, so they
7 may be able to go a longer way but not necessarily for
8 the whole time. What gives you the confidence that
9 leads you to the last bullet? You either want to
10 include it in the license renewal.
11 Let me just give you my thought process
12 here. You really don't know yet what the actual root
13 cause of the failure is. You know, you have a number
14 of theories, and you're going to test them. You're
15 going to do some testing for a cycle. You may not
16 have yet the failure of the dryer caused by that. We
17 know that, for the current dryers, you have pieces
18 going through some safety-related equipment, and,
19 therefore, the dryers seem to, you know, if they are
20 to fail and to fall into pieces, seem to fall into
21 categories of components that are not safety-related
22 but they could cause the failure of safety-related
23 components. So that seems to be, you know, to be long
24 in the scope of license renewal. What gives you the
25 confidence to say that they will not, in fact, break

1 in the future as they have done in the past, and,
2 therefore, you don't want to put them in the scope? I
3 don't understand why you have that confidence.
4 MR. BOHLKE: Well, for two reasons. First
5 of all, we'll be able to demonstrate that it's far
6 more robust. I think we'll be able to provide a
7 better quantification of the loads that the dryer has
8 seen when we get all the data and put it all together.
9 So that's one.
10 The second thing is we look at the dryers
11 every time we take them out and, in fact, BWRVIP is
12 developing a steam dryer inspection guideline, which
13 will be completed and submitted for staff review and
14 will be applied because, of course, we apply all of
15 the guidelines that the BWRVIP issues.
16 CHAIRMAN BONACA: Yes.
17 MR. BOHLKE: But that will be the best
18 program of all.
19 CHAIRMAN BONACA: But it seems to me that,
20 you know, what you have to think about is the
21 guideline may say something for a dryer that is
22 operating at the original power level and it may say
23 something else later on in time whenever we learn more
24 about what is happening about the dryer that is now
25 running with a much higher flow rate, steam-flow rate.

1 And it may say, for example, that you have to do more
2 frequent inspections, or you may say that, you know --
3 what I'm trying to say is that there is a connection
4 that I see here with aging of components, license
5 renewal and commitments. I don't see this as a
6 painful commitment. You're telling me that you're
7 looking at the dryer every time you open up the plant,
8 so I don't understand why it should be in the scope of
9 license renewal.
10 MR. BOHLKE: The VIP commitments are
11 current-term commitments, and this will become a VIP
12 commitment and kept in that context, as opposed to
13 something that is a specific application for the
14 license renewal period. So I don't think we're
15 arguing about anything substantial, just the labels
16 we're putting on it. If we're doing the inspections
17 that the guidelines suggest, that should provide
18 reasonable assurance that we know what the condition
19 of the dryer is, which is what we're looking for.
20 CHAIRMAN BONACA: But, you know, again, I
21 want to look at that commitment. And then I was
22 looking at the BWR, all those group presentations of
23 August 18th on power upgrades, and you're familiar as
24 I am with that presentation, I'm sure. And it talks
25 about a lot of more understanding we have about the

1 effect of extended power upgrades on plants. It talks
2 about 17 component failures identified that relate to
3 power upgrades. It talks about potential for
4 decreasing time between failures. It talks about
5 other known issues not identified by BWR survey, but
6 they have been after the survey, electromatic relief
7 valve actuator, limiter valve. These are failures
8 that are solved because of power upgrade.
9 It talks about an unexpected increase in
10 component wear. It talks about 52 events to which
11 power upgrades directly or indirectly contributed. I
12 mean, there is a different operating experience here
13 that comes up that relates to power upgrades that's
14 not reflected in your application. And to me, the
15 steam dryers fall in the same category. Your
16 application doesn't reflect experience of the extended
17 power upgrade. It reflects only the experience of the
18 regular power.
19 So I'm trying to understand, you know, how
20 come you're sure that none of these issues should
21 cascade into a commitment for license renewal? For
22 example, a change in a plan, frequency of inspection,
23 particularly when you're talking about accelerated
24 wear of components. I don't know if you have an
25 answer to that.

1 MR. BOHLKE: My only answer, Dr. Bonaca,
2 is that we have to deal with them today and now,
3 irrespective of the license renewal period. They're
4 part of our maintenance and engineering and, in some
5 cases, operational activities. And that, in our mind
6 at least, distinguishes them from commitments that are
7 made solely because the license is being extended for
8 20 years.
9 So it's sort of a legalistic thing, but I
10 don't mean to try to depend on that. What I would
11 prefer to do is give you the assurances that we're
12 going to be appropriately rigorous in trying to make
13 sure that the material condition of the dryers will
14 support each cycle that we start operating on and
15 continue that indefinitely until the plants cease to
16 operate.
17 CHAIRMAN BONACA: Again, you know, we're
18 focusing on the dryer, but I opened it up because, I
19 mean, this report I think is a very good report. I
20 think it's an honest presentation that shows that
21 there is focus and attention of the consequences. So
22 we're learning about extended power upgrades and, you
23 know, I will expect four or five years from now there
24 will be substantial information there gathered by, you
25 know, let us continue the effort of the BWROG. And I

1 would expect that you'll see some impact maybe on some
2 of the reports. Something says that, you know, if you
3 went to an extended power upgrade, you have to do
4 something else. Maybe you have to change your problem
5 that inspects something and so on and so forth.
6 Particularly this issue of reduced time between
7 failures, it has to do with the frequency of
8 inspections and how far you test and so on and so
9 forth.
10 Right now, we don't have this information.
11 I mean, this is the first presentation we've ever seen
12 with this kind of information here. Wouldn't it be a
13 problem, for example, you know, if you get approval
14 for a power upgrade for license renewal that, before
15 you walk into it, you do an evaluation of what you
16 know at that time and see if your problems should be
17 changed or adjusted somewhat?
18 MR. STACHNIAK: Dr. Bonaca, this is Rob
19 Stachniak. Our position has been that if the dryer is
20 designed properly, there will be no failure, and that
21 is what we are working on right now: designing a dryer
22 for Quad Cities that will not fail at all. What we've
23 said is that we're going to replace them, instrument
24 them, gather all this information, and we will make
25 the determination. And if we're convinced that we

1 have a structurally-sound dryer and all of the data
2 supports that, we will keep them out of license
3 renewal. However, if we can't reach that conclusion,
4 we've agreed we will put them and apply the
5 appropriate aging management. So I don't think we're
6 really disagreeing with your position.
7 CHAIRMAN BONACA: First of all, I opened
8 up the issue, the broader issue right now. I mean,
9 I'm sure you participated in this because your plants
10 are quoted here as participating in the survey, so I'm
11 interested in the feedback in a broader sense. There
12 are other issues there, many components. Graham, you
13 were looking, you had some observation on some of the
14 components.
15 MEMBER LEITCH: Yes. I don't recall the
16 likelihood of failure being a criteria for whether an
17 item should be included in the scope or not. The
18 criteria is basically could this failure result in a
19 failure of a safety-related component? And I think in
20 this case the answer is yes. Is it passive? And I
21 think in this case the answer is yes. And is it long-
22 lived? And I think in this case the answer is yes. So
23 I would think, regardless of what the likelihood of
24 failure is, the dryers should be included in the
25 scope.

1 Now, the likelihood of failure may impact
2 the frequency of inspections, but I don't think it
3 goes to the criteria of whether the dryer is or is not
4 in scope. I think it should be in scope.
5 MR. BOHLKE: Okay, thank you. That
6 completes my portion of the presentation, and now I'll
7 turn it over to Rob Stachniak.
8 MR. STACHNIAK: Good morning. Exelon was
9 requested to provide the ACRS with some general
10 information concerning major equipment replaces.
11 Slide number seven includes some of the major
12 equipment replacements that have occurred at both
13 sites.
14 MEMBER LEITCH: Excuse me. Just before we
15 leave the dryer issue, you talked about dryer
16 replacement at Quad, but what's the plan at Dresden?
17 I know the problem has not been as serious there and
18 perhaps of a different nature than Quad, but are you
19 planning to replace the Dresden dryers, as well?
20 MR. BOHLKE: At the present time, we do
21 not plan to replace the Dresden dryers. However,
22 we're building a third dryer as a spare, so we have
23 the capability to do that. For reasons that are not
24 yet completely understood, the loads experienced by
25 the dryers at Dresden appear to be lower and, in some

1 cases, substantially lower. And we hope to get a
2 better understanding of that before we make a final --
3 VICE CHAIRMAN WALLIS: Are they the same
4 design, or are they substantially different? They're
5 the same design, Dresden and Quad Cities' dryers?
6 MR. BOHLKE: The dryers are the same
7 design.
8 VICE CHAIRMAN WALLIS: The same design
9 and, yet, the experience is quite different? It
10 doesn't make any sense, does it? Same power, same --
11 MEMBER SIEBER: Well, the steam leads are
12 a different diameter between the points.
13 MR. BOHLKE: The steam leads are
14 different.
15 VICE CHAIRMAN WALLIS: That big an effect?
16 MR. BOHLKE: We are having a tough time
17 finding any other differences.
18 MEMBER SIEBER: It's probably why you want
19 to embrace the conclusion that you've got an acoustic
20 coupling.
21 MR. BOHLKE: Yes, that's what led us to
22 that. The thermohydraulics inside the vessels are
23 fundamentally identical.
24 MEMBER LEITCH: But when you operate Quad
25 Cities at 100-percent power, I know that you're not

1 there now, but when you do, are the turbine control
2 valves rock solid? Do we know the answer to that
3 question?
4 MR. BOHLKE: Bill Porter from our design
5 engineering management at Quad Cities is sitting
6 immediately to your right, and he's going to take a
7 shot at answering that.
8 MR. PORTER: Actually, we haven't seen
9 that much difference in our control operation. The
10 steam leads, when you're looking at the differences in
11 the physical arrangement and physical geometry of the
12 steam leads, there are some minor differences on how
13 we come up with some lines at the equalizing header,
14 which is what we call the D-ring, and we have seen
15 evidence that it's a possibility that the pressure
16 oscillations and feedback are affected by very small
17 changes in length, which are well within construction
18 tolerances when you look at the overall length of the
19 steam lines.
20 So we have looked at control valves,
21 oscillations and movements and so forth, and we don't
22 see a loaded gun there, if you will, that solves this
23 problem. We're still doing some testing. And the
24 other thing that's in here on this acoustic coupling,
25 as we're doing analytical acoustic analysis with some

1 of the input that we're doing, so we've still got to
2 find the absolute answer to that. And part of the
3 information from the dryer instrumentation should help
4 discern that.
5 MR. STACHNIAK: Slide seven --
6 VICE CHAIRMAN WALLIS: It makes it
7 difficult to design a dryer, and you're sure you can
8 design a dryer which won't break, but if you don't
9 really know why it breaks and you can't explain the
10 difference between these two plants, you're not on
11 very sure footing.
12 MR. STACHNIAK: That is why we are
13 instrumenting the first dryer that goes in.
14 MR. BOHLKE: We have back-engineered the
15 loads that must have been present to cause the
16 failures that we saw for all of the dryers, which
17 helps us get a feel for their magnitude. That has
18 been helpful. So it's not a complete absence of
19 knowledge, but it's a real understanding of how the
20 dryers vary with the different geometric
21 configurations or construction idiosyncrasies that
22 might be present in the plant. That's the confounding
23 part of this.
24 VICE CHAIRMAN WALLIS: Well, how do we
25 know this isn't your problem? How do we know how

1 another plant with the same dryer would behave, since
2 we've now got two prototypes that's very different?
3 How do I make a judgment about a third plant which has
4 a similar dryer?
5 MR. BOHLKE: Well, it's not just the
6 dryer, it's how it sits in the head of the vessel and
7 how the size of the steam leads and the routing of the
8 steam leads and the position of the steam chest with
9 respect -- there's a long --
10 VICE CHAIRMAN WALLIS: So you've got a big
11 organ pipe up there?
12 MR. BOHLKE: Yes, that's one way of
13 putting it. Exactly.
14 VICE CHAIRMAN WALLIS: Right, okay.
15 MR. STACHNIAK: And to conclude on this
16 particular topic, while I understand why you would
17 believe that the dryer should be in scope, literally
18 every dryer design across the country is non-safety-
19 related and documented on the design basis. So
20 further position of why we've taken the position we
21 have --
22 MEMBER LEITCH: But safety-related is not
23 the only criteria. It's safety-related or non-safety-
24 related items whose failure could impact the operation
25 of safety-related equipment. It's that second

criteria that makes me believe that the dryer should be in scope.

CHAIRMAN BONACA: I don't think there was ever expectation that they would come apart.

MR. STACHNIAK: Okay. On to slide seven. Slide seven does contain some of the major equipment replacements that have occurred at both sites. For example, reactor water clean-up piping at both sites was replaced with pipe resistant to intergranular stress corrosion cracking. At Quad Cities, the RHR service water piping was replaced due to an installation error that occurred during original construction. The reactor water clean-up piping on Dresden Unit 3 was replaced in 1987. I'm sorry, recirc piping, I'm sorry, due to ISGSCC.

The main power transformers have been replaced on three --

MEMBER POWERS: You leave me hungry for information. Why didn't you, I mean why just Dresden Unit 3?

MR. STACHNIAK: Because we ended up doing weld stress improvements on the other three units and found it to be just as effective at reducing --

MEMBER POWERS: Okay. So you found another way to do it that wasn't quite as expensive?

1 MR. STACHNIAK: Yes.

2 MEMBER POWERS: That's as effective.

3 MEMBER LEITCH: So the other three units

4 still have 304 stainless recirc piping?

5 MR. STACHNIAK: I believe that is true.

6 MEMBER LEITCH: And Dresden 3 has the 316

7 nuclear-grade recirc pipe?

8 MR. STACHNIAK: Yes.

9 MEMBER SHACK: And which stress

10 improvement process did you use on the others?

11 MR. STACHNIAK: Both the induced-heat

12 stress and the mechanical stress improvement. And

13 there have been follow-up assessments to verify their

14 effectiveness.

15 Carrying on, main power transformers have

16 been replaced on three of the units. The fourth unit

17 at Quad Cities is scheduled for replacement in the

18 spring of 2007. Dresden Unit 1 fire main piping was

19 replaced because the original piping could not pass

20 required friction-flow testing. We have installed and

21 are using hydrogen water chemistry zinc injection and

22 noble metal injections on all four units.

23 MEMBER FORD: Could I ask a question?

24 Apparently, you're using the of what chemistry

25 guidelines?

1 MR. STACHNIAK: Yes.

2 MEMBER FORD: Which does not require

3 corrosion-potential measurements in that document.

4 However, you are applying --

5 MR. STACHNIAK: Yes, we are.

6 MEMBER FORD: What commitment do you have

7 to continuing using corrosion-potential measurements?

8 MR. STACHNIAK: The staff brought this

9 question up quite a long time ago, and we have

10 committed to continuing on with that particular

11 commitment. Our procedures are annotated clearly that

12 this is a license renewal regulatory commitment that

13 we keep this activity sustained.

14 MEMBER FORD: Thank you.

15 VICE CHAIRMAN WALLIS: Can I ask about

16 this piping replacement? You said it couldn't stand

17 some friction testing.

18 MR. STACHNIAK: Yes. The original piping

19 that was installed in the fire main for Dresden Unit

20 1 was originally made of an asbestos-cement type of

21 pipe that was commonly used at the time. NFPA codes

22 do require friction-flow testing, and this section of

23 piping was not able to pass the testing, so the

24 decision was made to replace the header. And when

25 replacing the header, they found that the piping that

1 had been installed originally was undersized.
2 However, it's been replaced with the proper size.
3 VICE CHAIRMAN WALLIS: So they put the
4 wrong pipe in. It wasn't a case of where or --
5 MR. STACHNIAK: Correct.
6 VICE CHAIRMAN WALLIS: Okay.
7 MR. STACHNIAK: That is correct.
8 VICE CHAIRMAN WALLIS: So it took all this
9 time to find out they put in the wrong pipe?
10 MR. STACHNIAK: Well, as the testing
11 requirements became more stringent, it became obvious
12 yes.
13 And then, finally, core shroud hardware
14 was installed on all four units because of ISGSCC
15 tracking. Which brings me to slide number eight.
16 During the ACRS subcommittee meeting held in April of
17 this year, the subcommittee questioned whether the
18 repairs made to the core shroud hardware were
19 temporary in nature. The repairs are permanent and
20 final. The shroud repairs were installed within the
21 years of 1995 through '97 on all four units to
22 structurally replace the horizontal core shroud welds.
23 The repair hardware is designed for 40 years of life,
24 which will extend beyond the extended period of
25 operation.

1 The materials of fabrication, which are
2 austenitic alloys, INCONEL, and low-carbon type
3 stainless steels were all chosen because of their
4 resistance to IGSCC and the irradiation-assisted
5 stress corrosion cracking.
6 MEMBER SHACK: What data do you have that
7 shows these are resistant to IASCC?
8 MR. STACHNIAK: There was a considerable
9 amount of proprietary testing that General Electric
10 did. At staff's request, we did try to get copies of
11 it, which we were not able to get. However, the
12 materials were evaluated by the staff and the SERs
13 associated with the BWRVIPs for these repairs. And
14 that's about all the information I have.
15 MEMBER FORD: I was about to jump in when
16 they finished the list. Carry on.
17 MEMBER SHACK: When you say it's designed
18 for a 40-year life, what are the design criterias? Is
19 this a fluence design level? You're saying it doesn't
20 get the 5 times 10 to the 20 in 40 years?
21 MR. STACHNIAK: Yes. That's what we were
22 told, yes.
23 MEMBER SHACK: But the 5 times 10 to the
24 20 is sort of a pseudo threshold for austenitic
25 stainless steels. You've got materials here with

1 yield stresses that are probably at least twice those
2 of the austenitics. What makes you believe you have
3 the same fluence threshold?
4 MR. STACHNIAK: I believe the design for
5 these was, again, 10 to the 20. Our end-of-life
6 fluence is projected conservatively to not exceed 10
7 to the 19th, for one reason. Another, again, is the
8 test data which we were not able to get for
9 proprietary reasons, and I do not know to what extent
10 information was shared with staff when the designs
11 were approved in the SER. I'm afraid that's all the
12 information I do have.
13 MEMBER FORD: As far as my recollection is
14 concerned, I'm just jumping to your final and we see
15 that these materials and XM-19, etcetera, resistance
16 to IGSCC and, more significantly, IASCC. As far as I
17 know, there are no data on XM-19 under irradiation
18 conditions. Certainly, type 316L has cracked incores,
19 as we know only too well. And INCONEL X-750 uses
20 springs that crack. So I'm puzzled as to why you
21 should say that they are resistant to those two loads
22 and especially over the 14-year extended period from
23 now until the end of your extended license period. So
24 I'm puzzled as to why you're saying that.
25 My deeper concern is that, when you look

1 at the inspection criteria for the horizontal weld,
2 you're looking to inspect the horizontal welds, as I
3 understand it.
4 MR. STACHNIAK: Correct.
5 MEMBER FORD: So you have no idea what the
6 underlying structure is degrading. Should these rods
7 fail, you have no idea what the back-up is in terms of
8 structure integrity because you're not monitoring the
9 failure of the horizontal, are you?
10 MR. STACHNIAK: But the repairs, the
11 repair hardware structurally replaces those welds.
12 MEMBER FORD: Yes, but suppose that fails?
13 MR. STACHNIAK: What's that?
14 MEMBER FORD: Suppose the tie rods fail?
15 MR. STACHNIAK: Well, the tie rods are
16 included in --
17 MR. BOHLKE: I don't think we can really
18 defend the design here today. I mean, we've got
19 design reports which address failure loads, address
20 lifetime, address loads. And the conclusion of those
21 design reports is that, for each shroud with the
22 hardware installed to provide the vertical strength
23 across the horizontal weld, that they are adequate for
24 40 years of operation under the fluence conditions
25 that they experience.

1 MEMBER FORD: I understand what you're
2 saying, but my concern is these tie rods were
3 originally put in as a short-term fix, and there's a
4 good engineering fix for the short-term. Now we hear
5 that it is now good for 60 years or 40 years from now.
6 And, yet, we look down that list of reasons, and you
7 can pick holes in it left, right, and center. I just
8 pointed out I don't know the data for XM-19, and the
9 other two I know it will fail. Now, you may have
10 beefed it up. You may not have the stress levels, you
11 may not have the fluence levels, but these are all
12 ifs. I'm not sure what their rationale is, but I have
13 some problems.
14 MR. BOHLKE: The bottom line is that
15 whatever our misgivings may be, and I understand that
16 there may be some professional differences of opinion,
17 there is an inspection crew which is designed to
18 monitor the conditions of those to detect and
19 circumvent defects so that mitigating actions can be
20 taken or corrective actions can be taken.
21 MEMBER FORD: We should have shot across
22 their barriers to start with so they knew. Inspection
23 monitoring program is visual. It's not 100 percent.
24 It's taken off the first cycle, when you wouldn't
25 expect to have any fluence degradation, related

1 degradation of these components. And the next one is
2 ten years. What are the assurance that we have that
3 nothing is going to happen in ten years? And if it
4 does, what's the consequence? You've already got a
5 cracked core shroud underneath.
6 MR. STACHNIAK: Well, first of all, the
7 irradiation levels.
8 MR. BOHLKE: I don't think we can answer
9 that question.
10 MEMBER FORD: As I said, it's a question
11 for the staff.
12 MR. STACHNIAK: Okay. Moving on to slide
13 nine, Exelon does have the long-term asset management
14 plan in place that is updated yearly. It include all
15 Exelon nuclear plants and compliments our routine
16 preventative maintenance and performance-centered
17 maintenance. Slide number nine does contain some of
18 the examples of the type of items that are covered in
19 the Exelon long-term asset management plan. These are
20 preemptive replacements based on condition monitoring
21 data and trends.
22 Are there any questions? Then I would
23 like to turn the presentation over to Fred Polaski,
24 who will discuss commitment management.
25 MR. POLASKI: This is Fred Polaski. The

1 reason we're talking about commitment management is
2 the question has come up in the past about what's with
3 the new licenses in place, and we have committed to do
4 a lot of aging management in the future. How is that
5 going to be implemented? And the question often comes
6 up, well, how are you going to make sure that these
7 aren't forgotten or missed in the future over 20 - 30
8 years of operation?
9 The choice that we've made within Exelon
10 is that all of these commitments we've made for aging
11 management as part of license renewal are going to be
12 part of our commitment tracking system, our commitment
13 management system within Exelon. That is a process
14 controlled by our control procedures, which are
15 consistent with the NEI "Guideline for Managing NRC
16 Commitments," which has been endorsed by the NRC.
17 So all of these commitments will go into
18 that program. Any changes to any of the commitments
19 in the future would require a formal review and
20 evaluation and could go as far as, in some cases,
21 requiring prior NRC approval before we actually change
22 the commitment.
23 Going on to slide 11, for each plant,
24 we've got about 48 aging management programs that
25 we've credited in the license renewal application.

1 Each of those has been assigned a unique commitment
2 tracking number and the tracking item, which has a lot
3 of information included in it that people in the
4 future will have readily available to them and
5 includes information such as what are the aging
6 effects that are concerned, how do we monitor those,
7 how do we detect it, what are the inspection criteria,
8 so that the information that we use to develop our
9 aging management program reviews as part of the
10 application submitted to the NRC has been moved from
11 the license renewal documentation into these
12 commitment tracking items.
13 The actual aging management programs are
14 implemented through maintenance procedures, other
15 kinds of procedures, work requests, ongoing
16 surveillance programs. And as part of our process,
17 all of the steps in those procedures and surveillances
18 that constitute the commitment we've made to the NRC
19 are annotated with references to the commitment items,
20 maybe the entire procedure, maybe particular steps in
21 the procedure, so it's all documented there.
22 In slide 12, the project team is going to
23 have all those commitments in place by December of
24 this year, so before the project team dissolves itself
25 and goes away, they've completed all those commitments

1 and will be in the procedures.

2 CHAIRMAN BONACA: You mean the

3 implementation is going to be done by the end of the

4 year?

5 MR. POLASKI: No. The inspections won't

6 be done but --

7 CHAIRMAN BONACA: I understand that.

8 MR. POLASKI: -- but all of the procedures

9 will have been either revised or annotated to indicate

10 what are commitments. New procedures will be written

11 and put in place, or we will have commitments in place

12 to write those procedures in the future with the

13 information there. So the whole process will be set

14 up so that, when Rob and his team go off to other

15 jobs, they will all be there.

16 All supporting information will be

17 available to people, but they won't need to go to it.

18 It will be in the commitment process. So if somebody

19 wants to look at a maintenance work order,

20 preventative maintenance activity, and makes a

21 decision, "Do I defer this work, or do I not do it?"

22 will look at it and it will be a commitment, and it

23 will be annotated. It says, "This is a license renewal

24 commitment." They'll need to, by procedure, go back

25 and review the bases for that and go through the

1 change process to make that decision, "Do I do this or
2 not? Do I do this one-time inspection? Can I defer
3 it to later?" so it will be there to make sure that
4 they stay in that process.
5 CHAIRMAN BONACA: Yes. We have encouraged
6 other applicants before to implement commitments well
7 before we get to license renewal just because, you
8 know, the NRC will have a lot of this license renewal
9 application going to place by the same time.
10 MR. POLASKI: And in reality, if you look
11 at the programs that we've committed to do, Dr. Powers
12 was raising the question earlier about a lot of this
13 additional inspections we're going to do. We haven't
14 exactly quantified the number, but I believe it's
15 probably like 98 percent of all of the inspections,
16 we're going to do somewhere in that range, or already
17 things we're doing now. We may have enhanced them to
18 beef them up somewhat. There are very few new ones.
19 There are one-time inspections to confirm water
20 chemistry. There's a couple of new programs for cable
21 monitoring. But for the large part, most of what
22 we're doing, what we're committing to for license
23 renewal is already there.
24 So there will be new activities, but most
25 of those will be done when the equipment is taken out

1 of service for other reasons. So we're not like we're
2 going to be doing a whole lot of new things for
3 inspections or taking the equipment out of service
4 just for license renewal inspections.
5 And I guess the last point is we've got
6 all these in place. Region III performed their final
7 follow-up inspection and looked at a significant
8 number of our action tracking items and reviewed them
9 to make sure that all the information was in there,
10 and they agreed that we had everything we needed, and
11 all of them were satisfied with that.
12 So we believe we've got everything in
13 place to put this in place long-term. What we're
14 doing with Dresden is somewhat what we did on Peach
15 Bottom. It's just rolling from plant to plant.
16 MEMBER POWERS: I guess what I'm
17 struggling with a little bit here is how do you know
18 that this is going to be adequate? You know, some of
19 it I don't quite understand. I mean, a unique
20 tracking number doesn't really impress me. What does
21 impress me is this detailed information that you
22 provide, apparently, with each one of these items. Do
23 you have an example of that? I mean, did the
24 subcommittee have a chance to look at an example of
25 that?

1 MR. POLASKI: Yes. The subcommittee had
2 about eight pages of presentations.
3 MEMBER POWERS: Sure, sure.
4 MR. POLASKI: Bill wouldn't let me show
5 them again today.
6 MEMBER POWERS: Ah, come on, Bill. Good.
7 Because that impresses me. The unique tracking
8 number, you know . . .
9 MR. POLASKI: The write-up, when you put
10 up the description on aging management programs, it
11 can be several pages long with all the detailed
12 information that's in there, and that's all readily
13 available to people in the plant right through
14 passport computer system. They can go in and pull
15 that right up on the computer and look at all that
16 information.
17 MEMBER POWERS: And what you've said is
18 you've done this before with Peach Bottom, so you know
19 something about it. But still the question is how do
20 you know it works? How do you know that, despite all
21 this, that things can get dropped and forgotten?
22 MR. POLASKI: This is part of a program
23 that handles all of our commitments to the NRC. So
24 when we make commitments as a result of an LER or
25 response to generic correspondence, it goes into the

1 system, and it's monitored by people who are
2 responsible for the commitment tracking process to
3 make sure that we're actually implementing things. If
4 there's changes that need to be made, there are
5 procedural requirements about how you know you can go
6 ahead and do that. So I don't see these as any
7 different than any other commitments we make and that
8 we need to do. And the NRC is going to be inspecting
9 us. I mean, in the SER, there's a long list of
10 commitments we've made, and they'll be inspecting it
11 before we ever get to the period of extended
12 operation.
13 MR. BOHLKE: And we'll be looking at it
14 from an oversight standpoint internal to Exelon to
15 make sure that we're meeting our commitments. So
16 there's barriers that help us ensure that we're doing
17 what we --
18 MEMBER POWERS: I guess what I'm asking
19 for is what's the data on the system? Have you ever
20 forgotten a commitment to the NRC before?
21 MR. BOHLKE: Have we ever forgotten a
22 commitment to the NRC? In recent memory, no.
23 MR. GILLESPIE: Dana, how long do you
24 maintain a grudge?
25 MEMBER POWERS: Forever. I'm like an

1 elephant, I never forget.

2 MR. BOHLKE: Mr. Chairman, that concludes

3 our presentation. As usual, it's been interesting. We

4 think we've put together a very robust program for

5 these four units at the Dresden and Quad Cities

6 stations. We recognize that there have been some

7 interesting challenges posed here today, and we look

8 forward to the resolution of those. Thank you.

9 MEMBER ROSEN: I have one question. I'm

10 not sure it's to Commonwealth, Exelon, or the staff.

11 There were a number of questions requiring further

12 evaluation, a dozen of them as a matter of fact. When

13 will the answer to those be covered?

14 DR. KUO: Well, when T.J. Kim goes there.

15 If you have any questions on the information we

16 already sent to you, that's the time to ask the

17 question.

18 MEMBER ROSEN: Okay. I'll have a chance

19 later on with T.J.

20 CHAIRMAN BONACA: Okay. With that, let's

21 move then to Mr. Kim.

22 DR. KUO: When T.J. makes the

23 presentation, we will have the staff also discuss this

24 issue that we just had discussions.

25 MR. KIM: While we're getting set up, let

1 me go ahead and get started. My name is T.J. Kim,
2 and, Mr. Chairman and the members of the Committee,
3 I'm really honored to be here this morning to present
4 to you the conclusions over the Dresden and Quad
5 Cities license renewal application. A lot of the
6 stuff that's covered on the slide has already been
7 talked about during Exelon's presentation, so I don't
8 see anything new on here. The application was
9 submitted January 3rd, 2003, and it's a single
10 application covering both sites.
11 Let's go the next slide, please. The only
12 thing here that I want to mention, I guess, is
13 Dresden. You may have already noticed, but Dresden
14 and Quad Cities' application represents, I believe,
15 fifth application that's modeled after GALL process
16 following Fort Calhoun, Robinson, Ginna, and Summer
17 plants. Let's go to the next slide.
18 MEMBER LEITCH: On that first slide --
19 MR. KIM: Yes, sir.
20 MEMBER LEITCH: -- it appears to indicate
21 that the electrical generation at Dresden and Quad
22 Cities are significantly different with the same
23 thermal power rating. Why is that? Is that a mix-up?
24 MEMBER SHACK: The first slide.
25 MEMBER LEITCH: How come you have 120

1 megawatts' difference with the same thermal power?

2 MR. BOHLKE: I believe that's possibly

3 showing that the Quad Cities' units are currently

4 derated as --

5 MEMBER LEITCH: Oh, I understand. Okay.

6 So that represents the original 100-percent power at

7 Quad Cities?

8 MR. KIM: Yes. Quad Cities, both units

9 are limited to 85 percent of the operating power

10 level, so I believe those numbers are --

11 MEMBER LEITCH: Yes, that slide is not

12 quite clear. If you're using that for any other

13 purposes, I think you should clarify that bullet.

14 MR. KIM: All right. I'm on slide

15 number 4. This slide highlights all of the NRC audits

16 and inspection activities associated with Dresden and

17 Quad Cities license renewal application review.

18 Headquarters staff has conducted a scoping

19 and screening audit at the Exelon engineering

20 facilities, and Region III conducted an inspection of

21 scoping and screening, and then followed by the

22 headquarters staff conducting an audit of the aging

23 management program. And the purpose of that audit was

24 to compare the licensee's aging management program

25 against the GALL program to make sure those programs

1 are consistent.

2 And Region III conducted an aging

3 management review and an aging management program

4 inspection, one week at Dresden and one week at Quad

5 Cities. And the focus of those inspections were to

6 look at the implementation aspects of the proposed

7 aging management programs at both sites.

8 MEMBER KRESS: What's the difference

9 between an audit and an inspection?

10 MR. KIM: Okay. Audit -- we focused more

11 on the program description themselves. As I said

12 before, our purpose of the audit was to make sure the

13 proposed aging management program at Exelon is

14 consistent with the GALL aging management program,

15 which had already been accepted --

16 MEMBER KRESS: Right.

17 MR. KIM: -- by the staff. So that's the

18 audit.

19 The inspection focused more on the

20 implementation part, making sure the procedures are in

21 place, so that either the maintenance worker or an

22 engineer can -- you know, has enough detailed

23 instructions and procedures in hand to go and actually

24 implement the program.

25 MEMBER KRESS: Thank you.

1 MR. KIM: And then, Region III conducted
2 an optional third inspection to focus on the
3 commitment tracking system. And I believe Region III
4 has also conducted a follow-on inspection back in May
5 of this year.
6 By the way, Laura Kozak, who led the
7 Region III inspection, is -- she is on the phone tied
8 in by the telecon, if you have any questions on the
9 inspection aspects.
10 Let's go to the next slide, please.
11 Okay. This slide highlights the aging
12 management program audit activity, which I already
13 talked about. One thing I might mention is that three
14 aging management -- as a result of the audit, Exelon
15 enhanced three aging management programs to make those
16 more consistent with GALL. And those three aging
17 management programs are a selective leaching program,
18 a fire protection aging management program, and one-
19 time inspection program.
20 Let's go to the next slide.
21 MEMBER POWERS: Well, let me ask you a
22 question.
23 MR. KIM: Sure.
24 MEMBER POWERS: You concluded down there
25 that you found them acceptable. That doesn't tell me

1 a whole lot, but I'm going to assume that they covered
2 everything you could think of and so you found them
3 acceptable.
4 MR. KIM: Yes. Again, the focus of the
5 audit was to ensure Exelon's aging management programs
6 were consistent in all aspects.
7 MEMBER APOSTOLAKIS: With what? With
8 system --
9 MR. KIM: With all programs. You know,
10 those 10-element programs. So that's what we mean
11 when we say we found them acceptable.
12 MEMBER POWERS: That's kind of what you've
13 done in the past.
14 What I'm struggling with are two things.
15 One is: how do you know that's enough? Okay? And
16 the second one is: suppose the program is
17 incompletely implemented or executed? That is, it's
18 not everything. How do you know it's robust enough
19 that it still performs its function? In other words,
20 I'm asking you, what's the defense-in-depth and what's
21 the redundancy and diversity here in these programs?
22 MR. KIM: Let me see if I can --
23 MEMBER POWERS: And do you look for that
24 sort of stuff?
25 MR. KIM: Let me see if I can try to

1 answer that. Your first part of the question is: how
2 do we know the program is good enough? And I think
3 the answer is that the staff has already reviewed and
4 accepted aging management programs that are contained
5 in the GALL report. Okay?
6 So as long as the applicant's proposed
7 aging management programs are consistent with the GALL
8 program, then that gives the basis for the staff to
9 say, "Yes, these programs are acceptable" or managing
10 aging for license renewal. Period.
11 MEMBER POWERS: I mean, that's a
12 procedural base, then. I guess what I'm asking you is
13 an absolute thing. What leads you to the conclusion
14 that this program is adequate? And I think the answer
15 is nothing. You don't have a database that you can
16 compare program against results and say, "Yes, this
17 program works, and this other kind of program doesn't
18 work."
19 DR. KUO: Dr. Powers, if I may --
20 MEMBER POWERS: Sure.
21 DR. KUO: -- in reviewing the programs for
22 GALL, to include the GALL -- already include the GALL,
23 we review the program against the 10 elements there.
24 One of the elements in there is the operating
25 experience. We want to make sure that this program

1 works, just like you said, based on the operating
2 experience.
3 If there was something that happened
4 before, what actions they have taken, the corrective
5 actions they have taken, to make the program better,
6 or -- so they -- in this program that -- to address
7 the 10 elements, they have to address what the
8 operating experience has been with this program.
9 That's how we judge the --
10 MEMBER POWERS: Well, that must have been
11 a very interesting discussion in light of what we
12 opened this meeting with on the white findings where
13 we find things get -- not all things are done
14 especially well. I mean, how does that square up with
15 finding them acceptable?
16 DR. KUO: Well, I submit that there is
17 really no 100 percent perfect program. And we kind of
18 expect that from time to time the program may have
19 some flaws there. But earlier in this program
20 evaluation is another element which says corrective
21 action, and then commitment to control the -- and
22 achieve control of the program. Make sure that the
23 feedback -- that the experience gets fed back to the
24 program itself.
25 MEMBER POWERS: Okay. You're trying to

1 address the second part of my question.

2 MR. KIM: Dr. Powers, if I may add to what

3 Dr. Kuo was just talking about. As you are aware, the

4 GALL report was based on I believe almost 20 years of

5 -- 20 years worth of operating history for nuclear

6 reactors, both domestic and foreign. And we have a

7 program in place that is to update the GALL based on

8 more recent operating experience from all plants.

9 So GALL is -- by no means it's a one-time

10 deal. It's going to be a living document that's going

11 to be constantly updated and provide new information.

12 MEMBER POWERS: That's fine. But does

13 that, then, lead ipso facto to a change in all these

14 programs as you update the GALL? I think not.

15 MR. KIM: Well, then, what we have is an

16 ISG process where if they -- if new information comes

17 in that warrants additional requirements, then we have

18 interim step guidance process that allows us to look

19 at that and do a backfit analysis. And if the

20 cost/benefit turns out favorably, then we can require

21 licensees to adopt additional requirements in terms of

22 aging management program.

23 MEMBER POWERS: A process based on

24 historical evidence is, at best, slow.

25 MR. KIM: That I can't really --

1 MR. GILLESPIE: Dana, let me correct that
2 one point. Actually, the ISG process in Part 54 --
3 Part 54 has a paragraph in it which exempts new
4 information on aging management from backfit, but does
5 require every licensee to reevaluate the new
6 information in the context of its extended license.
7 So, in fact, backfit doesn't apply to the aging
8 management aspects of Part 54. It's specifically
9 excluded.
10 And we about six months ago, PT, maybe a
11 little longer, sent out some communications to the
12 industry to this effect. And it was the ISG on ISGs,
13 and how do you deal with plants like Calvert Cliffs,
14 etcetera, who have already been approved when you have
15 new information coming in? So we can get you a copy
16 of what we sent out. At the time, we had gone over it
17 with the committee.
18 So there is, you might say, a regulatory
19 process in place to get the new information out and
20 cause licensees to have to evaluate it.
21 Now, it's not perfect, because, you know,
22 then we have to follow up with inspections. Did they
23 carry out the requirement to evaluate it?
24 DR. KUO: And if you recall, we did make
25 that presentation to the committee on our IC process.

1 What Frank just mentioned was that if there's some new
2 information, there is a provision in the Part 54 rule
3 -- 54.37(b) -- that asks the renewed licensee -- I
4 mean, the licensees with a renewed licensed to look at
5 the new information and make an annual update to their
6 FSAR.
7 MEMBER POWERS: I'm glad you pointed that
8 out. I had completely forgotten that clause and --
9 DR. KUO: Yes. There is one provision
10 there.
11 MR. GILLESPIE: Licensees tried to, too,
12 but we -- we periodically have to review --
13 (Laughter.)
14 MEMBER POWERS: You have no idea how
15 impressed I am that you guys could pull this out of
16 the top of your head.
17 (Laughter.)
18 MR. GILLESPIE: We think about it a lot.
19 (Laughter.)
20 MEMBER POWERS: I shall be diligent and go
21 look myself.
22 (Laughter.)
23 MR. GILLESPIE: There is a good question,
24 and Mario asked it also. Power uprates and GALL and
25 extension are becoming more and more inexplicably

1 linked. And we are entering a new regime where I
2 think the collection of operating --
3 MEMBER POWERS: It's not inexplicably;
4 it's inextricably.
5 MR. GILLESPIE: Inextricably. But one
6 goes with the other, and whether they're before or
7 after, we do recognize that GALL is going to have to
8 evolve as we get new operating data in a new regime of
9 pressures, temperatures, and flows.
10 CHAIRMAN BONACA: Do you want to talk
11 about that now or --
12 MR. GILLESPIE: No, I was just going to
13 let you -- it's not forgotten, and I think when we
14 come back and review our next GALL update with you
15 we'll be ready to say how -- we've at least given some
16 thought that we do need to now consider that. And how
17 you collect the information is an interesting
18 quandary.
19 CHAIRMAN BONACA: Well, I mean, I think
20 what concerns me is that in the rule for license
21 renewal, you know, there is a very specific
22 requirement that operating experience be brought to
23 bear, and, in fact, there is a specific requirement
24 that you shouldn't apply for a license renewal
25 application before 20 years of experience have gone

1 by.

2 Now, the question is: how much do you
3 have to increase your power before you have a new
4 plant? That's really the resulting question. Now,
5 you know, these are big uprates, and we heard that
6 nothing matters. I mean, we've had questions -- the
7 possible connection between license renewal and power
8 uprates for years now, and we've been told that no
9 issue.

10 Then, we have the steam dryers. Now, the
11 steam dryers were never supposed to fall apart, fall
12 to pieces. That's why we never thought that there
13 would be a cascading effect, and that would possibly
14 become part of that group of license renewal that
15 says, "No safety-related data may affect the -- you
16 know, impact the safety-related systems." And yet it
17 happened.

18 As we look at that, then we have this
19 presentation that BWR Owners Group had done to you.
20 With this kind of information, I mean, this is -- a
21 lot of this information says there could be impact on
22 license renewal programs resulting from what we see
23 there. And, you know, yet we are approving now
24 license renewal without addressing the specifics in
25 the operating experience.

1 There are ways this could be done. You
2 know, one way could be that before they enter the
3 license renewal period, an applicant that has not had
4 experience at the extended power uprate, performs a
5 review of its operating experience and says, "Yes,
6 there is no impact on the programs I committed to."
7 Or, "Yes, there is a need for it, and now we have to
8 change Program X, Y, and Z." That's one possibility
9 to address it.
10 But, you know, with this kind of
11 information coming, I think this kind of information
12 begs for it to be considered in the applications.
13 DR. KUO: Well, I guess I would have to
14 say that, like Frank just mentioned, that, you know,
15 all these issues that you're talking about, yes, they
16 are real issues, and we are thinking about it. The
17 vehicle that we are going to discuss it is when we
18 have our guidance document updated. That's where we
19 collect all the operating information.
20 CHAIRMAN BONACA: Well, once you provide
21 an approval, I mean, what is the hook to go back to a
22 licensee and say, you know, "I mean, you have to look
23 at your commitments that you gave me three years ago
24 and make sure they still apply." You really have no
25 leverage, no hook, to do that.

1 DR. KUO: Yes. Yes. The provision I just
2 mentioned, 54.37(b). We could go back, ask them to
3 make an annual evaluation. If there is new
4 information, they have to check and make an
5 evaluation.
6 MR. KIM: And the ISG process that we
7 mentioned earlier.
8 CHAIRMAN BONACA: That's the one you
9 mention on slide number 8?
10 MR. KIM: Yes.
11 CHAIRMAN BONACA: Do you want to go to
12 that slide? Let's talk about that. Because it talks
13 about steam dryers, and it talks about this issue of
14 other mechanisms that we have not experienced.
15 MR. KIM: Yes. Let me start out by a
16 discussion that's, I want to say, at a 50,000-foot
17 level. As you mentioned earlier, Dr. Bonaca, there
18 has been a lot of recent operating experience -- steam
19 dryer issue being one of them -- associated with
20 extended power uprates. But as you know, EPUs are
21 fairly recent phenomena.
22 CHAIRMAN BONACA: Right.
23 MR. KIM: I think the first EPU that the
24 staff has approved was back in 2000. So both the
25 industry and the NRC staff have a relatively limited

1 amount of experience to date.

2 CHAIRMAN BONACA: Correct.

3 MR. KIM: And I'm sure you're well aware
4 the staff has really reinforced, if you will, our
5 operating experience gathering capabilities,
6 specifically to look at the experiences from extended
7 power uprates. And we're incorporating those
8 experience to reviewing future EPU applications or the
9 applications that are in-house right now -- Vermont
10 Yankee being one -- to make sure all of those lessons
11 learned are being addressed.

12 And we're also looking at the operating
13 experience from extended power uprates to see if there
14 is any aging components that can be -- that can affect
15 license renewal for long-term operation of the plants.
16 So we're also looking at that, too. So it's -- I
17 think it's best to describe its ongoing effort, and on
18 many of these issues the jury is still out.

19 So we're -- the staff is still evaluating
20 a lot of these issues, and we're working very -- the
21 staff is working very closely with the BWR Owners
22 Group and GE to address these issues. And when we
23 finalize our reviews on these issues, a number of
24 things can result. One we already talked about.

25 We can -- especially in the license

1 renewal space, we can look at the ISG, use the ISG
2 process to see if we can -- if we need to require
3 additional -- impose additional requirements to the
4 applicants who have already received renewed licenses,
5 or invoke 54.37(b) clause, as PT mentioned earlier, to
6 have the licensees come up with additional aging
7 management programs to address new aging effects that
8 hadn't been reviewed before.
9 CHAIRMAN BONACA: I understand. Now,
10 let's talk about the steam dryers.
11 MR. KIM: Okay.
12 CHAIRMAN BONACA: I don't know from these
13 slides where you're going with that, you know. We --
14 at least I have -- and Mr. Leitch proposed that the --
15 MR. KIM: At the moment, the staff has
16 concluded that the steam dryer issue in particular
17 should be best handled as a current operating issue.
18 And we're closely monitoring Exelon's activities. As
19 they mentioned, they are planning to --
20 CHAIRMAN BONACA: But isn't it true that
21 this is a passive component?
22 MR. KIM: Yes, it is a passive component.
23 CHAIRMAN BONACA: Isn't this also a long-
24 lived component?
25 MR. KIM: Yes, it is.

1 CHAIRMAN BONACA: And we have experience
2 from it that pieces of it went through safety-related
3 equipment. So, therefore, it could have an impact on
4 safety-related components.
5 MR. KIM: Right now it's just --
6 CHAIRMAN BONACA: It's a component whose
7 failure could have an impact on safety-related
8 components. So it fits up to a tee the definition of
9 what is in the scope of license renewal.
10 MR. KIM: We may defer on that point. PT,
11 do you want to address some --
12 DR. KUO: If I may. For this issue,
13 actually, the staff considers this is really an
14 operating issue, and this is also a generic issue,
15 which was Dr. Powers' observation before. So staff is
16 evaluating the issue right now.
17 As a matter of fact, recently they made a
18 trip to GE to look at it -- this type of thing. So as
19 soon as we complete this review, I would expect -- and
20 I actually can -- can commit the staff to it, to come
21 to the ACRS Committee and make a presentation to you
22 all.
23 CHAIRMAN BONACA: Okay. Now, assume that
24 you agree with us, just to make an example, and you
25 decided to ask the licensee to put it in scope of

1 license renewal. Okay? You will have leverage now,
2 because you haven't given the license renewal yet. So
3 you have come to an agreement with that.
4 Now, let me ask you: if this didn't
5 happen then, and you have to rely on 10 CFR 54.37(b)
6 to do that, what leverage would you have? You could
7 say --
8 DR. KUO: Well, in the SER -- in the SER
9 for this particular issue --
10 CHAIRMAN BONACA: Now I'm talking about
11 all the other issues that may come up. I'm saying,
12 what leverage does 54.37(b) provide you with to -- if
13 the licensee disagrees with you? If you contend that
14 some item is -- should be in license renewal and
15 they're saying, "No, it shouldn't be. So, therefore,
16 I'm not updating my FSAR." You have no leverage to do
17 that.
18 MR. GILLESPIE: The burden then becomes a
19 compliance issue with the staff, and then they're
20 found in non-compliance for inadequately considering
21 the information, and we go through the normal ROP
22 process.
23 DR. KUO: Yes.
24 MR. GILLESPIE: Now, the burden is on the
25 staff to make the judgment that what they're doing is

1 inadequate based on the staff's judgment of what
2 should be done. So there's a shift in burden clearly.
3 It's --
4 DR. KUO: In terms of meeting the Part 54
5 rule, okay, this is going to be a non-compliance
6 issue, and we can use 54.37(b) as the licensee with
7 renewed license to -- to do the review.
8 MEMBER ROSEN: Have we ever had a non-
9 compliance issue like that, Frank?
10 MR. GILLESPIE: No. We've never had a
11 citation against Part -- a compliance issue against
12 Part 54. You know, I have to say, I mean, we can
13 postulate that we get at odds like that, but I think
14 the resolution to the dryer issue, or if there's
15 another significant flow issue that comes up, will be
16 done the way we've done other issues.
17 And I can't picture one licensee, if we do
18 it back and forth with the industry as we generally do
19 for generic issues, one licensee being an outlier is
20 highly unlikely. But we do have the compliance
21 vehicle if we need it.
22 I think that, Mario, the bigger question
23 is -- this is an interesting one -- is if you get a
24 power uprate after you have a renewed license, the
25 power uprate piece has to address the aging management

1 parts of this. And if you get the power uprate before
2 you get the renewed license, you're actually only
3 reviewed for your original 40-year term. And then we
4 would have to catch it here.
5 So this actually impacts some plants that
6 we've already given renewed licenses to. The power --
7 the staff now has to review to a slightly different
8 history, and I don't think our review guideline
9 actually addresses 60 years of operation for power
10 uprates. It's generally a 40-year guideline.
11 MEMBER POWERS: Let me ask you a question.
12 And it's going to be based on memory, and I've already
13 demonstrated my memory is faulty, since I didn't
14 remember 54.37(b).
15 (Laughter.)
16 Feel free to correct my failing memory.
17 My memory and the extended uprate for these plants was
18 Dr. Ford interrogating people at length about possible
19 damage to the steam dryers, and what not, and that he
20 was assured, in no uncertain terms, that an extensive
21 and comprehensive analysis had been taken and that
22 everything was fine.
23 Now we are presented with a discussion of
24 the dryers that subsequently failed, and, say, an
25 extensive and obviously very detailed analysis with

1 scale models and what not are being done to design
2 dryers that will stand up to this formidable flow
3 that's necessary for the power uprate. And that the
4 staff will have a chance to examine those, just as
5 they had examined the previous thorough and
6 comprehensive analysis of the steam dryers.
7 What is it that the staff does when
8 they're presented with these what will obviously be an
9 extremely complicated and extremely detailed analysis
10 on the design of the dryers? What do you -- at what
11 point do you say, "This is so detailed I'm going to
12 have to get help to look at this."
13 MR. GILLESPIE: Yes. I'd like to be able
14 to look at the audience and look for the person who
15 could answer that question, because I can't. But
16 honestly, our program is very dependent upon the
17 findings on topical reports, and so the best I can do
18 is probably promise that we'll get with the
19 appropriate people and come back and chat with --
20 MEMBER POWERS: Yes. I mean, this
21 obviously has implications far beyond this.
22 MR. GILLESPIE: Oh, yes, it does.
23 MEMBER POWERS: I'm trying to --
24 MR. GILLESPIE: This is beyond steam -- as
25 I said, we're in a new flow regime, temperatures,

1 pressures that we --

2 CHAIRMAN BONACA: By all means.

3 MR. GILLESPIE: -- steam systems. I mean,

4 the Japanese incident says even condensate systems can

5 pose a problem.

6 CHAIRMAN BONACA: And the --

7 MEMBER POWERS: Not earthshaking news, but

8 dramatically demonstrated.

9 MR. GILLESPIE: Dramatically demonstrated.

10 (Laughter.)

11 So I can only say that we're going to have

12 to -- we'd have to bring the right technical staff who

13 is responsible for the topical reports.

14 MEMBER POWERS: Well, understand what the

15 question is. I mean --

16 MR. GILLESPIE: It's a fair question.

17 MEMBER POWERS: You have a choice. You

18 can review what's presented to you, or you can go

19 through and independently analyze. And clearly, when

20 things get very complicated, you've got to make a

21 decision between those two. I'm trying to understand

22 how you make that decision.

23 MR. GILLESPIE: And I would have to agree.

24 When I heard Exelon's explanation of the acoustic

25 coupling and the instrumentation, I'm out of my realm

1 of background. It's a lot of readings, and it
2 certainly sounds more detailed than we had before.
3 MEMBER POWERS: Which was thorough and
4 comprehensive, but it --
5 (Laughter.)
6 MR. GILLESPIE: I can only commit that
7 we'll get with the staff and get on the ACRS schedule,
8 and come back and potentially address steam dryers and
9 where we're at. And then we have to think about --
10 this raises a different regime.
11 CHAIRMAN BONACA: Let me ask a question,
12 though. Okay. You have new information that is
13 forming. This is the first time we are confronted
14 with this information from the BWR Owners Group.
15 Now, I would say in a few years we'll know
16 pretty well what to expect, and that the effect will
17 be already reflected in GALL. Right now we don't.
18 You know, now, the first plant from Exelon that goes
19 into license renewal is going to be probably eight
20 years from now, eight/nine years from now.
21 MR. KIM: Actually, six years or something
22 like that.
23 CHAIRMAN BONACA: Six years?
24 MR. KIM: Yes.
25 CHAIRMAN BONACA: What if -- what would be

1 wrong, say, you know, a year before getting into
2 license renewal for that plant? They would review
3 their operating experience and perform an evaluation
4 -- a simple evaluation that says we have looked at
5 them, and we should change these two programs and the
6 rest is okay, and you would review that. You know,
7 will it be a better way to address this issue of
8 operating experience that is not really right now
9 reflected in the application?
10 DR. KUO: Well, if I may, like I said
11 before, when I came to this meeting I talked to Gene
12 Imbro, who is the Branch Chief for the Mechanical and
13 Structural Engineering Branch. And what he had told
14 me was that the staff is reviewing it. And we
15 recently made a visit to GE, and we will do a
16 comprehensive review. As soon as we complete it,
17 we'll go to the committee and make a report to the
18 committee. So right now we really don't have a whole
19 lot of information.
20 CHAIRMAN BONACA: Okay.
21 DR. KUO: For license renewal, in our SER
22 we actually had to -- the applicant made a commitment.
23 The commitment reads that if -- if plans to maintain
24 the integrity of the Dresden and Quad Cities steam
25 dryers during extended power uprate conditions should

1 be unsuccessful, the applicant has committed to
2 include the dryers within the scope of license
3 renewal.
4 CHAIRMAN BONACA: Well, that's only the
5 dryers, and I'm saying there is a lot of other stuff
6 now, many other components that have shown to fail, be
7 impacted. It's a different experience. And, you
8 know, here we have it in front of us, and we have to
9 do something about that.
10 Okay. Let's --
11 VICE CHAIRMAN WALLIS: Can I put my oar in
12 here? My colleague was asking --
13 CHAIRMAN BONACA: Please.
14 VICE CHAIRMAN WALLIS: -- about this
15 complicated, thorough analysis that's going to be
16 done. He was asking how the staff assures that it's
17 being done right. Let us not have a situation where
18 it comes to the ACRS, and the ACRS finds out it's not
19 being done right, and it is passed through all your
20 filters. Let us not run into that situation that we
21 have sometimes seen.
22 CHAIRMAN BONACA: Why don't we just move
23 on and --
24 MR. KIM: Okay. I'm on slide number 9 --
25 slide number 10, rather.

1 MEMBER SIEBER: Moving right along.

2 DR. KUO: T.J.?

3 MR. KIM: Yes.

4 DR. KUO: Before you get into that, can I

5 have a staff member who is here to answer the question

6 -- the previous question on the core shroud?

7 MR. KIM: Oh, sure. Sure.

8 DR. KUO: So that, you know --

9 MR. ELLIOT: Barry Elliot, Materials and

10 Chemical Engineering Branch.

11 The issues raised up during the previous

12 discussion was about the core shroud repair, and how

13 do we ensure its integrity.. The two issues raised I

14 thought were the intergranular stress corrosion

15 cracking and irradiation-assisted stress corrosion

16 cracking.

17 With respect to the intergranular stress

18 corrosion cracking, the materials we have chosen are

19 not susceptible -- not significantly susceptible. The

20 INCONEL 750 is heat-treated to produce microstructure.

21 That would not make them susceptible to our IGSCC

22 XM-19 stainless steel solution-annealed and low carbon

23 content, and that's used on the tie rods.

24 And then the 316L is the stainless steel,

25 has a maximum carbon content of .02 percent for the

1 remainder of the assembly. There are no welds on this
2 structure, so I don't think it would be susceptible to
3 IGSCC, and that's how we drew that conclusion.
4 With respect to the IASCC issue,
5 austenitic stainless steel, we've been using a
6 screening criteria on the order of 5 times 10^{20}. I
7 read the SERs. They don't talk about it. But I would
8 think that that's what -- when they made the
9 conclusion that it wouldn't be susceptible to this
10 mechanism that that's what they had in mind.
11 With respect to that, we also do
12 inspection. The hardware -- this hardware is --
13 inspection criteria is contained in BWRVIP-76, and it
14 requires two different types of inspections -- first,
15 a general VT-3 according to the ASME code, and then a
16 more -- what's called a detailed inspection. This
17 would encompass looking for gaps and things that could
18 cause a problem with the materials and the structural
19 integrity of the component.
20 At the time we wrote the original SER for
21 this it was way back in the late '90s. A lot of time
22 has progressed since then. We are still reviewing --
23 we haven't finished reviewing the BWRVIP-76 yet. What
24 should be included as far as a detailed review is up
25 to -- at this point has been left to the designer of

1 the repair.

2 The staff is going to look into that.

3 We've had enough experience now. The designers have

4 had enough experience, so that we can get a more

5 descriptive program. And we think a detailed

6 examination should be capable of detecting cracks in

7 the tie rod. And that's our -- what we plan to --

8 assure that there's no IASCC problem.

9 Any other questions?

10 MEMBER FORD: The trouble is that this is

11 sort of a complicated subject. Everything you've said

12 as far as the IGSCC is correct. As far as the fluence

13 limit, the 5 times 10^{20} fluence limit is a moveable

14 feast. It can change depending on the other

15 parameters in the system. It's a criteria that has

16 been laid down for a long time and has been proven/

17 disproven many times, depending on what the other

18 conditions are in the system. So it's not necessarily

19 an absolute.

20 My comments about the VIP-76 -- it's my

21 understanding that the scope of that inspection is

22 very limited in both volume, degree of accessibility,

23 and after the first cycle is far too soon to be seeing

24 any irradiation-assisted cracking. And the next one,

25 as I understand it, is 10 years out, which is

1 potentially far too long away.

2 So what assurance do we have that nothing

3 is going to happen in those intervening nine years?

4 And what's the consequence if you do find cracking?

5 Because you are not inspecting horizontal core shrouds

6 in the meantime. Are they going to continue to crack?

7 So if the tie rod does fail in that

8 intervening nine years, what's the consequence if the

9 cracks in the underlying core shroud have propagated

10 and you haven't noted it?

11 MR. ELLIOT: Well, we don't inspect the

12 horizontal welds in the core shroud, because the

13 repair fixture takes the place of those welds.

14 MEMBER FORD: Yes. But what happens --

15 MR. ELLIOT: And then we are -- our intent

16 is to ensure the integrity of that structure by doing

17 the inspections. And we've lived with a 10-year

18 cycle, and it's been very successful for the industry.

19 MEMBER FORD: Oh, gosh.

20 MR. ELLIOT: And that's what we've been

21 using, and that's what we've been doing. That's our

22 experience.

23 MEMBER FORD: If we were going to do all

24 our life management in terms of what has happened in

25 the plants, we'd be in deep, deep trouble.

1 MR. ELLIOT: Let me just say this -- that
2 if we see something different, of course we would
3 change the frequency of inspection. We saw that same
4 thing with IGSCC in the past, and we changed the
5 frequency of inspection there in the VIP -- I think it
6 was 74. If the same thing happens here, we will
7 probably change the frequency of inspection. Again,
8 we need some kind of experience to make this change.
9 MEMBER FORD: I don't have a problem with
10 what you're saying, except that in the last five, 10
11 years, we have been embarrassed by a seemingly
12 continual series of materials degradation issues. And
13 they have all been superseded by the statement, "It
14 will never occur" or "it has never occurred." And
15 then, dammit, it occurs, and then we are all
16 embarrassed. And I don't want to go through this
17 again, this embarrassment.
18 And I'm not hearing any difference in your
19 -- in the way you are tackling this. It essentially
20 is prefaced by, "It has never occurred" or using
21 arguments along those lines. And I just feel very
22 uncomfortable about it.
23 What would be the consequence if you had
24 a failure of a tie rod because you have not inspected
25 it in a timely manner, i.e. not within nine years, it

1 fails, you haven't been inspecting the horizontal core
2 shrouds, which can be cracked all the way around to
3 midsection, what would the consequence be?
4 MEMBER SHACK: If it's only to midsection,
5 nothing.
6 MEMBER FORD: No? The only thing about
7 the midsection is that you're constrained by the
8 residual stress profiles. But what happens if the
9 residual stress profiles are not what you expected?
10 Which has occurred.
11 VICE CHAIRMAN WALLIS: Are you asking if
12 it could fall off? Are you asking something --
13 MEMBER FORD: No. I'm suggesting that
14 maybe there's an accident, you have shear stress, and
15 you could just shear the whole core shroud in half.
16 VICE CHAIRMAN WALLIS: Then it falls off.
17 MEMBER FORD: Well, it wouldn't fall off.
18 It would go shear to one side and --
19 VICE CHAIRMAN WALLIS: Yes.
20 MEMBER FORD: -- the control rods. It's
21 that sort of thinking I'm asking someone to address.
22 And I haven't -- in all of the license renewals, it's
23 not just Quad Cities, in all of the license renewals
24 when I ask that question everybody says, "Oh, a new
25 problem." And they cite some EPRI document that says

1 that the core damage frequency change is negligible.
2 I just don't believe it.
3 And even if that were true, the public
4 confidence, or lack of it, would be astounding. I
5 don't see that being addressed. It's those issues
6 that I'm sensitive to.
7 And the Exelon -- I mean, do you agree
8 with everything that's said on the Exelon sheet? You
9 don't agree? You saw it up on the screen there. I
10 mean, you could go down it, and you could question
11 every one of those bullets. And I'm assuming that the
12 staff have questioned every one of those bullets.
13 MR. ELLIOT: We've written SERs for -- on
14 all four units for this repair hardware.
15 MEMBER FORD: So, in other words, you --
16 MR. ELLIOT: And we agree with everything
17 that is on this, because this says that -- that's what
18 our SER says. And we reviewed in detail the
19 structural analysis that was made for the component,
20 the aging effects for the component, and we've
21 concluded that considering that it -- I mean, the
22 design, how it's designed and how it's -- the aging
23 effects, which are fatigue and irradiation, that this
24 thing could last for 40 years.
25 MEMBER FORD: Barry, I can think of at

1 least two people around this table who disagree with
2 many of those bullets. And I can think of 20 people
3 in the world who disagree with those bullets. And
4 that's my problem. We don't have resolution of these
5 factors.
6 And what I'm unclear about is: what's our
7 consequence if these things fail? And I haven't heard
8 anyone address that issue. If it's of no consequence,
9 fine, it's an academic debate, which some from Exelon
10 have said. You could go on arguing about this
11 forever. But I haven't heard anyone tell me that it
12 is of no consequence if one of these tie rods fail.
13 MEMBER FORD: Barry, I --
14 MR. GILLESPIE: Yes. I think the people
15 -- we don't have the systems and the risk people here
16 who talk to consequences. So our silence doesn't mean
17 we're saying there is great consequence, so don't
18 misinterpret the silence.
19 But, again, you're -- as with the dryers,
20 you're challenging some findings that were made in
21 SERs and topical reports and things that we don't have
22 the complete staff here to talk about that, that
23 basically the renewal process, in essence, has
24 accepted and not really questioned the previous staff
25 findings on these things.

1 But again, Mario, it almost sounds like
2 that -- I don't know how long it has been since the
3 staff has come over and talked about material issues
4 in general. But, I mean, this is number two. This is
5 the second big question that has come up, even just
6 this morning, on the same kinds of things.
7 CHAIRMAN BONACA: No, there's a difference
8 there. I mean, clearly in the license renewal you
9 rely a lot on evaluations that have been done before.
10 So I think that Dr. Ford is opening a question of the
11 adequacy of the evaluation that was done once, and
12 that's an issue that could apply to many other issues.
13 MR. GILLESPIE: That's what I'm saying,
14 yes. Is that a different presentation that we need
15 to --
16 CHAIRMAN BONACA: Steam dryers, you know,
17 were not supposed to fail. They failed, they fell
18 into pieces, the pieces went through safety-related
19 equipment, they are not -- some of them are not being
20 found. So, therefore, this is an operating history
21 that -- and the question is: should it be in license
22 renewal or not? That's really the very clear question
23 on that.
24 MR. GILLESPIE: Yes. So, I mean,
25 essentially we've already committed we come with the

1 details on the steam dryers and the reexamination that
2 is currently going on. We have to give people time to
3 digest the information and come back. We'll schedule
4 that.
5 But do we need a more integrated
6 discussion about materials issues like this also? If
7 the ACRS would like it, just ask.
8 MEMBER FORD: I would like it.
9 CHAIRMAN BONACA: I think you should
10 handle it under the materials --
11 MR. GILLESPIE: Under the subcommittee?
12 CHAIRMAN BONACA: Under the subcommittee.
13 That's who should be looking at it.
14 MR. GILLESPIE: And we'll be happy to --
15 it's just that I don't -- we don't have the staff here
16 to go through each of these separate staff reviews
17 that we've accepted.
18 CHAIRMAN BONACA: No, I understand.
19 MR. GILLESPIE: Appreciate that.
20 CHAIRMAN BONACA: All right.
21 MR. KIM: Okay. Let's go to slide
22 number 9. I think we skipped it.
23 Okay. One of the open items in the draft
24 SER that we discussed during the subcommittee meeting
25 that was still open at the time was this issue. And

1 this issue here is that the applicant had initially
2 proposed an inspection scheme for Class MC supports
3 and piping supports that is less rigorous than what's
4 required by the ASME Section 11, as prescribed in the
5 GALL report. And --
6 VICE CHAIRMAN WALLIS: Does IWF mean
7 anything?
8 MR. KIM: That's a sub --
9 VICE CHAIRMAN WALLIS: It's just a
10 subsection?
11 MR. KIM: It's a subsection that addresses
12 Class MC supports.
13 VICE CHAIRMAN WALLIS: So it doesn't mean
14 anything.
15 MEMBER ROSEN: No, it's not an acronym.
16 VICE CHAIRMAN WALLIS: Okay.
17 MR. KIM: And the bottom line here is that
18 we -- the staff was able to close this open item based
19 on the licensee's commitment to --
20 MEMBER ROSEN: Now, this is where I had my
21 question on the 12 subsequent questions. Number 12 of
22 those 12 questions was a question about structural
23 monitoring program, and the question of whether the
24 structural monitoring program to inspect the metal
25 containment supports would include pipes that

1 penetrate the containment. Was that issue resolved as
2 part of this?
3 MR. KIM: Yes. That's what we're trying
4 to say here. That issue --
5 MEMBER ROSEN: See, none of that wording
6 is incorporated. You talk about MC supports and MC
7 piping supports. But you never talk about pipes that
8 penetrate containment. So I -- and I'm still stuck
9 with this number 12, which says in the package we
10 received just prior to the meeting that the staff is
11 still discussing with the applicant the resolution of
12 this open item.
13 DR. KUO: Let me ask the tech staff. I
14 know that we have addressed that question, because we
15 had discussed that.
16 MR. ASHAR: I am Hans Ashar with
17 Mechanical Engineering Branch.
18 MEMBER ROSEN: Pull the microphone down.
19 MR. ASHAR: Okay. Subsection IWF includes
20 the inspection of all the Class I, Class II,
21 Class III, and MC components, except the Class MC
22 piping.
23 Now, Class MC piping is something that you
24 would refer to, is the one which is directly passing
25 through containment without any penetrations,

1 penetration sleeve around it. And they are generally
2 of a lower significance, safety significance, because
3 otherwise there will be a penetration around it,
4 sleeve around it.
5 So they are being inspected under
6 structural monitoring program in most of the things
7 that I have seen. They are not being included in
8 subsection IWF. So they are inspected under
9 structural monitoring program, and they are -- here is
10 what Exelon proposed in this particular area -- that
11 they will be looking at the supports under structural
12 monitoring program, and they will have a coolant type
13 of a sampling frequency of inspection program.
14 MEMBER ROSEN: I'm confident that if the
15 pipes that penetrate components without penetration
16 sleeve -- pardon me. I'm confident that those
17 components that are covered by IWF will be properly
18 inspected by the licensee.
19 MR. ASHAR: Correct.
20 MEMBER ROSEN: What I'm worried about is
21 the piping that is not covered by IWF, and I don't
22 hear you saying that that's going to be included in
23 the inspection program, nor did the licensee mention
24 it. And we have an open item on that, and it was
25 still open as recently as two weeks ago when we

1 received the final package to look at.

2 MR. ASHAR: Well, in the open item, it was

3 mainly focused toward the Class MC piping supports.

4 MEMBER ROSEN: Yes.

5 MR. ASHAR: Not piping themselves but

6 piping supports.

7 MEMBER ROSEN: Right.

8 MR. ASHAR: Okay. And they didn't result

9 in this particular item. They committed to do --

10 under structures monitoring program, they will be

11 doing the sampling size frequency, etcetera -- to what

12 they are using prior to --

13 MEMBER ROSEN: Do you understand you're

14 telling me something I already know?

15 MR. ASHAR: Yes, right.

16 MEMBER ROSEN: What I'm asking about is

17 what I don't know about.

18 MR. ASHAR: Yes. And that's what I said.

19 The MC piping is not -- let me tell you, in the

20 working group on containment, which addressed this IWE

21 and IWL, it is part of MC component. IWE is an MC

22 component, really. Okay? And then we just discussed

23 in last meeting, which was in New Orleans recently, we

24 discussed about including the piping -- MC piping into

25 the core itself. It's not in the core right now.

1 That's why it is being inspected under the
2 structures monitoring program. You are quite right,
3 it is not being addressed here, and that is a separate
4 question. But it is being -- I want the applicant to
5 confirm this for me, whether MC piping penetrating
6 through the containment will be inspected in a
7 structures monitoring program.
8 MR. STACHNIAK: This is Rob Stachniak.
9 The piping that penetrates the primary containment has
10 been and is in our code inspection program. Has been
11 and remains. The pipe supports on that piping were
12 not required per 10 CFR 50.55(a) to be inspected.
13 They were, however, included in our structures
14 monitoring program.
15 As we had agreed with the staff, we will
16 now change the requirements in our structures
17 monitoring program for the MC piping supports and
18 perform inspections per code on those supports.
19 MEMBER ROSEN: So the piping -- you
20 started off by saying is the piping has already -- is
21 already included in the --
22 MR. STACHNIAK: Correct.
23 MEMBER ROSEN: -- monitoring program. So
24 this is an open issue.
25 MR. STACHNIAK: Yes.

1 MR. ASHAR: I stand corrected myself.

2 MEMBER ROSEN: So this open issue has, in

3 fact, been closed.

4 MR. STACHNIAK: Yes.

5 MEMBER ROSEN: Okay. That's all I wanted

6 to know. Thank you.

7 MR. KIM: Okay. Moving on to the next

8 slide. The groundwater sampling results indicate that

9 the below grade environment is pretty benign at both

10 sites at -- you know, at Dresden and Quad Cities.

11 Therefore, a plant-specific program is now required

12 per GALL, and a structure monitoring program -- if the

13 licensee is going to use structural monitoring program

14 to do a periodic inspection of groundwater water

15 chemistry sampling to make sure the water chemistry

16 below grade remains benign throughout the extended

17 period.

18 MEMBER POWERS: Is it true the GALL report

19 still refuses to acknowledge potential degradation

20 from phosphates?

21 MR. KIM: Right now, yes, but that's one

22 area I believe the staff is looking at.

23 MEMBER POWERS: And I presume that the

24 staff -- that the licensee will not, in his

25 groundwater sampling, look for anything he's not

1 required to look for.

2 DR. KUO: Dr. Powers, I think the simple

3 answer is yes, GALL is still our standard for

4 reviewing concrete phosphate. But the question that

5 you brought before, I believe previously we had a

6 presentation to the committee from our research staff

7 that this is being done in -- looked at as a research

8 program. So as soon as we have any results from their

9 research program, we will come back to the committee.

10 MEMBER POWERS: Well, I'll say the same

11 thing I said to the staff. It doesn't take a research

12 program; it takes looking at the literature that's

13 already available. I mean, phosphate compound

14 formation is not new science.

15 MR. KIM: Okay. Next slide, please.

16 Appendix G of 10 CFR 50 requires the

17 reactor vessel beltline material have -- use Charpy

18 upper shelf energy values throughout the life of the

19 vessel, no less than 50 foot-pounds throughout the

20 extended operating period. And this chart lays out

21 for each unit what the values are.

22 And there was a question from the

23 subcommittee meeting about the value of 34 foot-pounds

24 for Quad Cities Unit 2, whether that was an outlier or

25 how the staff and the licensee was treating that. And

1 the licensee subsequently completed a plant-specific
2 equivalent margin analysis, and they came up with a
3 minimum upper shelf energy value based on that sample
4 of 32.4 foot-pounds, which obviously is less than 34.
5 So that's acceptable by Appendix G of 10 CFR 50.
6 Okay. Going to the next slide, again,
7 during the subcommittee meeting a question came up
8 relative to that outlier on the capsule upper shelf
9 energy value for Quad Cities Unit 2. One of the
10 subcommittee members -- I believe it was Dr. Rosen who
11 had asked for the entire set of sample values, so --
12 CHAIRMAN BONACA: Yes, they are.
13 MR. KIM: -- it's provided here and on the
14 next page.
15 So when we came to you back in April with
16 the draft safety evaluation report, we had five open
17 items and 16 confirmatory items. And all of those
18 open and confirmatory items have been closed, as
19 reflected in the final safety evaluation report that
20 was provided to you several weeks ago. And the staff
21 concluded, based on audits, table-top reviews, and
22 inspections, that licensee's application, which
23 addresses aging management programs at both Dresden
24 and Quad Cities, meet requirements of Part 54.
25 And separately we have also looked at the

1 environmental impacts, or potential environmental
2 impacts I should say, associated with license renewal
3 per Part 51 requirements. And all those requirements
4 have been satisfied.
5 So that concludes our presentation on
6 this. Are there any questions?
7 CHAIRMAN BONACA: Any additional questions
8 from members?
9 MEMBER SHACK: Yes. Now that we have all
10 of this data on the welds, what's different about this
11 electroslide weld? Has it got a particularly high
12 copper content relative to the others?
13 MR. ELLIOT: Can you put up the slide on
14 upper shelf use, the weld -- it's only one data point,
15 but it fits --
16 MEMBER SIEBER: Could you use the
17 microphone, please?
18 MR. ELLIOT: If you look at it
19 statistically, they are all part of one database.
20 It's -- you know, it's not that 95 percent confidence
21 value of 34, but it's close to that lower bound value.
22 So --
23 MEMBER SHACK: It's just a statistical --
24 MR. ELLIOT: You know, you get a certain
25 amount of data, you're going to find one that's near

1 the 95 percent lower confidence value.

2 MEMBER SHACK: It has a pretty high

3 copper. It's like --

4 MR. ELLIOT: It has high copper, but there

5 are plenty of welds with this copper. We haven't seen

6 anything like 34 before, so I think this is really a

7 statistical -- you know, if you get enough data,

8 you're going to find one of them is low.

9 CHAIRMAN BONACA: Okay. Any other

10 questions? If not, I thank the staff and Exelon for

11 their presentations. They were very informative.

12 We're going to take a break until 10:55.

13 (Whereupon, the proceedings in the

14 foregoing matter went off the record at

15 10:36 a.m. and went back on the record at

16 10:56 a.m.)

17 CHAIRMAN BONACA: Okay. We are back in

18 session.

19 We have now a proposed change to the

20 license renewal program, and so I'll turn to Mr. Kuo.

21 DR. KUO: Yeah. This is the second part

22 of our presentation today. The subject is really our

23 self-assessment, our review process for scoping and

24 screening. But before Jimi Yerokun, who is the

25 presenter -- and by the way, let me say a few words

1 about Jimi.

2 Jimi used to be in NRR when he did this

3 work, but since then, he was --

4 MEMBER ROSEN: I thought that looked like

5 Frank Gillespie.

6 (Laughter.)

7 DR. KUO: He was promoted to be a section

8 chief in our research office, but, again, he has

9 gracefully agreed to come back to make this

10 presentation. But before he makes his presentation,

11 Frank Gillespie has something to say in the bigger

12 picture for license renewal.

13 MR. GILLESPIE: Yeah, fortunately I had

14 asked for two slides and they only gave me one. But

15 I just want to put this in context.

16 MEMBER POWERS: Does that speak to your

17 effectiveness generally?

18 MR. GILLESPIE: Well, Sam said we weren't

19 allowed to have too many slides anyway. So actually

20 it worked out very well.

21 MEMBER ROSEN: We have to make up the

22 schedule. If you hit 500 in the major leagues, you're

23 pretty good.

24 MR. GILLESPIE: You're pretty good.

25 I'm just going to say the slide that's up

1 behind me is kind of an historic and future
2 perspective of license renewal, and actually what
3 we've done is taken on the end the potential for
4 second renewals with some kind of simplifying
5 assumptions that people will come in at the 43rd year
6 for the second renewal if they want it.
7 I'm putting this up because what I want to
8 do is point out this is when we expect to issue the
9 licenses, not when we expect to get them in. You can
10 see that somewhere around right now we've got about 40
11 percent of all of the sites, and this is done by site
12 because that's how the applications come in. About 40
13 percent of all of the sites that have been done are in
14 house, which means any improvements we make in the
15 program can't affect what's been done and can't affect
16 what's already here and, in fact, will have minimal
17 impact on those applications that are already ready to
18 come in in the next six to eight months.
19 So about half of the industry basically
20 will not be impacted by any improvements and half
21 will, which means what Jimi is going to talk about is
22 one of a number of reviews that we did as a major
23 midpoint correction in this whole program.
24 And I think you can also see that the
25 program runs until about 2012, and then all of a

1 sudden we kind of seem to drop off a cliff and go down
2 to about two or three a year, and if we don't get the
3 light blue color coming in, then we'll probably have
4 a different organizational arrangement to deal with
5 the residue.
6 A couple of things. There was scoping and
7 screening we've talked to the committee about before,
8 which is the review Jimi is going to talk about. It
9 also touches upon the interface a little bit with the
10 regions and scoping and screening inspections.
11 We've got the pilot program going on where
12 we are now going to be issuing all of those audit
13 reports and SEs, which will give us a point to
14 evaluate, and we just did what I'm going to call a
15 reasonably major assessment of Summer, Robinson and
16 Ginna to baseline ourselves on what the old process
17 cost, how much each task cost in each section so that
18 we have a baseline to know what the effect of our
19 improvements are or if they're not improvements, to
20 back off to the other place.
21 And also, in looking at the audits, the
22 audits have become kind of a big deal. They are about
23 ten man teams now that go out.
24 The audits are also connected with the
25 GALL update and we're committed to getting a draft of

1 the GALL update out in electronic form, and we're
2 thinking of GALL as a database now, not as a document
3 so that people can cross-cut it different ways. It
4 won't have full capability in September. December it
5 will have more volume and capability and will probably
6 double the systems and decisions that GALL covers. It
7 will go from being about 40 percent of aging
8 management programs to closer to 85 to 90 percent of
9 the programs, which fits very well with the audit
10 program we're having relative to the scope of the
11 people doing the audits.
12 And you'll find DE will be generally
13 focusing on TLAAs only, and that came out of the pilot
14 programs and past precedents in looking back on how
15 many decisions did we make in the past of slight
16 exemptions from GALL. So the GALL update is connected
17 to the audits, is also connected to what the regions
18 do. It's connected to this piece you're going to hear
19 from Jimi.
20 What we've got now is a backlog of
21 improvements and we can't make them all at once. So
22 we've kind of had to cue them up on maybe which ones
23 would have the most impact combined with the sense of
24 practical to do.
25 So I just wanted to note Jimi is one piece

1 of a whole lot bigger list of IOUs that we've got
2 going on. This is one we're going to try something
3 right away with relative to fixing.
4 And this was kind of interesting. I
5 guessed that we were about midpoint, and
6 chronologically 2006 is about the midpoint, which is
7 basically in a two-year review the applications we
8 currently have in house. So we're chronologically at
9 the midpoint of this program, and there is actually an
10 end in sight.
11 And, again, that depends on the light
12 blue.
13 MEMBER ROSEN: That light blue, the first
14 one, which one was that? It would be the first plant
15 that got a license renewal?
16 MR. GILLESPIE: You know what? I'm going
17 to tell you just from I don't know whether it's joking
18 around or just chatting, but the people from Progress
19 Energy have indicated that they think their team will
20 go through all of their plants and come right back
21 around to Robinson again. so I'm going to guess that
22 Robinson might be one, that they could come in in that
23 time frame.
24 And then there's Brunswick.
25 MEMBER KRESS: What, another 20 years?

1 MR. GILLESPIE: Yeah, for another 20 years
2 on top of the 20 they will have slightly entered their
3 renewal period and will have that decision to make.
4 CHAIRMAN BONACA: Only 20, huh?
5 MR. GILLESPIE: Yeah, because the rule is
6 once you're within 20, you can go for another 20.
7 MEMBER ROSEN: Is there any end to this?
8 MR. GILLESPIE: No. By the rule there is
9 no end, and you know, I actually have chatted with
10 people and said, you know, what would you do.
11 And they've said, "You know what? Given
12 the problems with siting a new plant, replacing the
13 vessel is not out of question."
14 And by the time you replace piping, you
15 replace steam generators, and you rewire the plant, it
16 may be like what is it, before the McDonald's was
17 built across the street that was remodeled from the
18 last restaurant? they left three columns and one I
19 beam in the middle, right?
20 (Laughter.)
21 MR. GILLESPIE: And built the restaurant,
22 but that was a remodel. So I have a feeling we're
23 seeing something --
24 MEMBER POWERS: It's going to be like
25 George Washington's ax.

1 MR. GILLESPIE: It's not a new plant.

2 MEMBER KRESS: It's got two new hands and

3 three new handles?

4 MR. GILLESPIE: Yeah. It's not a new

5 plant. It's just all new pieces.

6 CHAIRMAN BONACA: I think we will have to

7 have a new license renewal process by that time.

8 MR. GILLESPIE: And so that far in the

9 future, when you look at this --

10 MEMBER POWERS: And just think we may

11 actually have even phosphate in the concrete

12 correction by then.

13 MR. GILLESPIE: For some reason I always

14 thought phosphates were a buffer, but we're doing it.

15 We're doing it. We'll have that phosphate report

16 before the next renewal period.

17 So with that, let me turn it over to Jimi.

18 MR. YEROKUN: Good morning.

19 PARTICIPANTS: Good morning.

20 MR. YEROKUN: My name is Jimi Yerokun.

21 I'm from the Office of Research as P.T. mentioned.

22 Previous to that I worked in various

23 capacities in the Office of NRR with license renewal.

24 So I'm very familiar with the program.

25 What I have today is two activities.

1 Those two activities were performed to try to improve
2 the effectiveness of the reviews of license renewal
3 application in general, and although Frank and Dr. Kuo
4 have extensively said, you know, Jimi's -- these
5 activities resulted from the efforts of several
6 members of the task team.
7 I happen to be the lead for the task team.
8 I'm here on implementation. It's as a result of the
9 efforts of several staff members. I just want to
10 point that out.
11 MEMBER POWERS: Spread the blame.
12 (Laughter.)
13 DR. KUO: And plus the region's staff.
14 MR. GILLESPIE: Right.
15 MR. YEROKUN: The first item was an
16 assessment of the scoping and screening review
17 progress. Early this year a task team completed an
18 assessment of the NRC's review of the scoping and
19 screening review of license renewal applications.
20 The objectives of the task was relatively
21 simple: to review the process for duplicative
22 efforts; to look for excessive overlaps and to look at
23 the effectiveness of the guidance documents that exist
24 for review of license renewal applications and in the
25 end to recommend improvements that could be

1 implemented to make the process more effective. Those
2 are the simple objectives for the task.
3 The team was composed of staff members
4 that were familiar with the process. We had people
5 involved with the special activities, the safety
6 reviews, and we were part of the audit of the
7 methodologic process for the applications. So the
8 team was purposely composed of staff members that were
9 experienced in the license renewal application review
10 process.
11 However, there was some constraint imposed
12 on the team. They were also very simple. There were
13 improvements that must insure that we maintain a
14 complete review, and at some point we should be able
15 to define what a complete review is.
16 The improvements also or the changes that
17 are prescribed must be such that we can present those
18 improvements or changes to the OGC, for example, to
19 the ACRS, and even to the industry. So we are
20 constrained with those, and also obviously whatever
21 changes or proposal we come up with, we must continue
22 to meet the regulations.
23 So those are the critical constraints we
24 are forced to maintain.
25 And in conducting the assessment, the team

1 interacted with audit staff members as well as the
2 industry. So we did get some industry perspective
3 also into the activities of the team.
4 Here are the assessment results. The team
5 found that the license renewal program was being
6 implemented in accordance with the regulations and
7 with program documents. So that's important.
8 The team also identified that a complete
9 review involves licensing and inspection activities,
10 which are accomplished through the proper integration
11 of the audit of the methodology, a safety review of
12 the results, and inspection of the implementation.
13 So there's two activities, lessons learned
14 inspection and those three attributes. All integrate
15 together and constitute what a complete review is.
16 Nevertheless the team also identified some
17 areas for improvement. Three examples. The team
18 found instances where certain items are reviewed by
19 more than one group in the NRC with no real additional
20 value being added. An example of this is the audit
21 and inspection sample selection.
22 When the audit team goes out for the
23 methodology audits, they select some sample of systems
24 to verify their audits. When the inspection team goes
25 out for the inspection, they also select systems.

1 We found instances where the same systems
2 were looked at by the same teams for the same
3 application with no real additional value being added.
4 Second instance we identified were
5 instances where one group reviewed the same items
6 multiple times. The example of this is with the --
7 most notable with the safety reviews of 10 CFR
8 54.4(a)(2), systems, and also some unique plant
9 systems.
10 With these reviews, there were many
11 examples where there were several interactions with
12 the NRC staff and the applicant, you know, questions
13 upon questions in the form of RAIs on the same area.
14 So this was one of those examples where there was so
15 much duplicative review of the same item.
16 And in the case where we found examples
17 where weaknesses existed in guidance documents, there
18 were some minor inconsistencies among documents. For
19 example, the standard review plan had some needs that
20 were not consistent with some of the guidance in the
21 NAI document. So we find those inconsistencies.
22 We also find examples in documents where
23 some updates were necessary, like SRP also, and also
24 some inspection procedures are there. So we find
25 those three areas of weakness.

1 And the team came up with some
2 recommendations based on these findings. We group the
3 recommendations in these three and two primary areas.
4 The first area, the coordination and communication of
5 activities. I give an example of a weakness where you
6 have the audit group and the inspection team looking
7 at the same sample selection of systems.
8 So one of the recommendations was that the
9 methodology audit and inspection sample selection
10 should be coordinated so that you don't have the
11 excessive overlaps looking at the same system.
12 We also recommended that some audit and
13 safety review items could be scoped with inspections,
14 particularly those 10 CFR 54.4(a)(2) systems and the
15 unique plant systems. A lot of those were verified
16 through inspections as opposed to safety reviews.
17 Anything that came out from safety reviews were
18 multiple areas to try to get to the bottom of a
19 physical configuration of those (a)(2) systems.
20 So we recommended that some of those
21 systems be scoped within the inspections as opposed to
22 the safety reviews.
23 MEMBER LEITCH: This is Graham Leitch.
24 Jimi, I think that that's the criteria,
25 that 50.54(a)(2), under which some of us think the

1 steam dryers in our earlier discussion should be
2 included in the scope. Did you come to an independent
3 conclusion about that? Do you agree with that
4 thinking or is that something that we're missing?
5 MR. YEROKUN: No.
6 MEMBER LEITCH: It seems to me that the
7 steam dryer is -- based on my reading of (a)(2), it
8 seems like the steam dryer should be included in the
9 scope.
10 MR. YEROKUN: You know, whether a system
11 component should be in the scope or not was not
12 actually the focus of the team assessment. What we
13 focused on was the best means to review those systems
14 of competence that were (a)(2), (a)(1) or whatever in
15 scope.
16 So given the systems that were in scope,
17 what was the best avenue for the NRC to review those
18 systems.
19 MEMBER LEITCH: I see.
20 MR. YEROKUN: So that was what we focused
21 on, and what I'm talking about, some of these (a)(2)
22 systems, you know, this is systems where failures
23 could impact the systems. Without looking at the
24 physical configuration, it was sometimes difficult
25 just by review of documents to, you know, know the

1 complete scope of boundary of those (a)(2) systems.
2 So that's why those are verified through inspections,
3 and not all of them. That's just if these are
4 supposed to be in scope. I mean, that might not be
5 applicable to being, you know, within the inspection
6 here.
7 I hope that answers that. Okay.
8 MR. GILLESPIE: Jimi, I'm going to switch
9 to plain English a little bit here. One of the
10 dominant sources for RAIs in the scoping review coming
11 from the staff was the (a)(2) systems, was the
12 systems, not safety systems, which would impact
13 because we were getting things like they were in the
14 same compartment, but they were 150 feet apart. You
15 could not tell that sitting at a desk. Therefore, you
16 generated an RAI. They had to generate an answer, and
17 it was a relatively inefficient process.
18 So the source of this is there was a lot
19 of work being done on both sides, our part and the
20 applicant's side. Yet with an inspector walked in a
21 compartment, it was intuitively obvious to him what
22 the answer was.
23 And so that's the genesis of this one
24 particular bullet. It was a problem there that we saw
25 that really did need to get addressed.

1 MEMBER LEITCH: I see. Thanks, Frank.

2 MR. YEROKUN: And as part of the
3 recommendations, obviously with the witnesses we
4 identified in the guidance documents, we did recommend
5 that improvements be made on those documents. The
6 ones that need to be updated, you know, should be
7 updated, and the inconsistencies to be resolved.

8 We also had orders of subsidiary areas
9 that would recommend improvements, and one of them was
10 that the program should look closely at the scoping
11 and screening and the AMP inspections. There are two
12 team inspections to consider maybe those inspections
13 should be combined.

14 We also recommended that, you know,
15 consideration should be placed on whether an original
16 center of excellence should be established such that
17 the original inspections are going from one original
18 location as opposed from all four regions. That was
19 just something to help to minimize the impact on the
20 ROP for the original offices.

21 The team recommended that the lessons
22 learned, the ISGs, for example, that there should be
23 some quicker avenue to get those lessons learned out
24 to the reviewers. It was taking an excessive amount
25 of time to get some of those lessons learned out to

1 help with the sector reviews and activities of the
2 program.
3 And for the implementation of our
4 recommendations, the team did say that a plan should
5 be developed to carry out the implementation in a
6 systematic manner, and that plan has been developed,
7 and it's currently being implemented.
8 And the second part of my presentation is
9 on the sampling approach, also for the scoping and
10 screening reviews. In these areas, I tried to
11 accomplish three objectives in my discussion. I tried
12 to explain the limited scope of systems to which this
13 approach would be applicable; explain how the
14 selection of systems for detail review will be made;
15 and also fairly explain how the process is to be
16 implemented.
17 The sampling approach is to be applied
18 only for auxiliary and steam and power conversion
19 systems. These are systems that are reviewed by the
20 Plan Systems Branch in DSSA and NRR. Of these
21 systems, only those that are 10 CFR 54.4(a)(1) and
22 54.4(a)(2) systems are included. The 10 CFR
23 54.4(a)(3) systems are not included in this approach.
24 So the sampling approach is similar to
25 just those (a)(1) and (a)(2) systems. The sampling

1 selection will be influenced by the results of the
2 methodology audit such that if the issues identified
3 by the audit in the methods employed by the applicant,
4 then the sample size could be expanded or even
5 reconsidered. Just go back to looking at all of the
6 systems.
7 And also the sample results will be fed
8 back to the methodology reviewers, and there could be
9 grants for asking applicants to take additional
10 actions. So we try to do the feedback from, you know,
11 up front and post reviews.
12 MEMBER LEITCH: Jimi, I'm a little
13 confused as to the level at which the sample occurs.
14 Is it a system by system sampling? In other words,
15 there might be some systems that you wouldn't look at
16 --
17 MR. YEROKUN: Yes.
18 MEMBER LEITCH: -- or a component by
19 component, system by system?
20 PARTICIPANT: It's a system level.
21 MR. YEROKUN: It is system by system.
22 MEMBER LEITCH: Now, in a case where a
23 plant has a fairly unique system, would you always
24 take a look at that one? I mean, would that be
25 excluded from the sampling process?

1 I'm thinking about like we just talked
2 about Dresden and Quad Cities, like Dresden has a
3 shutdown cooling system that's not commonly found in
4 an isolation condenser. A few plants have that.
5 But I mean, would you take -- since those
6 are not more or less common systems, would you take a
7 specific look at those?
8 MR. YEROKUN: The intent is that those
9 considerations will be imposed on sample selection,
10 and the next slide actually gets into the criteria to
11 be employed for making the selections.
12 MEMBER LEITCH: Okay.
13 MR. YEROKUN: So hopefully that will get
14 to that.
15 MEMBER KRESS: I know I'm familiar with
16 sampling from a population that has random variation
17 to determine some sort of confidence in the variance
18 that one gets for certain properties. How is it you
19 can determine how much of a sample is sufficient for
20 these type of items where you're not really dealing
21 with random variation in particular properties?
22 How do you decide how much of a sample is
23 sufficient?
24 MR. YEROKUN: I think the same as this
25 slide also. I think that was touched on. If this

1 slide doesn't resolve and answer your question and
2 Graham's I'll go back to those questions.
3 This is the criteria for the sample
4 selection. You know, the program plans to employ a
5 smart sampling approach. It's not just random numbers
6 and move on.
7 The criteria to be used for the selection
8 of systems for detailed review include the following.
9 Plan to use risk insights. We plan to use experience
10 with previous application reviews and also operational
11 insights.
12 The selection will be non-random or maybe
13 random, but it's non-random such that the applicants
14 are not able to predict what systems would be reviewed
15 in detail, and the sample size will be at least 50
16 percent of the auxiliary and steam and power
17 conversion systems, and it could be as high as --
18 there's no limitations as to how high the sample size
19 could be. That depends on when we impose those
20 criteria I stated up front, experience would have all
21 applications personable in size risk and amenable
22 systems would determine to be included in sample size.
23 MEMBER POWERS: Let me ask a question.
24 MR. YEROKUN: That's what we've imposed.
25 MEMBER POWERS: Let me ask a question

1 about your third criterion. You look at the
2 experience you've had in the past, and we've now been
3 at this sort of exercise several years. So lots of
4 people doing it today will not have a conversant
5 memory of what happened on the first and second and
6 third of these, and so they're going to rely on the
7 documentation, probably the SERs to gain this
8 experience.
9 Yet in the documentation, you're basically
10 producing a document that says everything is okay.
11 You're not saying here we had to do all of this work
12 to get everything okay. I mean, it's an incomplete
13 record on that, and it's getting more and more
14 incomplete.
15 So where is this experience going to be
16 coming from as we approach this 2012 drop-off date?
17 I mean, what you want to do is select the
18 ones that people hack up. I mean, by now we know to
19 go look at the podium motors because they never put
20 them in scope, and the staff tells them put them in
21 scope, and they eventually give in. But, I mean,
22 there must be dozens of things like that where they
23 don't.
24 But increasingly those are not recorded
25 anywhere that somebody that was not intimately

1 conversant with the past would know about it.

2 MR. YEROKUN: Correct.

3 MEMBER POWERS: And you're going to retire

4 out all of those guys that are intimately conversant.

5 So we can't go ask them. So how are we going to get

6 this experience?

7 MR. YEROKUN: Well, you're absolutely

8 correct. It's a fair question. The experience --

9 MEMBER POWERS: Darn. I was looking for

10 an unfair one.

11 (Laughter.)

12 MR. YEROKUN: The experience is not

13 intended to be solely reliant upon documentation

14 because you're right. As you progress, you know, the

15 document gets smaller on those issues that would go

16 through to sort things out, get lost in the process.

17 MEMBER POWERS: And you --

18 MR. YEROKUN: The one group that does

19 these I pointed out earlier, the Plant Systems Branch

20 in DSSA. When they go through the reviews of the

21 applications and some issues come out that require

22 several iterations to get resolved, I mean, the intent

23 of the experience is knowledge of those systems that

24 are hatched up or not, you know, well addressed from

25 all the reviews. So it's not to be a combination of

1 experience from document and also experience from the
2 individuals and who they work in the branch that looks
3 at, you know, this system.
4 So it's a combination of both.
5 MEMBER POWERS: Well, now you're going to
6 a system or you're making a recommendation. I don't
7 know that you're going to a system, but you're making
8 a recommendation that says, hey, rather than sorting
9 out every little thing with an RAI, let's just go
10 look, and we'll intuitively see that the question he
11 had was not a useful question to ask, but everything
12 else will get resolved like that as well, and so once
13 again, there's no documented record. Nobody can find
14 out what the history is here.
15 I mean, you're facing a situation in which
16 so many of your experienced personnel are approaching
17 retirement the oral history is disappearing as well.
18 MR. YEROKUN: I mean, I understand that,
19 but we're talking systems. You know, we're talking
20 big picture issues. You had a discussion earlier this
21 morning on the steam dryers. If that, for example,
22 was part of scope and license renewal, (a)(2), you
23 know, that's one of those systems that will definitely
24 be part of the selection, and that kind of the
25 experience is out there.

1 I know the experience will be lost as
2 people retire, but I don't think it will really be
3 completely lost such that the knowledge of what
4 systems that definitely have to be included for that
5 specific reason --
6 CHAIRMAN BONACA: As a help, could you
7 establish some kind of criterion that says that if you
8 find, you know, disagreements with several items, the
9 sampling can be expanded, some kind of criterion that
10 at least gives you a test that, you know, you go
11 through an evaluation. You're only reviewing a little
12 bit more than 50 percent of the auxiliary system. You
13 look at them and you find that the applicant has not
14 included things that by experience should have been
15 there.
16 MR. YEROKUN: Right.
17 CHAIRMAN BONACA: Could you establish
18 that, you know, if that is exceeding a certain
19 percent, you do additional sampling?
20 MR. YEROKUN: Actually that's part of the
21 consideration. When you select a sample size for
22 review, if the issues, you know, at some threshold
23 with the sample size selection, you definitely -- if
24 the grant is to increase the sample or go back and
25 even do the whole representative look at the systems,

1 the previous slide kind of touches up on that; that
2 the results would be fed back to the methodologic
3 reviewers and could be grounds for asking the
4 applicant to take additional actions or even
5 reconsider the sample selection for that particular
6 application. So --
7 CHAIRMAN BONACA: You have some criteria
8 for expanding the sampling if you find that there are
9 problems there.
10 MR. GILLESPIE: I think the answer to your
11 questions, and I'm going to commit to it here, is that
12 the SRP for the licensing staff and the inspection
13 procedure for the inspection staff has to be thorough
14 enough to give them enough guidance to know what
15 they're looking at.
16 And when we're writing those, I think we
17 just do have to do that.
18 Most recently, by the way, it was on Quad
19 Cities. Three months before we ended the review, 26
20 additional systems were added to the review. I think
21 it was 26. Something like that, PT?
22 DR. KUO: Yes.
23 MR. GILLESPIE: It was in groups of ten,
24 and so there is a need to gather these lessons learned
25 both on our side and on the industry side. So we

1 don't want those last minute surprises, and this was
2 (a)(2) systems.
3 CHAIRMAN BONACA: The issue that you raise
4 is an important one, particularly because you're also
5 relying on contractors, aren't you?
6 MR. GILLESPIE: Yes.
7 CHAIRMAN BONACA: And when you're on
8 contractors, I mean, you have people coming in and
9 out, and you have inexperienced people at times.
10 DR. KUO: Yeah, this is especially true
11 now that we are doing the audit. For every audit that
12 we write the audit report, a very detailed,
13 comprehensive audit report of what they have looked
14 at, what they found, what issue they or what question
15 they raise and what, it's a very comprehensive audit
16 report, and that, I think, is the kind of
17 documentation that we like to see.
18 And, by the way, even for this sampling
19 here for the inspection, the region generally will
20 issue the inspection reports after each inspection,
21 and that also documents what the system did look at
22 and what they resolved.
23 MR. YEROKUN: Okay. The last slide, it's
24 the overall conclusion for the two topics I touched
25 upon. The intention is to improve the effectiveness

1 and efficiency of the license renewal application
2 review process and also to insure that there's always
3 reasonable assurance that those components that are
4 passive and long-lived and subject to reviews are
5 properly identified.
6 And that concludes my presentation, and at
7 this point I and the program reps. will be glad to
8 answer any additional questions you might have.
9 (No response.)
10 CHAIRMAN BONACA: None. Evidently it was
11 a good presentation. Appreciate the update, and thank
12 you.
13 Any other questions of members?
14 MEMBER KRESS: One question. You say
15 you're going to do at least a 50 percent sample
16 regardless.
17 MR. YEROKUN: Yes.
18 MEMBER KRESS: So the potential saving in
19 effort is 50 percent review of those particular kinds
20 of systems. I don't have a good notion. Is that a
21 significant savings in time and effort or is it a
22 small saving?
23 DR. KUO: All systems have a lot of
24 subsystems.
25 MEMBER KRESS: A lot of subsystems?

1 DR. KUO: Yeah, a lot of subsystems.

2 MEMBER KRESS: So it's important in time

3 and effort to look --

4 MR. GILLESPIE: We're talking about whole

5 FTEs on a review, yes. The dominant place for the

6 RAIs in the systems group in this question is in the

7 aux systems and all of those peripheral systems, and

8 that's kind of why Jimi got the assignment to put

9 together a task group, is we started seeing that the

10 RAIs and the questions were being dominated by this

11 one area.

12 And then when you looked at the kind of

13 RAIs that you're getting, many of them licensees were

14 saying things weren't in scope because they were a

15 long way away, which is as opposed to saying it is in

16 scope, but we don't have to do anything because it's

17 a long way away. So we're working those issues, which

18 brings things into scope.

19 And then even if it is in scope, do you

20 have to do anything?

21 That was really a dominant piece of the

22 reviews.

23 MEMBER KRESS: Well, how will you address

24 the potential criticism from outside that your review

25 is incomplete because it's just a sample of part of

1 that?

2 I mean, that seems to me like a reasonable

3 criticism that somebody might come up with. You need

4 to be able to answer that.

5 DR. KUO: Yeah. More importantly, we are

6 not only looking for efficiency. We are also here

7 looking for effectiveness. The reason we are trying

8 to do this, especially for 50.4(a)(2), is because this

9 has to do with non-safety related structure over

10 safety related functions.

11 Sometimes when one staff is sitting in a

12 room, in their office, okay, looking at even drawings

13 may not be effectively identifying any components or

14 structures that really should be within the scope of

15 license renewal. The only better way to do it is to

16 go out to the plant and look at it, identify it.

17 There is something that you never thought

18 about it. It could be there, and that could impact on

19 safety functions. So that's the kind of thing we've

20 tried to od also.

21 CHAIRMAN BONACA: Although you would

22 expect that the licensees would be more conscientious

23 with the NSS components and less with the auxiliary

24 systems.

25 DR. KUO: Yes, right.

1 CHAIRMAN BONACA: And so you really are
2 cutting back on the scope in the areas where you are
3 more likely to find that they are not doing the job as
4 they should.
5 DR. KUO: Right. Just like Frank pointed
6 out earlier, you know, on Dresden and Quad Cities, at
7 the last months we had received the input on there are
8 about 30 systems because of this (a)(2) issue.
9 MR. GILLESPIE: Yeah, I understand your
10 question. The interesting thing is we're sampling
11 what's not included. Really what you're doing, you're
12 taking those drawings that are highlighted in magic
13 markers and crayons, and you're saying, okay, I'm not
14 going to look at what they've put in because I don't
15 have to question that. I have to look at what they
16 haven't included.
17 And so basically we're saying we'll look
18 at 50 percent of the stuff that's connected that
19 wasn't included, and if we see a problem in that 50
20 percent, then we're going to look real hard at the
21 other 50 percent because then you're seeing a systemic
22 thing.
23 If you don't see something that would
24 indicate that it's a carryover or a kind of a mindset
25 question, then I have no problem defending it looking

1 at 50 percent of what's not included is enough.

2 And the other aspect is, again, the

3 inspection aspect, which isn't a system. It's a

4 spatial distribution. It's almost like a fire

5 protection inspection. You're going into a

6 compartment and saying what non-safety systems in this

7 compartment could impact the safety systems in the

8 compartment.

9 And so it's recognizing a slightly

10 different approach when you take the inspection

11 approach and recognizing that you're looking at

12 spatial relationship rather than system relationships

13 then, and that really is best done by looking at the

14 actual relationships.

15 So those are the two areas we're trying to

16 get at with this.

17 DR. KUO: And there's also another piece

18 there. The staff also verifies the methodology. We

19 review and approve the methodology for scoping and

20 screening. So this is the whole thing combined

21 together.

22 Then we thought it would be much better to

23 do a more effective way, is to take a sample, but do

24 a real inspection verification there.

25 MEMBER LEITCH: Has this process been used

1 at Farley, or what's the first plant that will see
2 this?
3 CHAIRMAN BONACA: It was used at Farley,
4 yeah.
5 DR. KUO: Brunswick.
6 CHAIRMAN BONACA: I thought that you had
7 to test it at Farley.
8 MR. GILLESPIE: Different audit. That's
9 what I said. We've got multiple irons in the fire.
10 That's the engineering side. This is the scoping
11 side, and we're asking the same similar questions.
12 Can you assure effectiveness and
13 thoroughness better on site than sitting in a cubicle
14 on the assessment side? So Jimi is the other half.
15 MEMBER LEITCH: Okay, but what's the first
16 plant we'll see where you've used this process that
17 Jimi described?
18 DR. KUO: Most likely at Brunswick, which
19 hasn't come in yet. It will be coming in later this
20 year.
21 MEMBER LEITCH: And I assume in the SER or
22 someplace it will be annotated somehow so that we'll
23 know when we're reviewing which ones fell within your
24 sample.
25 DR. KUO: Definitely, they will.

1 MEMBER KRESS: Yeah, as part of the
2 question, it might be helpful to us and other people
3 for this first one that you're going to test this out.
4 Do it with the sampling process, but then go ahead and
5 do the full sample and see how effective your sampling
6 technique was.
7 MR. GILLESPIE: A good suggestion.
8 MEMBER KRESS: You know, only just for the
9 first one at least.
10 MEMBER ROSEN: You may end up with more
11 work.
12 MEMBER KRESS: Well, from the first one
13 you'll end up with more, but it's at least some sort
14 of test of -- anyway, it's a thought.
15 MR. YEROKUN: Well, I think the built in
16 constraints to, you know, the feedback from the
17 methodology audit, the inspection and the results of
18 the sampling, if it's such that it has no great
19 satisfaction that the feedback loops were to expand or
20 even to do the 100 percent, that would be carefully
21 looked at for the first one to be sure that we have
22 that assurance that, you know, it's a good approach.
23 So you know, I'm sure the program would
24 think about what is suggested, but you know, to take
25 a sample and to do 100 percent, sometimes you can get

1 a little less effective to be more at the end. That's
2 something that really could be thought of, too.
3 MEMBER KRESS: Because the 50 percent
4 seems a bit arbitrary, too.
5 MR. YEROKUN: It's at least 50 percent.
6 You know, we have all of these criteria where you pose
7 all. You select the systems, and if at the end you
8 don't have the number, then you have to really go --
9 I mean, you know, there's no upper limit to the sample
10 selection size, but there are some things you have to
11 consider, the risk, you know, experience, and all of
12 those things, and if it adds up to 80, 90 percent,
13 that's just your sample.
14 So that's a driver as opposed to the
15 number. The number is just the minimum constraint.
16 MR. GILLESPIE: There's also some self-
17 improvement going on here. The industry itself is
18 revising itself, is looking at its format guide with
19 95.10, and this whole (a)(2) thing has been kind of a
20 running controversy between us and their working
21 group, and they keep trying to do less and we keep
22 saying no, and I think the message has gotten across
23 that non-safety systems and compartments with safety
24 systems are in scope, and then tell us why you don't
25 have to do anything rather than saying they're not in

1 scope.

2 So there's other things going on which are

3 actually going to affect the -- it may be 50 percent

4 of a much smaller increment, I hope, than we've had in

5 the past, but in this case the staff has been very

6 consistent, I think, since this first came up on Hatch

7 with its view.

8 MR. YEROKUN: Okay.

9 CHAIRMAN BONACA: all right.

10 MR. YEROKUN: Thank you.

11 CHAIRMAN BONACA: Thank you.

12 Before we break for lunch, just a couple

13 of announcements.

14 One, for the members. One, we do have

15 Graham Leitch now at this time for the last day. So

16 we decided to have a group photo at 12:30.

17 PARTICIPANT: A what?

18 CHAIRMAN BONACA: A group picture of the

19 ACRS.

20 MEMBER POWERS: Oh.

21 CHAIRMAN BONACA: At 12:30. I believe

22 it's in the other room, right?

23 MEMBER APOSTOLAKIS: That's where we take

24 all of our pictures.

25 CHAIRMAN BONACA: Yeah, that's where

1 normally we take our pictures. So that's the first
2 thing.
3 Second, we have arranged dinner tonight at
4 the Outback, and I don't know the exact time. I think
5 it's going to be about 7:15, 7:30, something like
6 that, and so we're going to say goodbye to Graham. I
7 think John is --
8 MEMBER LEITCH: So long.
9 MEMBER KRESS: Adios.
10 CHAIRMAN BONACA: Adios. So with that, I
11 think it would be good if whoever is planning to go
12 would tell Noble so that at least he has a count
13 because we're trying to get a reservation there.
14 Normally they don't, but they said that would see to
15 that.
16 So if you are not coming, just let Noble
17 know.
18 PARTICIPANT: I assume everybody is
19 coming.
20 CHAIRMAN BONACA: Yeah.
21 MEMBER KRESS: yeah.
22 MEMBER APOSTOLAKIS: Is Mr. Graham still
23 a member?
24 PARTICIPANT: Mr. Leitch?
25 MEMBER LEITCH: No.

1 CHAIRMAN BONACA: Yeah, we should have
2 gone off the record for this, but that's okay.
3 PARTICIPANT: He's still a special
4 government employee.
5 CHAIRMAN BONACA: So let me take a recess
6 until 12:45.
7 (Whereupon, at 11:41 a.m., the meeting was
8 recessed for lunch, to reconvene at 12:45 p.m., the
9 same day.)
10 CHAIRMAN BONACA: Back into session. And
11 the first item on the agenda is proposed tech specs
12 for ensuring steam generator tube integrity. Dr.
13 Ford.
14 MEMBER FORD: Thank you, Mr. Chairman.
15 This presentation addresses the staff's evaluation of
16 changes in technical specifications being proposed for
17 steam generator tubes. The changes are in general
18 accordance, as we understand it, with NEI document
19 9706. And if you remember, we issued a letter in
20 December 2001, in which we concluded that 9706 and the
21 related generic license change package was flexible
22 enough to take into account technical changes. And it
23 also provided an enforceable regulatory structure.
24 We also concluded in that 2001 letter that
25 there was a need for additional technical

1 justification to support the industry's position on
2 the inspection for Alloy 600TT and 690TT. Also,
3 understand that this presentation is just for
4 information only. So, Louise, I'll pass it on to you
5 to lead your team through this next one hour.
6 MS. LUND: Okay.
7 MEMBER FORD: Thank you.
8 MS. LUND: Thank you, Dr. Ford. My name
9 is Louise Lund, and I'm the Section Chief for the
10 Steam Generator Integrity and Chemical Engineering
11 Section in the Materials and Chemical Engineering
12 Branch in NRR. We're here to brief you on proposed
13 changes to the steam generator technical
14 specifications and update you on the issues that have
15 been resolved since our last briefing on this topic.
16 Emmett Murphy of my section will be making
17 a presentation on our safety evaluation, capturing in
18 his review the changes to the steam generator
19 technical specifications. In addition, we're supposed
20 to have some folks from the technical specification
21 section. I don't see them here yet. Kerry Kavanagh,
22 who also reviewed the changes to the steam generator
23 technical specifications.
24 MEMBER APOSTOLAKIS: What's the purpose of
25 animating it?

1 MS. LUND: Well, I didn't do that on
2 purpose. Let's see if I've got all the pieces yet.
3 MEMBER SHACK: The lead plant.
4 MS. LUND: There you go.
5 MEMBER KRESS: Is that lead-cooled or lead
6 --
7 MS. LUND: We'll get into that. As you
8 know, the staff has been working on revising the
9 regulatory framework for steam generators for a
10 significant length of time. The staff worked on a
11 rule making, followed by a generic letter, and
12 ultimately became engaged in considering an industry
13 initiative referred to as NEI 97-06. The technical
14 specification portion of the initiative was submitted
15 to the NRC staff as a generic license change package,
16 but was later submitted for a lead plant through the
17 license amendment process. The original generic
18 package will be revised to reflect what is approved
19 for the lead plant.
20 During our last briefing of the ACRS on
21 this topic, we discussed the NEI 97-06 program
22 guidelines, the technical specification changes that
23 are contained in the generic license change package,
24 the issues we had left to resolve, and risk
25 considerations. We have completed our review of the

1 technical specification changes, and we sent the draft
2 safety evaluation to you a few weeks ago.
3 Since we sent the safety evaluation to
4 you, OGC, the Office of General Counsel, has reviewed
5 it and has no legal objection. And at this point, I'm
6 going to ask Emmett to come in and discuss the
7 details.
8 MEMBER SHACK: Louise, I thought every
9 plant had already adopted 97-06.
10 MS. LUND: We're talking about the --
11 there's three components to NEI 97-06. There's
12 program guideline document that was just the overall
13 guidelines for how to put together a program. There
14 is the technical specification component, which is the
15 part that we're reviewing. Okay. And then there's
16 also the EPRI guidelines, so there's actually three
17 components to that particular regulatory steam
18 generator management framework.
19 MR. BATEMAN: And, Dr. Shack, just as a
20 point of interest, industry has agreed as a full group
21 to comply with the NEI 97-06, so in that sense they
22 have taken it on.
23 MEMBER SHACK: Everybody is going to
24 switch to the new tech specs then?
25 MR. BATEMAN: We're going to get into that

1 discussion, I think, as part of -- if we don't, ask it
2 at the end. It's a good question.
3 MR. MURPHY: NEI 97-06, of course, is an
4 industry initiative, all utilities, all PWR utilities
5 have committed to follow that initiative.
6 VICE CHAIRMAN WALLIS: All three parts to
7 this initiative? His question was have all utilities
8 already activated NEI 97-06, and the answer wasn't
9 clear. Are they activating all three parts of the 97-
10 06?
11 MR. MURPHY: I missed your explanation of
12 what the three parts were.
13 MS. LUND: Well, the three parts were the
14 NEI programmatic guidelines, the actual guideline
15 document, and the EPRI guidelines. And then there's
16 the technical specification part. And the technical
17 specification part, of course, is the part that we
18 review of this. And we had a letter -- Jim, help me
19 with the date on that, back in 2002, that committed
20 the industry to following the NEI 97-06 program
21 guidelines.
22 MR. RILEY: This is Jim Riley, NEI. I'm
23 NEI's Project Manager for steam generator materials
24 issues. There's probably a couple of letters maybe,
25 Louise. I'm not sure which one you're referring to,

1 but there was a vote called an initiative. Emmett
2 referred to it in 1997, where all the Chief Nuclear
3 Officers agreed to meet the requirements of NEI 97-06
4 by the first refueling outage after January 1st, 1999.
5 And that has been done, and all the PWRs are following
6 97-06. And we say that, I mean not only 97-06, but
7 the EPRI guidelines that Louise referred to which are
8 referenced in NEI 97-06, and which provide the details
9 on what ought to be in a steam generator program. So
10 the industry has been following that for a number of
11 years.
12 What we tried to do with the tech specs is
13 put a regulatory framework to all these requirements.
14 That's what Emmett's going to brief you on, what we've
15 been working on for the past number of years.
16 A number of years ago, we surveyed the
17 industry to find out whether they intended to follow
18 the lead on generic license change package, and at
19 that time, we had a unanimous agreement that they
20 would follow the GLCP. Now I have to caution you that
21 a survey was done probably three years ago, something
22 like that, and it has -- the GLCP has evolved since
23 then.
24 I don't have anybody I know of that isn't
25 going to follow the GLCP, and what we're getting

approved here generically through the TSTF process, but I haven't taken a survey to verify that that's the fact recently.

MS. LUND: I think from our perspective, our expectation is is that all the plants will be changing to these new tech specs. We'll discuss that a little bit further in the presentation.

MR. MURPHY: I will be presenting a discussion of the new tech specs for ensuring steam generator tube integrity. Industry has submitted a generic license change package for NRC staff review and approval. This change package is intended to serve as a template for subsequent plant-specific submittals.

The generic license change package proposes a new set of technical specifications incorporating largely performance-based requirements for ensuring steam generator tube integrity. The staff and the industry have reached resolution of all outstanding technical issues and regulatory issues regarding the generic license change package. This isn't working.

MEMBER SHACK: You got a bullet.

MR. MURPHY: Well, I missed --

MEMBER SIEBER: We can read it.

1 MR. MURPHY: At the bottom of the page, a
2 lead plant tech spec package has been submitted for
3 Farley Units 1 and 2, based on the generic license
4 package and incorporating the above resolutions to the
5 various issues that we're dealing with.
6 We expect to complete our review of the
7 Farley amendment by September 17th, 2004, and issue a
8 safety evaluation by that date. We conclude that new
9 tech specs modeled on the generic license change
10 package will address the shortcomings of current tech
11 specs, and will ensure good integrity.
12 The current --
13 VICE CHAIRMAN WALLIS: Does your slide
14 presentation have anything to do with what was handed
15 out?
16 MEMBER SHACK: We're missing three pages.
17 They go from 2 to 5.
18 MR. MURPHY: They're printed on both
19 sides.
20 VICE CHAIRMAN WALLIS: No, but there are
21 some pages missing.
22 MEMBER APOSTOLAKIS: I have three and
23 four.
24 VICE CHAIRMAN WALLIS: I don't have any
25 page three or four.

1 MR. MURPHY: I'm not sure what happened.
2 Current tech specs specify the scope and frequency of
3 inspection and require that tubes exceeding the tube
4 repair criteria be brought to repair prior to
5 returning the steam generators to service. Thus,
6 operability of the steam generators is tied to
7 completing the SG surveillance requirements.
8 It's long been recognized by the staff and
9 by the industry that current tech spec requirements
10 for SG inspection and repair are prescriptive and out-
11 of-date. These requirements are not focused on the
12 key objective of ensuring tube integrity for the
13 entire period between in-service inspections.
14 MEMBER ROSEN: I hear your words, but I
15 don't get a flavor for it. Give me an example.
16 MR. MURPHY: The current requirements are
17 a cookbook of you inspect so many tubes at such and
18 such a frequency, and all the tubes you find to be
19 defective you plug. And if you do that, it's assumed
20 that you'll be adequately maintaining tube integrity
21 while you're in service. There is no direct
22 assessment of how well you're maintaining tube
23 integrity margins, structural margins, leakage margins
24 during the inspections. There's no direct
25 relationship between the surveillance program and

1 having a solid pace that you're maintaining tube
2 integrity.
3 The fact that you're plugging a tube
4 that's defective, that tube although it may not have
5 burst, may not have the sorts of structural margins
6 you are trying to maintain. That may be the result of
7 inadequate inspections or inspection frequencies that
8 are just not frequent enough, so one needs to be aware
9 of how well he's maintained his margins so that he can
10 adjust his program accordingly, such that he is
11 maintaining the desired margins. And I'll be
12 discussing desired margins.
13 In view of these shortcomings, licensees
14 have taken actions beyond minimum tech spec
15 requirements as necessary to ensure that tube
16 integrity is maintained. There are industry
17 guidelines, including NEI 97-06, and guidelines
18 referenced therein that provide all sorts of guidance
19 to utilities as to how they should design their
20 programs to ensure steam generator tube integrity, not
21 simply comply with existing tech specs.
22 VICE CHAIRMAN WALLIS: What's the
23 criterion for integrity?
24 MR. MURPHY: Later on in this
25 presentation, I'll be talking about so-called tube

1 integrity performance criteria, such if met --

2 VICE CHAIRMAN WALLIS: You'll get to it.

3 MR. MURPHY: -- ensures tube integrity.

4 As Louise indicated, we last briefed you on December

5 1st. At that time, we had some outstanding issues

6 that we identified to you with respect to the generic

7 license change package as it stood at that time.

8 One of the key issues we identified to you

9 at that time was issues pertaining to inspections,

10 particularly steam generator inspection intervals, and

11 whether or not there should be some limitations on how

12 long an inspection interval might be based on

13 performance-based principles.

14 Other criteria that have come up since

15 that time include the need to clarify the structural

16 integrity performance criteria with respect to non-

17 pressure type loadings, and I'll be talking about that

18 in the next few minutes.

19 MEMBER FORD: Emmett, I can see you're

20 just running down the list of focal points here, and

21 are we going to discuss in any technical detail this

22 concern that we had in 2001 about the justification

23 for the inspection intervals?

24 MR. MURPHY: Yes.

25 MEMBER FORD: We will be talking about

1 that later on today?

2 MR. MURPHY: I'll be discussing what has

3 been done to the tech specs to ensure that inspection

4 intervals will be frequent enough.

5 MEMBER FORD: Okay. And a justification

6 for those inspection -- the prescriptive formula that

7 was given in 2001 was every ten years or whatever it

8 was, you would inspect so much percentage of the

9 tubes. But there's no technical justification given

10 for those numbers that we could see, and by that first

11 bullet, I'm assuming that you have looked at that, and

12 you are satisfied with it.

13 MR. MURPHY: I will be explaining the

14 surveillance requirements and the basis for those

15 surveillance requirements.

16 MEMBER FORD: Good.

17 MR. MURPHY: Resolution of these issues

18 proved to be a very challenging process involving a

19 lot of give-and-take between us and the industry to

20 help expedite the resolution of these issues. The

21 generic license change package was supplemented or

22 complemented by a lead plant submittal. This put us

23 into a more structured process, regulatory process,

24 including time limits goals for resolving the

25 outstanding issues.

1 The scope of the proposed technical
2 specifications is nothing less than a total overhaul
3 of the technical specifications as they apply to steam
4 generator tube integrity. The changes include a
5 revised LCO spec for operational leakage, wherein the
6 leakage limit would be reduced from 500 gallons per
7 day, which is the limit at many if not most plants
8 today, to 150 gallons per day per steam generator.
9 Second, it would include an entirely new
10 LCO spec entitled "Steam Generator Tube Integrity",
11 and I'm going to touch upon that briefly in a moment.
12 VICE CHAIRMAN WALLIS: Yes, because
13 there's a way in which these things can fail, not
14 having leaked at all.
15 MR. MURPHY: Yes. And a primary objective
16 of the performance criterion, the performance-based
17 strategy is to make sure the tubes are capable of
18 sustaining accidents --
19 VICE CHAIRMAN WALLIS: Operational
20 transients and things.
21 MR. MURPHY: Right. That's where the risk
22 all comes from.
23 MEMBER SHACK: Emmett, just in my head -
24 I mean, I keep thinking that plants are running at 150
25 GP per day now, but that's really only for 95-05

1 plants that have that.

2 MR. MURPHY: Correct. A few other plants.

3 MEMBER SHACK: Okay. There would be some

4 sort of alternate repair criteria.

5 MR. MURPHY: Correct. But unless there

6 was an ARC or something of that kind, then they would

7 have a 500 gallon per day limit. So now everybody

8 will come on board with the 150.

9 MEMBER ROSEN: Bill, you said that plants

10 are now running with 150 gallon per day. I don't

11 think so. You meant 150 gallon per day limit.

12 MEMBER SIEBER: Limit.

13 MR. MURPHY: Okay. We also have a new

14 admin tech spec establishing a largely performance-

15 based steam generator program. This replaces the

16 existing surveillance requirements in the tech specs,

17 and I'll be talking about those in fair detail.

18 Following there are some revised reporting

19 requirements in the tech specs, I'm not going to say

20 any more about in the interest of time.

21 With respect to the new LCO and steam

22 generator tube integrity, basically what we're doing

23 with this LCO is to tie SG operability directly to

24 maintaining tube integrity, rather than simply tying

25 it to completing a specified inspection program. You

1 inspect this many tubes at this frequency, plug
2 everything that needs to be plugged, so we're tying
3 operability of the steam generators to actively
4 maintaining tube integrity relative to some
5 performance criteria.
6 MEMBER APOSTOLAKIS: Surely, though, there
7 must have been a reason why people proposed old rules
8 that you are criticizing in the other slide. There
9 must be -- you have to speak to the microphone even
10 though you're addressing me. I mean, one thing I've
11 learned over the years being on this committee is that
12 there is always something behind the regulations as a
13 reason. You're telling us that the previous
14 inspection program really was not connected to steam
15 generator integrity. I find that hard to believe.
16 MR. MURPHY: Since I've begun to associate
17 myself with steam generator issues in 1979, it's my
18 experience that utilities have frequently invariably
19 found it necessary to go beyond the minimum
20 requirements of the technical specifications to have
21 reasonable assurance that they are, in fact,
22 maintaining tube integrity. A good example is the
23 minimum sampling requirement of the current technical
24 specifications of 3 percent of the tube population
25 during a given inspection as an initial sample.

1 Utilities generally sample at a much higher sampling
2 level than that.
3 MEMBER APOSTOLAKIS: So what I gather then
4 is that operating experience suggested that the
5 previous requirements were not sufficient.
6 MR. MURPHY: That's correct. And we have
7 -- the steam generator experience is riddled with
8 close to 200 forced outages related to SG leakage,
9 tube ruptures, tens and tens of thousands of tubes
10 plugged through the years, many replacements.
11 MS. LUND: But isn't it also true, Emmett,
12 that when the tech specs, the old tech specs were
13 developed wastage was a predominant degradation
14 mechanism. And over time, as we learned different
15 mechanisms, then I think that our knowledge-base
16 increased and that led to a lot of the additional
17 things that licensees had to do in order to maintain
18 steam generator tube integrity. Would that be a fair
19 statement?
20 MR. MURPHY: Yes.
21 MEMBER SIEBER: Well, there was a change
22 in chemistry years ago. Wastage occurred in
23 phosphate-type plants, and then the all volatile, they
24 ended up with all kinds of cracks and so forth due to
25 impurities in the crevices, so the mechanism changed

1 as well as the phenomenon.

2 MEMBER ROSEN: The cure was marginally

3 better than the disease.

4 MEMBER SIEBER: That's debatable. The

5 ultimate cure is replacement.

6 MR. MURPHY: Okay. The new admin tech

7 spec entitled "Steam Generator Program" defines a

8 largely performance-based approach to be followed for

9 ensuring tube integrity. Specifically, the new spec

10 will state that a steam generator program shall be

11 established and implemented to ensure steam generator

12 tube integrity is maintained, and that's a pretty

13 performance-based requirement. However, we dressed

14 this performance-based requirement up a little bit.

15 We say that in addition, the steam

16 generator program shall include a number of

17 provisions. First, the new tech specs will define

18 steam generator tube integrity performance criteria,

19 such as if met, you would -- it's assumed that you

20 have tube integrity, criteria are commensurate then

21 with tube integrity.

22 The tech specs will include provisions for

23 condition monitoring, which means that we're

24 monitoring the condition of the tubes relative to the

25 performance criteria.

1 In addition, the steam generator program
2 spec will include requirements for tube repair
3 criteria, SG tube inspections, and provisions for
4 monitoring operational leaks.
5 MEMBER APOSTOLAKIS: So you will tell us
6 what the performance criteria are.
7 MR. MURPHY: Yes, coming right up.
8 MEMBER SHACK: But the criteria themselves
9 are defined in the 97-06 document, not in the tech
10 specs.
11 MR. MURPHY: No, we're going to have them
12 in the tech specs.
13 MEMBER SHACK: In the tech specs.
14 MR. MURPHY: Yes. Okay. We have three
15 different types of performance criteria for tube
16 integrity. We have structural criteria, we have
17 accident leakage criteria, and an operational leakage
18 criteria, and I'll discuss each of these in a moment.
19 MEMBER POWERS: One can surely understand
20 how one would monitor operational leakage criteria.
21 Bit of a mystery to me how you monitor accident
22 leakage criteria.
23 MR. MURPHY: I can speak to -- how about
24 I answer that question when we get to -- I'll be
25 discussing that criteria, and maybe that's a good

1 point to address it.

2 MEMBER POWERS: That would be fine.

3 MR. MURPHY: Okay. In formulating these

4 performance criteria, we looked for a number of

5 attributes to evaluate their adequacy. We expected

6 these performance criteria to be measurable, either

7 directly or indirectly, and that's what I'll be

8 telling you about the accident leakage criterion that

9 is an indirect measurement. And that the consequences

10 of the --

11 MEMBER POWERS: I mean, you said it's an

12 indirect. We had defined performance metrics to be

13 something that was directly measurable or easily

14 calculable from a direct measurement.

15 MR. MURPHY: Well, let me amend my answer

16 a little bit. It could also be done directly through

17 an in situ leakage test. Typically, only a small

18 fraction of tubes are in situ leakage tested, so

19 primarily we rely upon analysis of the inspection

20 results to characterize leakage potential for the

21 cracks. However, outstanding cracks, so to speak,

22 will frequently be subjected to an in situ pressure

23 test to demonstrate their leakage potential under

24 accident conditions.

25 MEMBER POWERS: I'm going to be patient

1 and wait, because I somehow remember a clot of voltage
2 of a signal versus leakage that would not inspire any
3 kind of analysis.
4 MR. MURPHY: Okay. I'm aware of questions
5 of this nature that have been raised. Those questions
6 and that issue exist irrespective of whether we're
7 talking about the old regulatory framework or the new
8 framework. The new tech specs don't speak to your
9 question directly.
10 VICE CHAIRMAN WALLIS: The attribute being
11 measurable I think is an important issue, how well you
12 can measure the things you're really interested in
13 predicting.
14 MR. MURPHY: Okay. Well, let's continue
15 to talk about this perhaps when we get to that
16 particular criterion, the accident leakage criterion.
17 VICE CHAIRMAN WALLIS: Because you can
18 have the most wonderful criterion, but the
19 measurements may not be very good. And then deducing
20 whether or not you meet the criterion may be
21 problematic.
22 MR. BATEMAN: This is Bill Bateman of the
23 staff. I think this will become a lot clearer once
24 Emmett gets a chance to get further into his
25 presentation.

1 VICE CHAIRMAN WALLIS: Well, he keeps
2 tantalizing --
3 MR. BATEMAN: I know, he is tantalizing.
4 And I didn't realizing that we would be tantalizing
5 you so much.
6 MR. MURPHY: The issue of which you speak
7 comes up in the context of an alternate repair
8 criterion. The resolution of the issues of which I
9 think you're referring to are in the context of an
10 alternate repair criterion. These tech specs that
11 we're talking about today are independent of any
12 alternate repair criterion. If one has an alternate
13 repair criteria and associated requirements, it's
14 plugged into the tech spec framework that I'm talking
15 about. But the issue of what constitutes an
16 acceptable alternate repair criteria, and how you
17 calculate leakage when applying that specific
18 alternate repair criteria, that's an issue that's
19 addressed within the context of the alternate repair
20 criteria.
21 MEMBER POWERS: Well, I wouldn't confuse
22 alternate repair criteria for explicit physical data
23 that had been collected. Now whether they've been
24 collected in connection with an alternate criteria
25 doesn't matter. It matters only that we know that the

1 data are. And if the data don't inspire analysis, or
2 the data don't inspire confidence in the measurement,
3 I don't care where they came from.
4 MR. MURPHY: Okay. When doing an
5 inspection, one comes up then with an inventory of
6 flaws found by the inspection. One characterizes the
7 geometry's flaws. In general, one may perform an
8 analysis of each of these flaws based on its geometry
9 and size to establish the leakage potential associated
10 with each of the flaws. If there are some flaws that
11 look like they might be particularly marginal from the
12 standpoint of being the applicable performance
13 criteria, one can resort to a physical in situ
14 pressure test, test the tube with the offending flaw
15 up to an equivalent to main steam line break pressure,
16 and assess the leakage under those conditions.
17 VICE CHAIRMAN WALLIS: The path from
18 detecting flaws to predicting leakage is not a very
19 straightforward, short, broad one, is it? It's given
20 some measurement of flaws interpreted in some way.
21 Predicting leakage is not an exact science.
22 MR. MURPHY: Well, clearly there are
23 orders of magnitude uncertainty associated with any
24 nominal leakage prediction for a given crack. And
25 clearly, there is a need when doing an assessment of

1 alternate performance criteria, to consider the
2 uncertainties.
3 VICE CHAIRMAN WALLIS: Maybe the
4 performance criteria should be based on cracks, not on
5 leakage, based on the thing that you actually measure.
6 MR. KARWOSKI: I think that would be more
7 consistent with the current approach. And we know one
8 of the potential problems with that is depending on
9 the degradation mechanism that you have, you're
10 talking specifically about cracks. But then we would
11 have to develop similar limits for wear-type flaws,
12 volumetric-type flaws, circumferential cracks, axial
13 cracks. So the approach that you're suggesting is
14 more consistent with what we have now, one criteria
15 that fits all the degradation mechanisms, which tends
16 to be overly conservative.
17 We understand some of the issues with
18 respect to correlating leakage to certain parameters.
19 And as Emmett indicated, there is a lot of scatter in
20 the data, but we believe that the EPRI guidelines and
21 our review of alternate repair criteria provide some
22 confidence that we've conservatively bounded the
23 estimate of leakage. And we're not looking at the
24 leakage to meet the accident --
25 VICE CHAIRMAN WALLIS: I'd be happy with

1 direct measurement of leakage. I mean, you measured
2 Boron in the condenser or something.
3 MR. MURPHY: There are many issues,
4 technical issues that exist with respect to how one
5 should be managing SG tube integrity, how one should
6 inspect, how one should perform tube integrity
7 analysis. These issues exist irrespective of whether
8 we have old tech specs, or whether we have new tech
9 specs.
10 VICE CHAIRMAN WALLIS: Well, the tech
11 specs have to be enforceable, so there has to be a way
12 of measuring this leakage. That's the whole point,
13 isn't it?
14 MR. MURPHY: Yes. But also, a key
15 consideration is going to be -- of these new specs is
16 we don't do any harm; that is, we don't give up a
17 critical line of defense that has been effective for
18 us in the past. And have a set of requirements that
19 is more realistic in terms of considering past
20 experience and what we really have to be concerned
21 with, and a more effective approach for ensuring
22 integrity while at the same time not putting licensees
23 unnecessarily into a burdensome situation.
24 Just finally with respect to attributes,
25 we attempted to maintain consistency with the current

1 licensing basis in terms of structural margins we're
2 trying to maintain or allowed leakage. Finally,
3 sometimes risk was a consideration. In the case of
4 the accident leakage criteria, I will discuss the
5 desire not to cause an increase in risk factored into
6 the performance criteria.
7 MEMBER FORD: Before you go into a
8 detailed discussion, Emmett, of the various attributes
9 in the performance criteria, let me just check - are
10 there any other presentations from the industry?
11 MR. RILEY: I don't have a presentation.
12 MEMBER FORD: It's just we're slightly
13 over half-time here.
14 MR. MURPHY: Okay. The structural
15 criterion requires that you maintain tube integrity
16 over the entire range of conditions that the steam
17 generators will be subjected to. This would include
18 maintaining a factor of 3 under normal operating
19 pressure differential, and a factor of 1.4 under
20 design-basis accident differentials. This is a
21 criterion that we discussed with you back in '01.
22 Since that time, we've had considerable
23 interaction with the industry over safety factors that
24 should apply to non-pressure type loadings. And what
25 has been agreed upon is a safety factor of 1.2 under

1 combined pressure, and non-pressure primary design-
2 basis accident loads. And 1.0 for --
3 VICE CHAIRMAN WALLIS: These are all these
4 transient stresses due to things moving around in the
5 steam generation.
6 MR. MURPHY: Yes. Bending, seismic.
7 VICE CHAIRMAN WALLIS: And it's because
8 you didn't have them in before, you needed a bigger
9 safety factor before; 1.4 was to cover these other
10 things, and now you know them better, you have only
11 1.2.
12 MR. MURPHY: Well, the 1.4 --
13 VICE CHAIRMAN WALLIS: That's based on
14 pressure differential.
15 MR. MURPHY: The 1.4 were applied to
16 pressure differentials, which is normally controlling.
17 You tend to have maximum bending moments in thermal
18 loads at times when you don't have maximum pressures.
19 Usually, in general, the pressure loadings are the
20 dominant consideration. But for completeness, we have
21 appropriate criteria here for the non-pressure loads.
22 MEMBER APOSTOLAKIS: What does a safety
23 factor of 1 mean?
24 MR. MURPHY: We're talking about axial
25 secondary loads. In Section 3 of the code, a one-time

1 application of secondary stresses is assumed not to
2 cause component failure. For tubing, where we have --
3 say once-through tubing which is subjected to very
4 significant axial thermal loads, and if we were to
5 have a large circumferential crack, or a
6 circumferential crack, the assumption in Section 3 of
7 the Code for design may not be appropriate for
8 evaluating a cracked component in service. So this
9 factor of 1 here for axial secondary loads is really
10 intended to address thermal loads and once-through
11 type steam generators. And we didn't talk about
12 thermal loads. We talked in terms of secondary loads,
13 because there are cases where the thermal loads, once-
14 through type generators, should be treated perhaps as
15 primary loads.
16 If you have a large crack, a very large
17 circumferential crack, the thermal load may behave
18 more as a primary-type load than a secondary-type
19 load. And industry guidelines would provide guidance
20 to the utilities on when they should think of the
21 summer loads as being primary or whether they should
22 be secondary.
23 MEMBER APOSTOLAKIS: It's not a safety
24 factor any more.
25 MR. MURPHY: Well, if it's a secondary

1 load and it's computed elastically, when that analysis
2 is saying that you have a safety factor of 1, you
3 actually, you're not at the point of failure.
4 VICE CHAIRMAN WALLIS: Does that mean you
5 have 5 percent chance of failure, or 50 percent?
6 MEMBER APOSTOLAKIS: That was my next
7 question. Are these factors the result of a
8 negotiation, or the result of some sort of analysis of
9 the actual probability of failure?
10 MR. MURPHY: No, not as a result of an
11 analysis of the probability of failure. These safety
12 factors were derived from stress limits in the ASME
13 Section III Code. The challenge was to infer the
14 safety factors against failure that the stress limits
15 were intended to ensure.
16 MEMBER APOSTOLAKIS: I see. Which are
17 also the result of some sort of give-and-take.
18 MR. MURPHY: Right. Well, there are a
19 variety of ways one might look at it. A philosophical
20 issues come up when you talk about what the fathers of
21 the code had in mind in the way of margins when they
22 set the stress limits, but these were -- the 1.2 was
23 a consensus position adopted by both the industry and
24 the staff, after great deliberation.
25 VICE CHAIRMAN WALLIS: But one does have

1 a significant margin. It's not as if one represents
2 the average load at which the thing will break.
3 MR. MURPHY: That's correct.
4 VICE CHAIRMAN WALLIS: It's somewhere out
5 of the 95th percentile.
6 MEMBER APOSTOLAKIS: What are they? I
7 mean, the safety factor is the ratio of something.
8 MR. MURPHY: Safety factor is the ratio of
9 failure load. It's failure load divided by allowable
10 load.
11 MEMBER APOSTOLAKIS: Yes, but I mean the
12 failure load is some sort of a low bound with a bunch
13 of data.
14 MR. MURPHY: Well, this 1.2 --
15 MEMBER APOSTOLAKIS: Or is the medium
16 values
17 of --
18 MR. MURPHY: Is 1.2 considered a numerator
19 for failure load. We considered code minimum material
20 properties.
21 MEMBER APOSTOLAKIS: So it's a
22 conservatively calculated --
23 MR. MURPHY: It's conservatively
24 calculated.
25 MEMBER APOSTOLAKIS: But we don't know

1 conservative is.

2 MR. MURPHY: The code values are pretty

3 conservative, in my experience.

4 VICE CHAIRMAN WALLIS: So if 1 is X psi,

5 this means that a certain fraction of them will break,

6 and then if you say you must design for 1.2X, that

7 means even smaller fractions of them are going to

8 break. But we don't know anything about what those

9 fractions are.

10 MR. MURPHY: I'm not sure I understand the

11 question. These are --

12 VICE CHAIRMAN WALLIS: If I test 100

13 pressure points, and I say they're designed for 15

14 psis. They probably don't break until about 100 psi,

15 so you said there's a safety factor of 7 or something.

16 Is that what it means? Does the 1, when I get down to

17 1, does it mean that half of them are going to break,

18 or a very small fraction are still going to break or

19 what?

20 MEMBER APOSTOLAKIS: I guess they're

21 relying on the fact that the load is calculated very

22 conservatively.

23 VICE CHAIRMAN WALLIS: It must be.

24 MEMBER SHACK: A secondary load is -- you

25 know, if it was true that this thing was loaded with

1 a big dead weight hanging on the end of the tube, is
2 one thing. But the thing about a secondary load is
3 it's a thermal stress, so a small deformation
4 essentially will ease the load. And so that's why
5 you, without going into a great deal of detail, you
6 know that up until this time, you're just beginning to
7 elastically perform, basically.
8 MR. MURPHY: And the loads are computed
9 elastically, so the load doesn't take -- the
10 computation of the load does take into account this
11 relaxing effect that you're talking about, so the
12 analysis is very conservative.
13 VICE CHAIRMAN WALLIS: But this 1 comes
14 back to the simple stretching of the weight. Does
15 that mean that half of them would pop at that load, or
16 it means a ratio of --
17 MEMBER SHACK: If you were hanging dead
18 weights on the end of tubes, yes. But it could --
19 VICE CHAIRMAN WALLIS: Half of them --
20 MEMBER SHACK: If the thing has a failure
21 strain of 50 percent, it means you have to extend the
22 tube 8 inches, and it can only move a quarter of an
23 inch. All it's going to do is deform.
24 VICE CHAIRMAN WALLIS: So I guess we were
25 asking what you meant by 1.

1 MEMBER FORD: Could I just interject a
2 managerial point here - about 20 minutes left, and
3 we've got some really interesting things on inspection
4 periods coming up. And it's also fairly obvious to me
5 that --
6 VICE CHAIRMAN WALLIS: We're trying to
7 understand if he understands what 1 means.
8 MEMBER FORD: I recognize that, Graham.
9 I was about to say, it's fairly obvious to me that we
10 will have --
11 VICE CHAIRMAN WALLIS: Yes, I agree.
12 MEMBER FORD: Which you can discuss all of
13 these -- the whole credibility of his presentation.
14 VICE CHAIRMAN WALLIS: All right.
15 MR. MURPHY: If the calculated plastic
16 collapse load is equal to the applied elastic load, or
17 the applied load evaluated elastically, if that number
18 is 1, that's deemed acceptable and you actually have
19 a considerable margin beyond that point since it does
20 now account for the relaxation of load that takes
21 place as a result of filling the tube.
22 MEMBER APOSTOLAKIS: I guess what I got
23 out of this is what Dr. Shack said, there's much more
24 to this story than just the safety factor.
25 MEMBER SHACK: In the secondary load in

1 the formula, when you hit the pressure burst load it
2 blows up, so there's a dramatic difference in what you
3 mean by failure. In one case, there really is margin
4 and you don't need the extra margin.
5 MR. MURPHY: Okay. The accident leakage
6 performance criteria has two --
7 VICE CHAIRMAN WALLIS: I think it would
8 help everybody if instead of talking about safety
9 factors, you talked about probability of failure.
10 MR. MURPHY: They don't have --
11 VICE CHAIRMAN WALLIS: We don't know what
12 you mean then, do we?
13 MEMBER SIEBER: Well, it's deterministic.
14 It's a number.
15 MEMBER FORD: If you remember back in
16 2001, this is exactly the same question we asked then
17 - what the safety factors really meant physically, and
18 all questions --
19 MR. MURPHY: We were trying to maintain
20 consistency with the design-basis, which was Section
21 3 of the code, which consists of deterministic stress
22 loads.
23 MEMBER SIEBER: It's deterministic.
24 MEMBER APOSTOLAKIS: So what's going to
25 happen throughout the years we going to have another

1 presentation --

2 VICE CHAIRMAN WALLIS: We'll keep asking -

3 -

4 MEMBER APOSTOLAKIS: But that's okay. I

5 mean, this is the standard way of doing business.

6 MR. MURPHY: The accident leakage

7 criterion consist of two parts.

8 MEMBER APOSTOLAKIS: Which DBA is this

9 now?

10 MR. MURPHY: The design-basis accident,

11 whatever is the most limiting one, the most limiting

12 one from the standpoint of off-site dose.

13 MEMBER APOSTOLAKIS: Which one is the most

14 limiting?

15 MR. MURPHY: Usually steam line break, I

16 believe is the basis of this. Design-basis accident

17 leakage should not exceed values assumed in the FSAR's

18 accident analysis to ensure acceptable dose

19 consequences off-site in the control room. In

20 addition, DBA leakage should not exceed 1 gpm from all

21 steam generators.

22 VICE CHAIRMAN WALLIS: That's pretty

23 small.

24 MR. MURPHY: Yes. And leakage beyond this

25 value may potentially increase risk under severe

1 accidents. So if one is going to -- if someone wishes
2 to allow more leakage than 1 gpm, we would need to
3 take a look at that from a risk-informed standpoint.
4 VICE CHAIRMAN WALLIS: How are you going
5 to measure 1 gpm?
6 MEMBER SIEBER: You do it by isotopic
7 analysis, typically.
8 MR. MURPHY: Again, if my --
9 MEMBER SHACK: If it's a design-basis
10 accident, he'll measure it.
11 VICE CHAIRMAN WALLIS: It's all
12 theoretical. I deal with that kind of space.
13 MEMBER SIEBER: You're into DBA --
14 MEMBER APOSTOLAKIS: So you told us
15 earlier that this number was 500 before, and now it's
16 150.
17 MR. MURPHY: Correct.
18 MEMBER APOSTOLAKIS: Why?
19 MEMBER FORD: Five hundred gallons a day.
20 MEMBER APOSTOLAKIS: Yes.
21 MR. MURPHY: The plant will be shut down
22 before a rupture occurs.
23 MEMBER POWERS: That was not my
24 understanding. My understanding was that the 450 was
25 set up for a three-loop plant, and this is per loop.

1 Right?

2 MR. MURPHY: The 150 is per steam

3 generator. Yes, correct.

4 MEMBER POWERS: Yes, it's per loop.

5 Whereas, the 450 was set up for a three-loop plant.

6 MR. MURPHY: Well, the 500 gallons per day

7 applied to each steam generator, as well.

8 MEMBER POWERS: Yes. The 450 applies to

9 a three-loop plant.

10 MR. MURPHY: This is one your

11 documentation. I'm quoting you. By limiting leakage

12 to 150 GPD per generator, yes. Then for a three-loop

13 plant the total leakages, all SGs can be 450.

14 VICE CHAIRMAN WALLIS: Now these -- I'm

15 sorry to keep asking questions. These numbers like 1

16 gpm, 150, are they pulled out of the sky, or are they

17 based on risk information or what?

18 MR. MURPHY: The 1 gpm is a rather

19 historical number. Plants were originally licensed

20 considering 1 gpm leakage as the initial condition for

21 their safety analysis.

22 VICE CHAIRMAN WALLIS: Just pulled out of

23 the sky. It goes back into the depths of history

24 somewhere, and no one knows why.

25 MEMBER SIEBER: It's a nice number.

1 VICE CHAIRMAN WALLIS: One-fifty is
2 something you're doing.
3 MR. MURPHY: That's the 1 gpm. The 500
4 gallon per day limit was developed in the mid-1970s.
5 It was intended to -- it had a slightly different
6 purpose. It was intended to reduce the likelihood of
7 tube rupture, that you would shut the plant down
8 before you had a tube rupture. Going from 500 to 150
9 gallons per day is to provide added assurance to that
10 effect.
11 VICE CHAIRMAN WALLIS: Why not 75 or 291
12 or something?
13 MR. MURPHY: Well, the industry has
14 guidelines that attempt to ensure that the plants
15 don't operate beyond 75 gallons per day. Those are
16 the guidelines indices we're working to. What we've
17 agreed to as far as the tech spec is concerned is 150.
18 They can typically be expected to shut down well
19 before they get to the 150.
20 MEMBER POWERS: In any of the nine or so
21 steam generator tube ruptures that we've experienced
22 were they preceded by leakage in excess of 150 gallons
23 per day per steam generator?
24 MR. MURPHY: Possibly one, the first one,
25 Point Beach. But the circumstances surrounding Point

1 Beach back in '75 are rather murky, so we don't really
2 know for sure. In general, no - leakage was less than
3 the 150 or the 500 at the time rupture occurred. At
4 Indian Point, it was just 6 gallons per day. At what
5 plant was it that had no leakage - that was McGuire.
6 McGuire had no leakage prior to rupture in '89.
7 MEMBER APOSTOLAKIS: So what does this do?
8 MR. MURPHY: There have been 204 shutdowns
9 due to SG leakage. There's no question that many of
10 those would have been tube ruptures had the plants not
11 shut down. Sure, limiting leakage is not an air-tight
12 defense against preventing tube ruptures or ensuring
13 adequate margin, but these limits certainly do, and
14 are effective for reducing the instance of tube
15 ruptures where you don't have sufficient margin.
16 MEMBER FORD: Emmett, I'd like to finish
17 by 2:00. I recognize you're being constrained by all
18 our questions.
19 MEMBER SIEBER: Just don't answer them.
20 MR. MURPHY: At this point, I'm going to -
21 - I think I've already explained that during each
22 inspection, plants will be evaluating the condition of
23 their tubes relative to performance criteria that's
24 condition monitoring. Going beyond that, I don't
25 think there's anything more I need to say about tube

1 repair criteria, other than the fact that we will be
2 specifying tube repair criteria in the new tech specs.
3 It's somewhat of a departure from true blue
4 performance-based, but --
5 MEMBER FORD: Can I ask you, Louise, is
6 there a plan to come in front of the ACRS to give us
7 -- obviously, as I look through these following pages,
8 there are a lot of statements being made which are
9 just aching to be challenged or asked for information.
10 Is it your plan that you will come in front of the
11 ACRS to give us more technical data, drafts, and
12 things of this nature presentation?
13 MS. LUND: Yes, if that is what you'd like
14 to see. In fact, especially I was thinking for the
15 600 Thermally Treated and 690 Thermally Treated, not
16 only have we had licensee submittals report on that,
17 we have also independently put together a review of
18 600 Thermally Treated and 690 Thermally Treated
19 experience in the plants. In fact, we put out one of
20 them as a NUREG, and there's one of them we're in
21 process of putting out as a NUREG. It's almost
22 complete, so we have -- behind the scenes, we have
23 been doing a lot of things to look at these particular
24 issues that you've brought up. And I think we've
25 convinced ourselves that -- I don't mean to short-

1 circuit what Emmett's going to talk about, but these
2 particular values, as far as the inspection intervals,
3 would be sufficient.
4 MEMBER FORD: I'm not trying to close. I
5 just wanted reassurance to the rest of the committee
6 that we're going to hear more about this, data,
7 drafts, et cetera, et cetera.
8 MS. LUND: Yes. We're fine with taking
9 any of these specifics. The question -- I guess our
10 interpretation of what we needed to present today
11 considering we only had an hour was to give you an
12 overview of where we were at, and also kind of just
13 give you an overview of the safety evaluation which we
14 sent over. If there are certain parts of it that
15 you'd like to discuss in more detail, we probably need
16 to schedule additional -- what I'm seeing from here is
17 we need to schedule additional time. This would not
18 have covered --
19 MEMBER APOSTOLAKIS: You're supposed to
20 finish something by the 17th.
21 MS. LUND: Right.
22 MEMBER APOSTOLAKIS: Which is the safety
23 evaluation report.
24 MS. LUND: Right.
25 MEMBER APOSTOLAKIS: And then what

1 happens, it goes to the Commission?

2 MS. LUND: No. Basically when it's put in

3 the license amendment process, is that it comes in, we

4 review it, and then we approve it through the license

5 amendment process.

6 MEMBER APOSTOLAKIS: But I mean, if the

7 ACRS is going to have a subcommittee meeting and

8 someone will write a letter later, is there a time

9 constraint there, or we can do it at our leisure,

10 before something real happens.

11 MR. MURPHY: Something real is going to

12 happen on the 17th. A plant is going to have new tech

13 specs.

14 MEMBER SHACK: That's Farley's tech specs.

15 MEMBER APOSTOLAKIS: And then what

16 happens? I mean, if we write a letter, does it affect

17 anything? We're not going to write on by the 17th, I

18 doubt.

19 MR. MURPHY: Well, we also have in mind to

20 write a generic SE that would apply to the Generic

21 License Change Package. Since that will be a template

22 for future SEs, we'll be putting that one out for

23 public comment, so potentially that's something --

24 MEMBER APOSTOLAKIS: SC?

25 MR. MURPHY: SE, a generic --

1 MEMBER SIEBER: Safety evaluation.

2 MEMBER APOSTOLAKIS: Oh, SE.

3 MS. LUND: Right. How this works is you
4 have a lead plant then you put together the lead plant
5 and the safety evaluation associated with the lead
6 plant, and then you basically put together something
7 that is generic, a package, a box within which the
8 rest of the licensees can use to help their Ses.

9 MEMBER FORD: What I suggest is, let them
10 talk with our staff and arrange a meeting. Obviously,
11 we're going to need more information, more technical
12 data. I tried to take the --

13 MR. MURPHY: Well, let me just wrap-up
14 here. I'll take five minutes to talk about
15 inspections. And then I'll take five minutes to talk
16 about where we're going.

17 With respect to inspections, the new
18 requirements in the tech specs will have both a
19 performance-based aspect to it, and a set of
20 prescriptive requirements to ensure that we don't get
21 into too big a trouble.

22 From a performance-based aspect is that
23 the inspection scope, methods, and frequency of
24 inspections shall be such as to ensure that SG tube
25 integrity is maintained until the next scheduled

1 inspection.

2 MEMBER APOSTOLAKIS: Is that a performance

3 requirement?

4 MR. MURPHY: No, this is not a performance

5 criteria. This is --

6 MEMBER APOSTOLAKIS: Programmatic

7 approach.

8 MR. MURPHY: This is a programmatic

9 requirement.

10 MEMBER APOSTOLAKIS: But how do -- and

11 there are accepted methods that one can use?

12 MR. MURPHY: The industry has guidelines

13 for looking at your inspection results, trying to

14 figure out what your flaw growth rates are, taking

15 into account what your eddy current flaw measurement

16 error may be, and trying to project the condition of

17 the steam generator tubes at the end of the next

18 cycle, or when you plan to do the next inspection, and

19 demonstrate that the inspection interval and so forth

20 are such that you will meet all the performance

21 criteria at the end of the next cycle.

22 If that analysis indicates you're not

23 going to meet all the performance criteria when you

24 make your next inspection, then you need to adjust

25 program, you need to inspect more frequently, you need

1 to do something.

2 VICE CHAIRMAN WALLIS: You can regulate

3 them with the probability.

4 MR. MURPHY: No.

5 VICE CHAIRMAN WALLIS: Are you specifying

6 what that probability is?

7 MR. MURPHY: No.

8 VICE CHAIRMAN WALLIS: But you cannot be

9 deterministic in this.

10 MR. MURPHY: Sure.

11 VICE CHAIRMAN WALLIS: You can be probably

12 deterministic about flaw growth.

13 MEMBER POWERS: I think they do.

14 MEMBER SHACK: Make sure every tube is 3

15 Delta P by the end of the next cycle --

16 VICE CHAIRMAN WALLIS: But you can't say

17 every tube always is perfect. I mean this isn't that

18 kind of --

19 MEMBER POWERS: Three delta, I mean three

20 standard deviation --

21 VICE CHAIRMAN WALLIS: Three standard

22 deviations, okay.

23 MEMBER SHACK: Three-delta P.

24 VICE CHAIRMAN WALLIS: No, that doesn't do

25 it.

1 MEMBER SHACK: The strength of the -- the
2 weakest tube has to meet the three-delta P
3 requirement.
4 MR. MURPHY: The criterion states that the
5 tube shall maintain a factor of three-delta --
6 MEMBER SHACK: Now what happens if it
7 doesn't meet it? If it's 2.5 delta P, do you lash him
8 with a wet noodle?
9 MR. MURPHY: No. We have the Reactor
10 Oversight Program. First such an eventuality would be
11 reportable under 50.72.73, so it's reportable. We
12 find out about it. Two, we're written up screening
13 criteria for the Reactor Oversight Program. We relate
14 each of these performance criteria to red, yellow, and
15 white, and so forth.
16 MEMBER SHACK: So he would go white or
17 something if he misses it?
18 MR. MURPHY: For example, failing to meet
19 three-delta P, if you fail to meet three-delta P,
20 there's also plant-specific considerations or specific
21 facts you have to consider, but in general, that might
22 put you into the white category, yes, for example in
23 terms of risk significance. So anyway, if you fail to
24 meet the performance criteria, its reportable and two,
25 the Oversight Program then takes a look at it.

1 MS. LUND: And if there's a performance
2 element as far as the licensee goes, then that's when
3 you would end up with some type of inspection to
4 follow-up, to see what's actually going on.
5 MEMBER SHACK: Suppose he had a loose part
6 where there was nothing there at the beginning of the
7 cycle, and he ended up with less than three-delta P at
8 the end of the cycle, is that a performance
9 deficiency?
10 MS. LUND: Well, it depends on whether he
11 knew he had a loose part or not. I mean, we've had
12 actually even recently situations where we've had
13 plants experiencing primary, secondary leakage and you
14 end up with a loose part that could have been
15 detected, so that's --
16 MR. MURPHY: One of the nice things about
17 a performance-based set of requirements is we're
18 basically saying do what you've got to do to ensure
19 tube integrity. And if turns out you don't have tube
20 integrity, then obviously you weren't doing everything
21 that was necessary to ensure tube integrity.
22 MEMBER RANSOM: How do you determine if
23 these meet three-delta P? Do you hydrotest each tube?
24 MR. MURPHY: We may.
25 MEMBER RANSOM: And you'll rupture it if

1 it goes to --

2 MR. MURPHY: As a first step, you gather

3 your inspection results, you look at each of the

4 indications individually, and you ask yourself how big

5 are they, and given how big they are, what is the

6 predicted burst pressure of each of these flaws. If

7 there are some that look like they may be starting to

8 get marginal in terms of having three-delta P, you

9 might decide to do an in situ pressure test. You'll

10 pressurize the individual tube and take it up to three

11 times normal operating pressure and see if it holds or

12 not.

13 MS. LUND: The EPRI guidelines has

14 screening criteria. And the screening criteria does

15 exactly what Emmett says that it does, but in

16 addition, it also talks about new degradation

17 mechanisms too need to be screened. I mean, there's

18 other additional things that might get put into the

19 bin in doing in situ pressure tests to confirm that

20 they do have structural integrity.

21 MR. MURPHY: Okay. Just in terms for

22 inspections, I've explained that we have a

23 performance-based requirement concerning the scope,

24 methods, and frequency of inspection. We've

25 supplemented this performance-based requirement with

1 a series of prescriptive requirements that would
2 ensure that in the event that we have a condition
3 where the performance criteria are not met, that such
4 a situation will be detected in a timely fashion.
5 Corrective actions will be implemented in a timely
6 fashion in accordance with Appendix B. So for mill
7 annealed tubing, the original steam generators, first
8 generation steam generators, we do expect the
9 requirement will be that you do an inspection every
10 refueling outage. If you have the --
11 VICE CHAIRMAN WALLIS: Inspection means a
12 certain percent of the tubes?
13 MR. MURPHY: Under these new tech specs,
14 we will not specify --
15 VICE CHAIRMAN WALLIS: They have to do
16 however much inspection they need to do to ensure
17 integrity.
18 MR. MURPHY: That's right. For thermally
19 treated tubing, 600 Thermally Treated tubing, they can
20 operate for as many as two fuel cycles between
21 inspections, if performance-based analysis shows that
22 they can maintain their integrity margins for that
23 long. And finally, for 690 Thermally Treated tubing,
24 they can operate for up to three fuel cycles.
25 VICE CHAIRMAN WALLIS: When are they going

1 to discover that 690 isn't as perfect as everybody
2 believes?
3 MR. MURPHY: They can operate up to three
4 fuel cycles if they can show by analysis based upon
5 the flaws they've seen before, that they're going to
6 be maintaining the appropriate margins until their
7 next scheduled inspection. And with that, I think
8 I'll just move on then to a close.
9 MS. LUND: Did you want to cover that
10 slide?
11 MR. MURPHY: That's a good point. I'll
12 mention that one. With this new advanced tubing, the
13 600 Thermally Treated and the 690 Thermally Treated,
14 if they ever run into a cracking problem, they start
15 detecting cracks, they can no longer operate for
16 multiple cycle inspections. They'll have to inspect
17 it every --
18 MEMBER SIEBER: Go back to the 600 mill
19 annealed.
20 MEMBER SHACK: Now when Seabrook finds 600
21 TT tubing that really isn't TT, does that mean they
22 have to inspect the rest of their 600 TT tubing?
23 MR. MURPHY: That's a real fine point.
24 I'm not sure I want to get into that right now. I've
25 only got five minutes left.

1 MEMBER SIEBER: Saved by the bell.

2 MR. MURPHY: All right. Future actions -

3 we intend to complete our review of lead plant

4 amendment requests. We're about to issue our SE or

5 safety evaluation for Farley 1 and 2 by September

6 17th. We have an existing amendment request in just

7 in August for South Texas 1 and 2. We're expecting

8 any day now to get a revised amendment request from

9 Catawba 1 and 2.

10 Next, we're going to complete our review

11 of the Generic License Change Package submitted by

12 NEI and issue a draft SE for public comment. Once

13 this SE is finalized, the CLIIP process can be used to

14 expedite subsequent tech spec amendment requests from

15 utilities.

16 MEMBER SHACK: And the CLIIP process is?

17 MS. LUND: It's Consolidated Line Item

18 Improvement Process. Did I get it all? That's why I

19 have Kerry here.

20 MR. MURPHY: All right. The staff is

21 preparing a draft generic letter entitled, "Steam

22 Generator Tech Specifications", which it expects to

23 issue for public comment in early fall of --

24 MEMBER APOSTOLAKIS: That's where we are

25 now. Right? This is already fall of 2004.

1 MS. LUND: We'll be going to CRGR on that.
2 We're trying to schedule a meeting with them. We have
3 not done that yet.
4 MR. MURPHY: Okay. What this GL -- we
5 don't know what a plant's intentions are with respect
6 to -- whether all utilities are going to be submitting
7 these new tech specs or not, and so this generic
8 letter is going to help us determine what the
9 industry's intentions are. The generic letter will
10 request information regarding the program each utility
11 is implementing right now to ensure tube integrity,
12 and we're requesting information concerning licensee
13 plans for modifying their tech specs to reflect their
14 program.
15 It's our expectation that licensee
16 programs are modeled on NEI 97-06, and to the extent
17 that's true, then they're implementing a program that
18 parallels very much these new tech specs, so they then
19 have alignment of the tech specs with their NEI-based
20 program. And that's it.
21 VICE CHAIRMAN WALLIS: What's a "liming"
22 condition?
23 MR. MURPHY: The new tech specs are based
24 --
25 MEMBER APOSTOLAKIS: Look at the slide

1 before you answer.

2 MS. LUND: it's misspelled.

3 MEMBER FORD: I thank you both very much

4 indeed. Obviously, there's a lot of information

5 behind all these slides. I think that we should leave

6 it up to respective staffs to schedule a meeting with

7 Materials Subcommittee and the Full ACRS Committee in

8 the near future. I don't know what near is, but in

9 the future.

10 MR. BATEMAN: Dr. Ford, could I request

11 that if we do have a meeting, there is so much data

12 associated with steam generator arena, it would be

13 helpful if you would be specific to the best of your

14 ability to let us know what you want us to talk about.

15 I mean, if you wanted to talk about safety factors of

16 1, if you want us to talk about three-delta P, if you

17 want us to talk about -- we need some help here

18 because it's a very broad area.

19 MS. LUND: We could definitely talk for

20 days.

21 MEMBER POWERS: We need to see the

22 technical basis for your technical specifications, and

23 understand what the technical rationale - whatever

24 data it takes to understand that, that's what we need

25 to see.

1 MR. BATEMAN: So you want to see the
2 technical data behind the performance criteria, which
3 is the design and licensing basis, so it wouldn't be
4 much of a presentation there. Anyway, I think we're
5 having a little communications. I just want to be
6 sure that if we come back and brief you on something,
7 that we understand what it is that you want, so that
8 we can make the appropriate presentation. This
9 presentation was not intended to get into the areas we
10 got into. It was intended to give you an overview of
11 where we stood with this moving forward.
12 MEMBER FORD: Earlier this year we had
13 some very extensive discussions on the DPO issue,
14 performance of the tubes under accident conditions,
15 and some of that data is obviously relevant to some of
16 the conclusions that you've come to. The whole
17 question of probability aspects, tube ruptures,
18 leakages. We will make up a list.
19 MR. BATEMAN: Okay. Thank you.
20 MEMBER FORD: But we do need to see the
21 data.
22 MS. LUND: I think as you guys discussed,
23 the presentation we made, I think that you also need
24 to keep in mind too that our need to keep this
25 consistent with the design and licensing basis of the

1 plant, which that Section 3 argument was all about,
2 because that's how the plants are designed, the steam
3 generators are designed. And we had to maintain
4 consistency with that, so keep that part in mind.
5 MEMBER FORD: Okay. Louise and Emmett,
6 thank you very much indeed. Pass it over to you,
7 Graham.
8 VICE CHAIRMAN WALLIS: Thank you, Dr.
9 Ford. I was going to congratulate you on finishing
10 exactly on time, but you're actually a minute and a
11 half over the time that you intended to finish. Of
12 course, you were supposed to be finished --
13 MEMBER APOSTOLAKIS:We're losing time now.
14 VICE CHAIRMAN WALLIS: Okay. We are now
15 going to take a break until 2:15. We don't need the
16 reporter after that. We're going to go into safety
17 and security matters upstairs.
18 MEMBER SHACK: Should we meet here first
19 and then go up?
20 MEMBER APOSTOLAKIS: Yes.
21 VICE CHAIRMAN WALLIS: We'll meet here at
22 2:15, and we're now going to take this break, and we
23 don't need the transcript any more.
24 (Whereupon, the proceedings in the above-
25 entitled matter went off the record at 2:02 p.m.)

CERTIFICATE

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

Name of Proceeding: Advisory Committee on Reactor Safeguards 515th Meeting

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 Davis

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

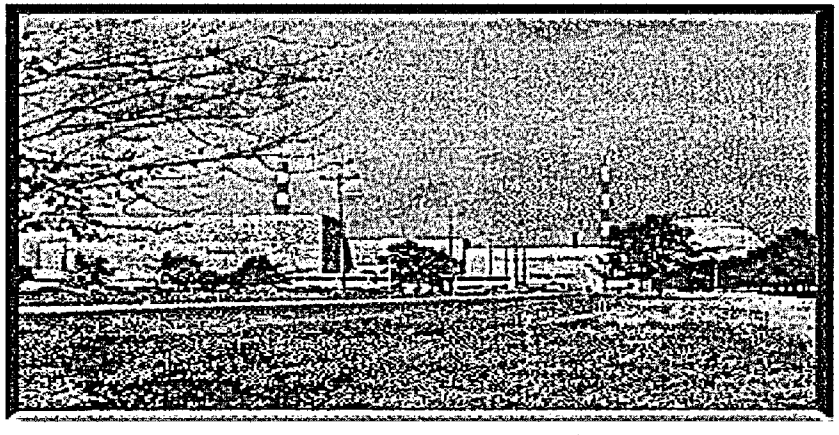
Exelon Nuclear

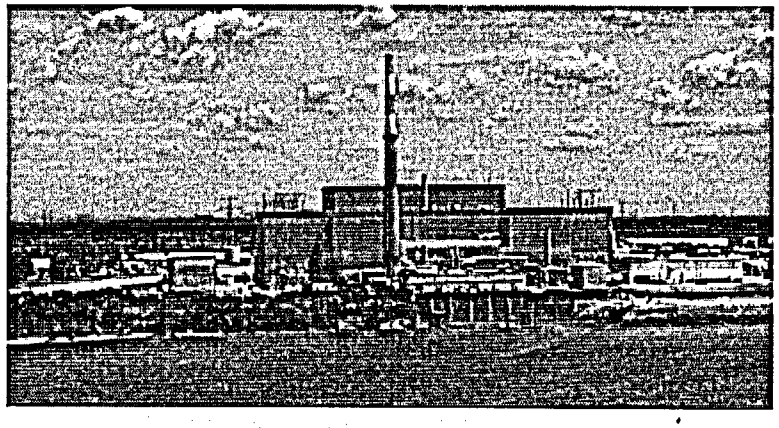
Dresden Nuclear Power Station
Quad Cities Nuclear Power Station

Presentation to
Advisory Committee on Reactor Safeguards

Exelon Nuclear

September 9, 2004





Agenda

- Plant Description - Bohlke
- Recent Operating Experience - Bohlke
- Major Equipment Replacements & Repairs - Stachniak
- License Renewal Commitments – Polaski

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
- Dresden Unit 1 is in SAFSTOR condition
  - A portion of the Unit 1 fire equipment supports Units 2 and 3 fire system and is in scope for license renewal

Recent Operating Experience

- All Reactor Oversight Performance Indicators for the four units are Green except for
  - Dresden Unit 3 HPCI Unavailability (White)
  - Dresden Unit 2 Unplanned Scrams (White)

Steam Dryer Replacement Plan

- New Quad Cities steam dryers planned for 2005
  - New design reduces stress concentrations, increases thickness, and transfers stress away from welds
  - The first dryer replaced will be instrumented to collect data

Steam Dryer Replacement Plan

- Exelon will conduct inspections of the new dryers during the subsequent refueling outage
- Pending the successful completion of the replacement plan, Exelon will not include the steam dryers within the scope of license renewal

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)
- Hydrogen water chemistry, zinc injection, and noble metals injection applied
- Core shroud repairs

Core Shroud Repair Hardware

- Shroud repairs installed in 1995-7 to structurally replace horizontal core shroud welds
- Repair hardware designed for 40-year life
- Materials included austenitic alloy XM-19 (tie rod), INCONEL X-750, and low carbon Type 316L stainless steel
- Materials were selected for resistance to IGSCC and IASCC
- Vertical shroud welds and shroud repair hardware are inspected per BWRVIP-76

Future 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

Commitment Management

- Exelon's commitment tracking system is controlled by a process 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

License Renewal Commitments

- Each Aging Management Program has a unique commitment tracking number
  - Implemented through procedures, work requests and surveillances
  - Aging effects, detection, and inspection criteria
- Implementing steps are annotated as license renewal commitments and are tracked on a station specific basis

Aging Management Program Implementation

- All procedures, work requests, and periodic surveillances that implement aging management programs will be in place by December 2004

- NRC Region III follow-up inspection of aging management programs concluded that program commitments were accurately tracked

Presentation Summary

ACRS License Renewal Full Committee

Dresden and Quad Cities Nuclear Power Station License Renewal Application

September 9, 2004

TJ Kim
Senior 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 912 and 795 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 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
- Follow-up to Third Inspection
  - May 25, 2004

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.
- AMP Audit Report issued April 23, 2004.

NRC Review Results

- 5 Open Items – all resolved
- 16 Confirmatory Items – all resolved
- Resolution of Open and Confirmatory Items brought into scope and subjected to AMR
  - Several new systems and components
- 4 new AMPs

Open Item

Scoping and Screening Methodology

- 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 eliminated the 20 ft exception and as a result expanded the license renewal boundaries of 17 plant systems and added 5 non-safety systems to the scope of the license renewal.

Steam Dryers/EPU

- **Steam dryers are generally not in scope for license renewal according to the rule.**
- **Resolution – The applicant has committed to a program plan that will identify the mechanism that has been causing unacceptable steam dryer loads and subsequent loose parts. This is being reviewed by the staff as a current operating reactor issue.**
- **Committed to 10 CFR 54.37(b)**

  After the renewed license is issued, the FSAR update required by 10 CFR 50.71(e) must include any systems, structures, and components newly identified that would have been subject to an aging management review or evaluation of time-limited aging analyses in accordance with § 54.21. This FSAR update must describe how the effects of aging will be managed such that the intended function(s) in § 54.4(b) will be effectively maintained during the period of extended operation.

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 and piping supports.
- Resolution – The applicant has committed to perform IWF-2500 for MC supports.
- Resolution – The applicant has committed to perform the same type and quantity of inspections as required by IWF-2500. Structures Monitoring Program has been revised accordingly for MC piping supports.

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

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	53	54	53	56
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.
- **Open Item Resolution – Applicant prepared a plant specific equivalent margin analysis (EMA) and demonstrated a minimum USE value of 32.4 ft-lbs. meets the criteria of Appendix K, Section XI of the ASME Code. Since 34 ft-lbs exceeds the minimum value, this weld meets the margins of safety against fracture equivalent to those required by Appendix G, Section XI of the ASME Code.

Reactor Vessel USE For Plates

Reactor Vessel Limiting Beltline Material	Capsule	Material	Capsule Neutron Fluence (N/cm²)	% Drop in Capsule USE	1/4 T Neutron Fluence at EEOL (N/cm²)	Projected % Drop at EEOL	USE at EEOL (Ft-Lbs)
Dresden Unit 2 Plate	3	A 302B	1.3×10^{16}	8	3.9×10^{17}	17.5	53
	8	A 302B	5.2×10^{16}	10		16	54
Dresden Unit 3 Plate	13	A 302B	9.3×10^{15}	4	3.9×10^{17}	11	57
	6	A 302B-M	2.9×10^{16}	6		15.5	54
	18	A 302B-M	7.1×10^{16}	7		11	57
Quad Cities Unit 1 Plate	G2	A 302B	1.03×10^{16}	7	2.9×10^{17}	16.5	53
	8	A 302B	5.5×10^{16}	10		15	54
Quad Cities Unit 2 Plate	13	A 302B	1.69×10^{16}	4	2.9×10^{17}	12	56
	18	A 302B-M	6.6×10^{16}	6		9	58

Reactor Vessel USE For Welds

Reactor Vessel Limiting Beltline Material	Capsule	Material	Capsule Neutron Fluence (N/cm²)	% Drop in Capsule USE	1/4 T Neutron Fluence at EEOL (N/cm²)	Projected % Drop at EEOL	USE at EEOL (Ft-Lbs)
Dresden Unit 2 Weld	3	ESW	1.3×10^{16}	7	3.9×10^{17}	18.5	49
	8	ESW	5.2×10^{16}	9		16	50
Dresden Unit 3 Weld	13	ESW	9.3×10^{15}	7	2.9×10^{17}	21.5	47
	6	ESW	2.9×10^{16}	9		16	50
	18	ESW	7.1×10^{16}	11		15	51
Quad Cities Unit 1 Weld	G2	ESW	1.03×10^{16}	5	2.9×10^{17}	18.5	49
	8	ESW	5.5×10^{16}	12		12	52
Quad Cities Unit 2 Weld	13	ESW	1.69×10^{16}	15	3.9×10^{17}	32	40
	18	ESW	6.6×10^{16}	28		43	34

Staff Conclusions

- 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 as stated in 10 CFR Part 54.
- The applicable requirements of 10 CFR Part 51 have been satisfied.

LICENSE RENEWAL PROGRAM IMPROVEMENTS

Jimi T. Yerokun

September 9, 2004

Assessment of the Scoping and Screening Review Process

- Assessment Objectives
  - Assess Completeness, Duplications and Overlaps
  - Develop Recommendations for Improvement

- Assessment Constraints
  - Maintain Complete Review
  - Develop Sound Staff Positions

Assessment Results

- Complete Review
  - Licensing and Inspection
  - Review of Methodology, Results and Implementation
- Duplication of Efforts
  - Audit/Inspection Sample Selection
  - Safety Reviews of 54.4(a)(2) and Unique Systems
- Program Documents
  - Enhancements

Recommendations

- Coordination and Communication
  - Audit and Inspection Samples
  - 10 CFR 54.4(a)(2) and Unique Systems
  - Guidance Documents
- Others
  - Combination of Inspections
  - Regional Center of Excellence
  - Dissemination of Lessons Learned
- Implementation Plan

Scoping and Screening Reviews Sampling Approach

- Scope of Sampling
- Sample Selection
- Implementation of Sampling Approach

Scope of Sampling Approach

- Plant Systems Branch, DSSA, NRR
- Auxiliary Systems and Steam & Power Conversion Systems
- 10 CFR 54.4(a)(1) and 10 CFR 54.4(a)(2) Systems
- Complementary to Methodology Audit

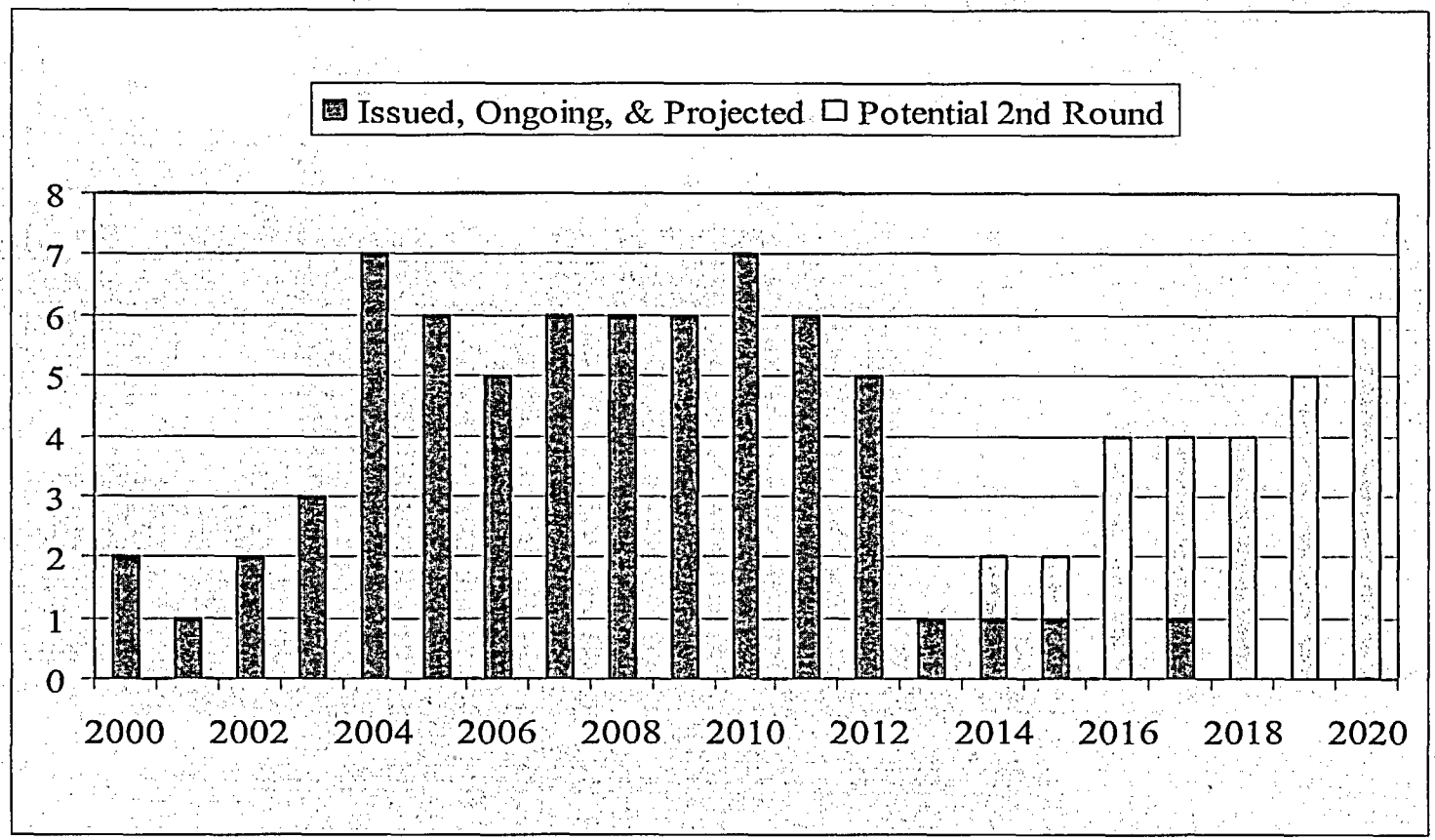
Sample Selection

- Smart Sampling
- Inherent Risk
- LRA Review Experience
- Non-Random
- Greater than 50%

Conclusion

- Improved Effectiveness and Efficiency
- Provide Reasonable Assurance

Renewed Licenses Issued (by Site)



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Assumes 2nd round applications will be submitted 3 years into renewal term.

Proposed Technical Specifications for Ensuring Steam Generator Tube Integrity

on

Advisory Committee for Reactor Safeguards
September 9, 2004

Louise Lund, Section Chief
Materials and Chemical Engineering Branch
Division of Engineering
Office of Nuclear Reactor Regulation
301 415-3248

Background

- Staff initiative for a revised regulatory framework has evolved over time.
  - Rulemaking
  - Generic Letter
  - Consideration of industry's NEI 97-06 initiative
  - Review of NEI SG Generic License Change Package (GLCP)
  - Review of lead plant submittals
    - Farley 1 and 2
    - Catawba 1 and 2

Background

- 12/06/2001 - Most recent ACRS Briefing on this topic
  - NEI 97-06, "Steam Generator Program Guidelines
  - NEI SG GLCP
  - Issues still to be resolved
  - Risk considerations

Proposed Technical Specifications for Ensuring Steam Generator Tube Integrity

Advisory Committee on Reactor Safeguards
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Summary - Bottom Line

- Industry has submitted a Generic License Change Package (GLCP) for NRC staff review and approval.
  - The GLCP proposes a new set of technical specifications (TS) incorporating largely performance based requirements for ensuring steam generator (SG) tube integrity.
- The staff and industry have reached resolution of outstanding issues regarding GLCP.
- A lead plant TS amendment package has been submitted for Farley Units 1 and 2 based on the GLCP and incorporating the above resolutions.

Summary - Bottom Line (Continued)

- The staff expects to complete its review of the Farley amendment by September 17, 2004.
- New TS modeled on the GLCP will address shortcomings of current TS and will ensure tube integrity.

Background

Current TS requirements for SG inspection and repair are prescriptive and out of date.

- Requirements not focused on key objective of ensuring tube integrity for entire period between inservice inspections.

Licensees have taken actions beyond minimum TS requirements to ensure SG tube integrity is maintained.

- Industry guidelines, including NEI 97-06

Key Issues Addressed (Since 12/06/2001)

- SG inspections/inspection intervals
- Clarification of structural integrity performance criteria with respect to non-pressure loadings
- Performance criteria, tube repair limits, and tube repair methods must be directly specified in TS

- Focus shifted from GLCP submittal to lead plant submittals to expedite resolution of issues

Proposed Technical Specifications

- Revised LCO Spec for operational leakage: 500 gpd to 150 gpd
- New LCO Spec, "Steam Generator Tube Integrity"
- New administrative technical specification, "Steam Generator Program"
  - Replaces existing administrative spec, "Steam Generator Surveillance Program"
- Revised administrative technical specification, "Steam Generator Tube Inspection Report"

New LCO Spec - SG Tube integrity

- The proposed LCO ties SG operability directly to maintaining tube integrity
  - instead of tying it to simply completing specified inspections (involving a specified inspection sampling plan at a specified frequency, and plugging or repairing all tubes satisfying the tube repair criteria) as is currently the case.

New Admin Spec - SG Program

- An SG Program shall be established and implemented to ensure SG tube integrity is maintained. In addition, the SG Program shall include:
  - Tube integrity performance criteria
  - Provisions for condition monitoring
  - Tube repair criteria
  - SG tube inspections
  - Provisions for monitoring operational leakage

New Admin Spec - SG Program

- Performance Criteria for Tube Integrity
  - Structural Criteria
  - Accident Leakage Criteria
  - Operational Leakage Criteria
- Attributes - Performance Criteria
  - Measurable, tolerable
  - Consistency with current licensing basis
  - No increase in risk

New Admin Spec - SG Program

Structural Integrity Performance Criteria

- Safety Factor (SF) of 3 under normal operating pressure differential
- SF of 1.4 under DBA pressure differentials
- SF of 1.2 under combined pressure and non-pressure primary DBA loads and 1.0 for axial secondary loads

New Admin Spec - SG Program

Accident Leakage Performance Criteria

- DBA leakage shall not exceed values assumed in the accident analysis.
  - To ensure acceptable dose consequences.
- DBA leakage shall not exceed 1.0 gpm (all SGs).
  - Leakage beyond this value may potentially increase risk under severe accidents.
  - Need to be risk informed.

New Admin Spec - SG Program

Operational Leakage Performance Criteria

- As specified in the LCO spec (150 gpd)

New Admin Spec - SG Program

Condition Monitoring

- The as-found condition of tubing shall be evaluated during each outage tubes are inspected, repaired, or plugged to confirm the performance criteria are met
- If one or more of the performance criteria not met, this is reportable in accordance with 10 CFR 50.72/73

New Admin Spec - SG Program

- Tube repair criteria
  - Tubes with flaws found by inspection to exceed 40% of the nominal tube wall thickness shall be plugged.
  - [Currently approved alternate repair criteria]
- Tube repair methods
  - [Currently approved repair methods]

New Admin Spec - SG Program

SG Tube Inspections

- Inspection scope, methods, and frequency shall be such as to ensure that SG tube integrity is maintained until the next scheduled inspection.
- Inspection scope and methods shall be performed with the objective of detecting flaws of any type that may exist from tube end to tube end which may exceed the applicable tube repair criteria.
- Inspect 100% of the tubes at the first refueling outage.

New Admin Spec - SG Program

SG Tube Inspections (Continued)

- For Alloy 600 MA tubing, no SG shall operate for more than 24 EFPM or one fuel cycle (whichever is less) without being inspected.
- For Alloy 600 TT tubing, no SG shall operate for more than 48 EFPM or two refueling outages without being inspected.
- For Alloy 690 TT tubing, no SG shall operate for more than 72 EFPM or three refueling outages without being inspected.

New Admin Spec - SG Program

SG Tube Inspections (Continued)

- If crack(s) found in Alloy 600 TT or 690 TT tubing, the next inspection shall not exceed 24 EFPM or one refueling outage.

Future Actions

- Complete review of lead plant amendment requests
  - Including Farley 1 and 2 by September 17, 2004
  - South Texas 1 and 2
  - Catawba 1 and 2
- Complete review of GLCP submitted by NEI TSTF Traveler and issue draft SE for public comment
  - Once the SE is finalized, the CLIIP process can be used to expedite subsequent TS amendment requests

Future Actions

- The staff is preparing a draft Generic Letter, "Steam Generator Technical Specifications," which it expects to issue for public comment in early Fall 2004.
- The Generic Letter requests information regarding:
  - the program each licensee is implementing to ensure SG tube integrity
  - licensee plans for modifying their TS to reflect their program

Acronyms

LCO	Liming Condition for Operation
DBA	Design Basis Accident
EFPM	Effective Full Power Months
MA	Mill Annealled
TT	Thermally Treated
TSTF	Technical Specification Task Force
SE	Safety Evaluation
CLIIP	Consolidated Line Item Improvement Program