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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

March 16, 2006

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This transcript has not been reviewed, corrected and edited and it may contain inaccuracies.

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS (ACRS)

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MEETING OF THE SUBCOMMITTEE ON POWER UPRATES

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THURSDAY,

MARCH 16, 2006

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The meeting was convened in
Cabinet/Judiciary Suite of the Hyatt Regency Hotel,
Bethesda, Maryland, at 8:30 a.m., Dr. Richard
Denning, Subcommittee Chairman, presiding.

MEMBERS PRESENT:

RICHARD S. DENNING Chairman

JOHN SIEBER

GRAHAM B. WALLIS

OTTO L. MAYNARD

ACRS STAFF PRESENT:

RALPH CARUSO

SAM MIRANDA

1 NRC STAFF PRESENT:

2 PATRICK MILANO

3 PAUL PRESCOTT

4 GARRY ARMSTRONG

5

6 ALSO PRESENT:

7 MARK FLAHERTY Constellation Power

8 MARK FINLEY Constellation Power

9 JIM DUNNE Constellation Power

10 ROY GILLOW Constellation Power

11 DAVE WILSON Constellation Power

12 GORDON VERDIN Constellation Power

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A-G-E-N-D-A

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

8:30 a.m.

CHAIRMAN DENNING: We are now going to resume, this is the second day of the Subcommittee on Power Upgrades of the Advisory Committee on Reactor Safeguards.

And we can immediately move into the next presentation.

MR. FINLEY: Mark Finley, Ginna.

The next piece of our presentation is in the operations and training area. And I'd like to introduce Roy Gillow to cover that topic.

MR. GILLOW: Good morning.

When Mark asked us to give us a brief résumé of our experience, I'm coming on about 30 years of nuclear power, which kind of makes me feel really old. So the 30 years kind of breaks down like this: Six years in the nuclear Navy and 24 years at Ginna. At Ginna I came up through the operations rank: auxiliary operator, control room operator, shift manager. I'm current shift manager and SRO at Ginna.

Today we're going to look at operations, EPU and operations, the human factors, the training that's planned, the overall testing that will go on

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1 for the ascension and the special emphasis in large
2 transient testing we plan.

3 Operations and testing. Procedures we
4 identified, which was 125 procedures that needed
5 changing for uprate, most of these are relatively
6 minor changes, setpoints. However, there's some
7 major procedure changes really identified by the PRA
8 people that had to do with decay heat removal,
9 especially in an Appendix R scenario. Our heat sink
10 and inventory control had to be changed, our
11 procedures had to be changed to enhance the time
12 line. We did this by two ways: Modifications and
13 streamlining procedures.

14 Also had a few selected EOP changes.
15 We'll go over those that needed major changes.
16 Again, decay heat removal was the major contributor.

17 Due to decay heat increased from EPU,
18 several actions required more restrictive times for
19 several key actions. As we mentioned, the charging
20 in Appendix R and establishment of aux feedwater for
21 the heat sink where the prime ones. Procedure
22 enhancements in addition to plant modifications
23 improved these key parameters.

24 In emergency operating procedures, our
25 function restoration, FR-H.1, which is the heat

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1 sink, we had to resequence the procedure to use
2 standby aux feedwater prior to attempting the use of
3 other feedwater sources. Prior to EPU we tried to
4 get condensate grade feedwater to the steam
5 generators. PRA identified there wasn't enough time
6 to do the actions to get condensate grade water, so
7 we went to standby aux feedwater.

8 Normal shutdown and start up procedures
9 will include additional guidance and resequencing to
10 account for plant modifications, place O-E
11 information in and reduce known operator concerns
12 such as hotwell skewing.

13 In emergency operating procedures
14 resequencing to use to standby aux feedwater we
15 talked about. Those kinds of things will be
16 incorporate in a training. The training will be a
17 major part of the operations readiness for the post-
18 refueling EPU operations. Operator training
19 consists of classroom and simulator. Classroom
20 training is ongoing with topics such as introduction
21 to EPU, which has already started in fall 2005.
22 Additional topics that have been covered are relaxed
23 axial offset, turbine modifications and licensing
24 changes.

25 Topics are overall two full cycles of

1 operator training are planned consisting of 16 hours
2 of classroom and 16 hours of simulator for each
3 cycle.

4 CHAIRMAN DENNING: What's the status of
5 the simulator? Has the simulator already been
6 modified to be able to --

7 MR. GILLOW: We're in the final
8 processes of modifying the simulator for EPU. All
9 the changes, modifications will be loaded and our
10 best guess of all the plant parameters will be
11 loaded in.

12 CHAIRMAN DENNING: And there will be a
13 period of time when the simulator can handle both
14 current and EPU --

15 MR. GILLOW: Correct.

16 CHAIRMAN DENNING: -- somehow by --

17 MR. GILLOW: We'll do some extensive
18 validation on EPU procedures and work on the
19 simulator. AT the same the operating shifts will
20 still be going through the normal plant parameters.
21 The last two cycles the shifts will go through EPU
22 parameters only. But, yes, there will be a certain
23 amount of time where we can use the simulator both
24 for, there will be an EPU simulator and the current
25 plant LOCA simulator

1 CHAIRMAN DENNING: But at this point you
2 haven't actually done anything with the simulator
3 that would indicate the behavior of the plant with
4 the simulator and the people in training because the
5 simulator just isn't done yet?

6 MR. GILLOW: We have all the plant --
7 the final things that are getting loaded into the
8 simulator are best guesses for the behavior of the
9 core. And the simulator in May will be ready for
10 validation and testing at EPU.

11 MEMBER SIEBER: You're going to have to
12 change some meter faceplates?

13 MR. GILLOW: Right. For the temporary,
14 for the interim period we're just going to put
15 temporary meter facing with scaling changes. And,
16 of course, the computer will have the correct inputs
17 for that scaling.

18 MEMBER SIEBER: So to switch from pre-
19 EPU to post-EPU you just take those temporary --

20 MR. GILLOW: Right. They'll take those
21 temporaries off. Right. Right. They did that when
22 they trained -- they had a contract for a while to
23 train people from overseas, and that's how they
24 handled it with success there.

25 MEMBER SIEBER: Yes, that'll work.

1 CHAIRMAN DENNING: We're talking about
2 simulator upgrading modeling will include all major
3 emergency procedure sets. What we're planning in
4 training startup and shutdown, selected functional
5 restoration procedures and abnormal operating
6 procedures.

7 And the classroom will concentrate on
8 plant modification. We'll do Appendix R walkdown
9 changes. And we'll try to validate all our Appendix
10 R time critical steps when we're doing our walkdowns
11 on Appendix R systems. So we'll get some time
12 lines.

13 MEMBER MAYNARD: It looked like one of
14 those times for operator action on the Appendix R
15 was like 35 minutes.

16 MR. GILLOW: Right. Control complex
17 fire 35 minutes to restore charging. That's really
18 what the Appendix or the PRA was talking about. We
19 put two plant modifications in to help relieve that
20 time line and we streamlined our ER Fire 1
21 procedures to make that the operator makes that time
22 line.

23 MEMBER MAYNARD: Okay. It looked like
24 or you said that it demonstrated you'd have it done
25 within 30 minutes?

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1 MR. GILLOW: The new number will be like
2 24 minutes. Currently we're doing in about 24
3 minutes without the modifications or streamlining
4 the procedures. So we're confident that we'll be
5 well under the 24 minute time line.

6 MR. FINLEY: Mark Finley. Just to
7 interject, there are two times that I think that
8 were discussed in the safety evaluation. One was 35
9 minutes, which was to restore aux feedwater for
10 steam generator water and the second time was, as
11 Roy said, to restore charging for pressurizer level.
12 That was the shorter time; 24 minutes.

13 MR. GILLOW: Yes. The current time to
14 restore charging is like 36 minutes and it's gone to
15 24 for those reasons that we had to streamline the
16 procedures and provide modifications. And we're
17 confident. We've done preliminary walkdowns. We're
18 going to be well under the time limits with the
19 modifications.

20 Any questions?

21 Testing. We're going to do post-
22 modification testing. There's a considerable amount
23 of our applications in. Do our normal low power
24 physics testing.

25 We're going to do plan a lot of steady

1 state data reviews. There's a considerable number
2 of stop points in the overall ascension to do state
3 data.

4 Transient testing and vibration monitor.

5 One thing that's not listed onto there
6 is the turbine governor belt testing. And we're
7 going to do a 100 percent data review in surveys,
8 that's radiation surveys.

9 CHAIRMAN DENNING: Before you go any
10 further like me ask you some questions about the
11 performance of the plant under transient conditions,
12 and particularly pressurizer level control.

13 MR. GILLOW: Okay.

14 CHAIRMAN DENNING: Because I understand
15 you have experience in this. In the current design
16 at the current level are there any conditions under
17 which you have trouble with pressurizer level
18 control and do you anticipate that at the uprated
19 condition there's some scenarios that are going to
20 be a problem and is it a concern?

21 MR. GILLOW: Okay. At our current
22 condition our current Tavg is 561. We certainly
23 don't have any pressurized level controls trip or
24 any other -- current pressurizer level band is 35 to
25 50. And, no, we don't have any challenges there.

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1 I don't expect any on the EPU. Our T
2 average is essentially the T average we had in '96,
3 which we had 573.5. We're going to 574, so it's
4 really a negligible change in no load -- or full
5 load T average.

6 We did go through to lower pressurizer
7 level on trip, but we had plenty of pressurizer
8 level indication on trip from '96 back. So I
9 wouldn't expect that we'll see any real difference
10 than we saw pre '96 of T average.

11 CHAIRMAN DENNING: Thanks.

12 MR. GILLOW: Okay. Transient testing is
13 probably the most operational challenge. Our plant
14 has to do the most benign tests first. The tests
15 we're planning to do is +/-5 percent steam generator
16 level changes. And then after that go into our
17 ramp, a 10 percent ramp change of one percent a
18 minute from 30 down to 20 percent, back to the 30
19 percent.

20 My idea when I selected the test was to
21 make sure that the steam generator level system
22 works and then the 10 percent will indicate the rod
23 system is working, the pressurizer level system is
24 working, the Tavg system is working. And that gives
25 you good feeling when you do the trip test. The only

1 thing left is the steam pumps.

2 Thirty percent test area gives a lot of
3 integration of all the systems, and everything
4 that's been changed with uprate will be tested under
5 these tests, these three tests. And, of course,
6 we're going to do control valve stroking at 46
7 percent.

8 CHAIRMAN DENNING: Why not do a turbine
9 trip from operating power?

10 MR. GILLOW: From?

11 MR. WOOD: From operating power, the new
12 operating power --

13 MR. GILLOW: From 100 percent?

14 MR. FINLEY: We actually have a slide.

15 MEMBER WALLIS: I think we talked about
16 that.

17 MR. GILLOW: Yes. The reason that we
18 really thought 30 percent trip, it really gives you
19 more integration of all the systems. When you trip
20 at 100 percent power, the rods go in, everything
21 goes to no low T average. You don't see the
22 integration of the rod control, the steam dumps,
23 pressurizer level as you -- you know, it doesn't
24 really show the full integration of the systems. The
25 30 percent, really, you got a bigger power mismatch

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1 because the reactor doesn't trip. Reactor trips for
2 us at 50 percent on a turbine trip. So you really
3 see a lot more of the system responses than you do
4 if you do a 100 percent trip.

5 MEMBER WALLIS: On the previous slide
6 you have a step wise escalation of power. Do you
7 have some criteria that tell you when you're
8 satisfied that things are okay and you're ready to
9 make the next step?

10 MR. GILLOW: Yes. And all the 100
11 percent power, which is I assume you're looking at
12 this slide here?

13 MEMBER WALLIS: Yes.

14 MR. GILLOW: At 85 percent, which is
15 right at 100 percent power, we're planning on 3
16 percent escalation a day, taking the various data
17 sets vibrations. Then there will be a convening of
18 management meeting that approves the next 3 percent
19 the following day. So we're going to do it in 3
20 percent increments a day --

21 MEMBER WALLIS: So it's primarily
22 vibration you're looking for?

23 MR. GILLOW: That's a huge part of it,
24 but there's also additional data that we're going to
25 take data sets.

1 Jim?

2 MR. DUNNE: Yes. This is Jim Dunne.

3 We're also going to be looking at
4 process conditions in the primary and secondary side
5 of the plant to make sure that the values that we're
6 seeing are consistent with what we expected to see
7 at power level.

8 MEMBER SIEBER: I presume you're going
9 to be running flux maps at these steps, too, right
10 or are you?

11 MR. VERDIN: Yes. This is Gord Verdin.

12 We plan to do pretty much our standard
13 physics testing and power ascension testing. We do
14 have to do a flux map before 50 percent power. We'll
15 do another one at the 85 percent power plateau for
16 incore/excore calibrations.

17 I'm not certain we'll end up doing flux
18 maps at each one of those plateaus just because
19 we're not really expecting any problems and if the
20 first flux map shows that there's not an issue. So
21 we will obviously. And then we do perform flux maps
22 again once we get to full power equilibrium Xenons.

23 MR. GILLOW: Any questions?

24 CHAIRMAN DENNING: So when you say 3
25 percent a day, that means that in a week --

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1 MR. GILLOW: The final 15 percent will
2 take five full days to accomplish. And, you know,
3 just trying to ensure that we get time to evaluate
4 data, do the vibration monitoring and get full
5 management approve that we're good for another 3
6 percent power increase. Of course, we have fuel
7 preconditioning in there, too, that's slow anyway.

8 MEMBER MAYNARD: Well that'd basically
9 be your minimum time, right?

10 MR. GILLOW: Right.

11 MEMBER MAYNARD: I mean if any issues,
12 questions or anything come up --

13 MR. GILLOW: Right. IF anything doesn't
14 meet acceptance or criteria, then we're going to
15 have to do evaluations on whatever.

16 CHAIRMAN DENNING: When you do this do
17 you have predicted in advance what -- well, let's
18 talk about vibration first.

19 MR. GILLOW: Okay.

20 CHAIRMAN DENNING: It sounds like you
21 really haven't determined exactly where monitors are
22 going to be placed.

23 MR. GILLOW: Yes, they did the walkdown
24 the last week, and that's really what is probably
25 going to be predictive of where we're going to place

1 monitors. Obviously on the main steam and main feed
2 outside containment, I think we're really committed
3 to monitor those heavily. But the other process
4 lines, especially the smaller ones off the main
5 lines, that's going to be determined I think by the
6 walkdown that's been --

7 CHAIRMAN DENNING: Okay. Now as far as
8 that, how are you going to determine what the level
9 is that is an acceptable level of vibration, for
10 example? I presume that in the power ascension plan
11 there are going to be some criteria. And if you
12 exceed that, then you have to stop --

13 MR. GILLOW: Do evaluation or do a
14 modification essentially.

15 CHAIRMAN DENNING: -- and do an
16 evaluation? Yes. How are you going to determine
17 what that level is on vibration?

18 MR. FINLEY: This is Mark Finley, Ginna.

19 We plan to do both visual inspections
20 and handheld accelerometer type data collection.
21 And we plan to use the criteria consistent with, I
22 believe it's OM-3 code and apply that. Using the
23 visual inspections we will look for a displacement
24 that exceeds one eighth of an inch. And if we have
25 anything that exceeds one eighth of an inch, we will

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1 evaluate that further.

2 CHAIRMAN DENNING: There is a standard,
3 you say, that applies to this?

4 MR. FINLEY: Yes. There is an operating
5 standard that applies to this.

6 CHAIRMAN DENNING: And this is something
7 that's recognized by the NRC?

8 MR. MILANO: Yes, it is. Yes. The
9 operations and maintenance code would then within
10 ASME. And it's OM-3.

11 MR. GILLOW: Any questions?

12 MEMBER WALLIS: Is it possible to have
13 pressure fluctuations of sort of the organ pipe type
14 that doesn't really lead to much displacement of
15 the pipe but there's a considerable amount of
16 pressure fluctuation in the pipe itself: It's
17 playing a musical note very loudly?

18 MR. GILLOW: I assume you're talking
19 like resonance?

20 MEMBER WALLIS: Yes, that sort of thing.
21 Yes.

22 MR. GILLOW: When we have resonance, we
23 usually hear. You get a visual, an audio --

24 MEMBER WALLIS: So what's your threshold
25 for --

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1 MR. GILLOW: I don't know if we have a
2 threshold, but we're certainly planning walkdowns
3 that would recognize that we have a resonance
4 problem.

5 MR. DUNNE: This is Jim Dunne.

6 Basically, you know, the operations
7 staff as they do walkarounds on a daily basis pretty
8 much know what the normal noise levels are. And if
9 all of a sudden they start hearing noise levels that
10 are different, they usually let engineering know
11 about it, write a condition report and force us to
12 go out and assess it and determine whether there are
13 any concerns with it.

14 So if there were obvious changes in the
15 noise levels, the operations staff would probably
16 pick that up in their walkarounds. And, hopefully,
17 the engineering walkarounds for the visual vibration
18 would also pick it up. And that would be something
19 that would be noted on the walkaround. And then we
20 would have to evaluate what it meant going forward
21 as to whether we thought it was an issue or not.

22 MR. GILLOW: Okay. I think we've
23 handled that through our standard technical
24 evaluation process.

25 MR. DUNNE: Yes. For example, a couple

1 of years ago we changed an internal feed reg valve.
2 And coming out of that outage the noise level
3 emanating from the valve was different than what
4 operations was used to. So they wrote actually a
5 condition report to engineering for us to evaluate
6 to determine whether we thought there were any
7 adverse consequences due to the new noise level. It
8 was about cavitating madly and there was a potential
9 for cavitation down the stream to the valve.

10 CHAIRMAN DENNING: Would you have a
11 limit, for example on moisture carryover?

12 MR. DUNNE: WE're not going to monitor
13 moisture carryover. To do moisture carryover in a--
14 unlike a PWR or a BWR, we can use the primary site
15 isotropic composition to assess moisture carryover.
16 We don't really have that on the PWR to do that. We
17 have to do a special test. Typically those tests
18 are very time consuming and require a lot of
19 planning. Usually it's a sodium 24 tracer test,
20 which has a relative short half life.

21 So, for example, when we did steam
22 generator replacement in 1996 we did a moisture
23 carryover test as a performance warranty type of
24 test because of the aggressive design requirement we
25 had on moisture carryover. We went from .25 percent

1 with the original generators down to 0,1 percent and
2 we wanted verification that these new separators
3 were actually doing that. So we did do a moisture
4 carryover test.

5 Now the actual setting up the procedures
6 and coordinating the logistics and getting the
7 sodium tracer isotope in from a university in
8 Missouri and getting into the plant basically was a
9 very involved process. It took us about three months
10 after we came up before we were ready to do the
11 test.

12 Based upon the full scale model testing
13 that B&W Canada has done on their steam separator
14 modules, we're well within the bounds as to what
15 they have tested these units at. And since our
16 visual moisture carryover test from the replacement
17 generator basically showed results better then and
18 are equal to what their laboratory results showed,
19 we feel reasonably confident that moisture carryover
20 values will be consistent with what their full scale
21 testing. And there's no need for us to go in and do
22 a moisture carryover test, per se.

23 MR. MILANO: Mark, you know yesterday
24 you talked, maybe it would be good to reiterate what
25 you talked about yesterday in terms of your baseline

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1 testing for both displacement in vibration and stuff
2 like that as a precursor to having a baseline level
3 at your current 100 percent and so that to evaluate
4 or correlate against as you go up to the new 100
5 percent.

6 MR. FINLEY: Right. Mark Finley, Ginna.

7 Yes. Roy had mentioned we did a baseline
8 walkdown two weeks ago and we're in the process of
9 evaluating that data. We'll come up with a set of
10 inspection points for the handheld accelerometer
11 taking based on that baseline walkdown. And we'll
12 also develop our complete list of visual inspection
13 points on that walkdown as well.

14 MEMBER WALLIS: I guess you've finished
15 your presentation?

16 MR. GILLOW: Yes, I think --

17 MEMBER WALLIS: Could I go back to the
18 boron precipitation measure? You said you made some
19 modifications to the emergency operating procedure?

20 MR. GILLOW: We know we have to make
21 modifications to --

22 MEMBER WALLIS: Right. Right.

23 MR. GILLOW: -- procedure. We haven't
24 completed those consistent --

25 MEMBER WALLIS: This is long --

1 MR. GILLOW: -- we don't know -- all
2 the ramifications of boron precipitation.

3 MEMBER WALLIS: This is long term
4 cooling.

5 MR. GILLOW: Right.

6 MEMBER WALLIS: And you have to meet
7 some criteria in parts per million or something like
8 that and you have --

9 MR. GILLOW: There will be some unit
10 that we have to provide upper plenum injection.

11 MEMBER WALLIS: Right. Some sort of
12 quantitative analysis that has some criterion for
13 success in terms of parts per million or some
14 measure?

15 MR. MILANO: This is going to be part of
16 our discussions when --

17 MEMBER WALLIS: So you're going to
18 discuss this?

19 MR. MILANO: We're going to discuss this
20 on April 27th --

21 MEMBER WALLIS: Oh, April 27th. Okay.

22 MR. MILANO: This is part of -- we're
23 going to be discussing three things.

24 MEMBER WALLIS: Okay. Because I was
25 interested in your reaction to this and your

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1 evaluation of the boron precipitation.

2 MR. MILANO: We're still not --

3 MEMBER WALLIS: Next month? Okay.

4 MR. MILANO: Yes, indeed.

5 MEMBER WALLIS: Okay. Thank you. All
6 right.

7 MR. GILLOW: I think we pretty much have
8 gone everything that I had. So if there's on other
9 questions, I'll introduce Mark Flaherty, Nuclear
10 Technical Service.

11 MR. FINLEY: I think before we --

12 MR. MILANO: We're a little ahead, so
13 what I'd like to do is rather than we've got our
14 human factors people that were going to talk after
15 the break, I'd like to do that first and then if
16 there aren't a lot of questions, maybe we'll go
17 right into related to power ascension and testing.

18 I'd like to introduce Garry Armstrong.
19 Garry's. Garry's from our operator license and Human
20 Performance Branch. And he's one of the Human
21 Factors Engineers.

22 MR. ARMSTRONG: Again, my name is Garry
23 Armstrong, and as Pat said, I'm a Human Factors
24 Engineer. And we review the human performance
25 aspects of the Ginna EPU.

1 Our areas of review that the human
2 factors folk look at are the programs procedures,
3 training and the human system interface design
4 features that are related to the operator
5 performance. And the purpose of the review is to
6 assure that the operator performance is not
7 adversely affected by the proposed EPU.

8 The regulatory criteria, as you see
9 listed there, many parts of it come from the Review
10 Standard, in which our areas fall under Matrix 11.
11 There are five areas that I will discuss later on in
12 the presentation. And the other regulatory criteria
13 is 10 CFR 50.120, 10 CFR Part 55, the Generic Letter
14 82-33 and the Standard Review Plan Chapter 19.

15 And the five areas that are listed in
16 Matrix 11 that we will discusses the changes that
17 are related to are:

18 The emergency and abnormal operating
19 procedures;

20 The changes for operator actions related
21 to the uprate;

22 The changes to the control room alarms,
23 controls and displays;

24 The safety parameter display system.

25 I'll refer to that as the SPDS, and;

1 The operator training programming and
2 control simulator.

3 The first area, the emergency and
4 abnormal operating procedures, we identified three
5 major changes to the procedures that we looked at as
6 far as the EPU. As Roy discussed earlier for Ginna,
7 they were going to streamline some procedures. The
8 main portion to streamline was going to come in the
9 E-O procedures, which is the standard post-trip
10 actions that the operator must take -- sorry.

11 And what that is doing is that the
12 automatic verification steps that are related to the
13 ECCS injection, those steps are going to be
14 relocated into an attachment in which a licensed
15 operator will perform those verification tasks in
16 parallel to the majority of the E-O procedure that
17 will be performed. Basically this will help the
18 operators to expedite through the E-O procedure
19 faster so that they'll be able to identify the
20 accident condition and get into those procedures
21 much faster. And this, like Roy said earlier, that
22 will just offset the effects of the increased decay
23 heat. So they're trying to build in more time for
24 the operator to be able to handle those other
25 mitigation tasks.

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1 MEMBER MAYNARD: Is this change unique
2 to Ginna or is this a fairly standard change that a
3 number of the Westinghouse PWR plants have made to
4 E-O?

5 MR. GILLOW: Yes. This is a MOG
6 initiative that many other plants have already gone
7 to this attachment.

8 MEMBER MAYNARD: Because I think that
9 this would be an applicable and beneficial not only
10 for EPU, but for even non-EPU conditions. I didn't
11 think this was unique. You weren't out on your own
12 writing E-O changes?

13 MR. GILLOW: That's correct. This is
14 Westinghouse Owners Group.

15 MR. ARMSTRONG: All right. And that
16 seques into the next procedure change that we
17 identified that would benefit from the revised E-O,
18 and which Roy mentioned earlier, the functional
19 restoration procedure in which the operator would
20 initiate the standby auxiliary feedwater once the
21 normal auxiliary feedwater cannot be established.
22 And this is related to the high energy line break
23 accident.

24 And finally, as discussed yesterday, the
25 plant modifications related to the Appendix R events

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1 will also be reflected in the procedure to enhance
2 the operator actions -- I mean the effectiveness of
3 the operator actions in those scenarios.

4 And all three of these areas, the
5 training for all three of these procedures will be
6 implemented prior to EPU.

7 Moving on to operator actions sensitive
8 to a power uprate, in identifying the changes that
9 the licensee submitted to us, mainly these are just
10 the areas that they identified that would have some
11 effect due to the increased decay heat. But overall,
12 there was minimal effect as far as any new actions
13 being introduced and any real times that will be
14 different from the times that they're already
15 achieving in their response times.

16 And example, jumping out to the third
17 bullet here. And we got into a little discussion
18 about this earlier in which one of the Appendix R
19 events would cause the dryout to be reduced from 50
20 to 35 minutes. And in our discussions with the
21 licensee the operator has already been able to
22 achieve establishing feedwater flow within 30
23 minutes. And so with the enhancements that they're
24 making to the plant as well as the procedure
25 changes, they will basically just ensure that they

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1 would make it faster than the 30 minutes and will
2 not take anymore than the 30 minutes needed.

3 MR. CARUSO: That change in the steam
4 generator dryout time seems much larger than would
5 be expected from a 17 percent power uprate. Do you
6 have any idea why it went from 50 to 35 minutes?

7 MR. ARMSTRONG: From our understanding,
8 that would be due to the increased effects of the
9 decay heat.

10 MR. FINLEY: This is Mark Finley.

11 You're correct, that changes a greater
12 percent than the 17 percent change in decay heat.
13 This is just a more conservative analysis that we've
14 done to establish the 35 minutes for EPU.

15 MEMBER WALLIS: But realistically it's
16 going to be more than that, isn't there? The dryout
17 time is going to be 40 something, realistically?

18 MR. FINLEY: Oh, that's correct. This is
19 a conservative analysis. We would expect the dryout
20 time to be longer than the 35 minutes.

21 MEMBER WALLIS: I just wonder why you
22 went to the extreme of being so conservative when
23 you used 50 before. Was that conservative, too, or
24 50 was not conservative?

25 MR. GILLOW: Fifty was conservative.

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1 MEMBER WALLIS: So you're even more
2 conservative now.

3 MR. GILLOW: Well, you have the decay
4 heat; that's going to drive it down some.

5 MR. DUNNE: In addition to the increased
6 decay heat, which will steam water off faster from
7 the generator, your initial water inventory for the
8 generator is a bit lower because of the change in
9 the circulation ratio. So you've got a slight
10 decrease in initial water inventory due to EPU at
11 full power and then you have the higher decay heat.
12 So both of those would cause your dryout time to,
13 obviously, move forward to an earlier time.

14 MR. ARMSTRONG: All right. Moving on.
15 As discussed earlier, the functional restoration
16 procedures is only interested on which the operator
17 action is done earlier in the procedure to basically
18 initiate the standby AFW flow. All right.

19 MEMBER WALLIS: Well, I'm surprised you
20 want to be conservative about steam generator dryout
21 time. Usually a hand calculation using an energy
22 balance does very well in predicting this. If you
23 look --

24 MR. CARUSO: I have a question, Graham.
25 How much of this had to do with the fact that you

1 moved the feedwater isolation valves closer to the
2 steam generator?

3 MR. FINLEY: Mark Finley.

4 None of this change in time had to do
5 with those valves. This is a fire scenario. It's not
6 a steam line break scenario.

7 MR. CARUSO:

8 MR. FINLEY: So the feed isolation
9 valves wouldn't be closing here.

10 MR. CARUSO: I'm sorry to interrupt,
11 Graham.

12 MR. ARMSTRONG: All the current operator
13 action times will be verified using the simulator
14 and plant with regard to the EPU. And as discussed
15 yesterday, we're still evaluating the operator
16 actions related to the small break LOCA analysis.
17 And that will be discussed next month.

18 CHAIRMAN DENNING: Is there any reason
19 to think that there is going to be any issue with
20 the small break LOCA or is it just that your review
21 isn't completed?

22 MR. ARMSTRONG: The review is not
23 complete at this time. Okay.

24 Moving on. The changes to the control
25 room, alarms, controls and display. In the submittal

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1 the licensee provided a listing of the different
2 parameters that would be effected by the EPU. I
3 didn't provide that list here. It's in the SE. And
4 the only new controls that we identified that they
5 were adding were just the two controls for the main
6 feedwater isolation valves. The main areas that the
7 EPU will effect are related to the instrument loops,
8 alarm, response procedures, plant process computer
9 system setpoints and the various controls and
10 control systems as far as their ranges.

11 The modifications will be completed
12 using the licensee's human factors review as well as
13 the operator's input. And the training on all the
14 modifications will be provided prior to EPU.

15 For the safety parameter display system,
16 the changes related to the EPU that the licensee
17 identified were the RCA subcooling monitoring to be
18 reduced, the condensate storage tank minimum
19 required level to be increased and the critical
20 safety function status trees to be reviewed and
21 revised. These changes also will be made prior to
22 EPU as well as the training.

23 And the last area, which relates to
24 operator training and the control room simulator,
25 the training will typically cover the plant

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1 modifications related to EPU as well as the
2 procedure changes, the startup test procedures and
3 the parameters and the setpoints and everything that
4 would be revised in the control room. Again, the
5 training, the simulator training will be implemented
6 prior to EPU. The simulator itself will be
7 validated against the inspected EPU responses and
8 the data from the startup tests.

9 The simulator fidelity will be
10 implemented in accordance with ANSI/ANS 3.5 1998
11 using the RETRAN program.

12 And as discussed earlier, the Appendix R
13 procedure changes involving the local manipulations
14 will be validated using the walkthrough simulations
15 in the field.

16 So our conclusion is that the Staff has
17 accounted for the effects of the proposed EPU on the
18 available time for operator actions and that they
19 have taken or will commit to take the appropriate
20 actions to assure that the operator performance is
21 not adversely affected by the proposed EPU.

22 The license continues to meet the
23 applicable NRC requirements related to human
24 performance.

25 and we find that the proposed EPU

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1 related to human factors acceptable except for, like
2 I say, we're still reviewing the small break LOCA
3 portion.

4 Okay. That's all I have. Any
5 questions?

6 CHAIRMAN DENNING: No. Thank you very
7 much.

8 MR. ARMSTRONG: Okay.

9 MR. MILANO: I think it's best if we
10 just continue right now.

11 CHAIRMAN DENNING: Absolutely. Yes.

12 MR. MILANO: I'd like to Paul Prescott.
13 He's from our Quality Assurance and Vendor Branch.
14 They have the full blown responsibility for
15 evaluating the power ascension and testing programs.

16 MEMBER WALLIS: Is there any guidance
17 about this, power ascension and test program for
18 PWRs? I think in the BWR case GE has a guidance in
19 their power uprate. Is there some guidance for PWRs
20 that states what sorts of tests are expected? Is
21 there a work guidance or an Agency guidance or
22 anything like that?

23 MR. PRESCOTT: Good morning.

24 MR. MILANO: Well, no. He's asking a
25 question as to whether -- before you get started in

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1 your presentation as to is there industry or vendor
2 guidance that's out there that would tend to give
3 you the basic principles of what's needed for a PWR
4 power ascension test?

5 MR. PRESCOTT: No. Unlike GE which had
6 ALTA01, which supplied very specific guidance on
7 what was required for what they possibly considered
8 was necessary for large transient testing, the WCAP
9 produced by Westinghouse does not have any such
10 guidance in its document. Okay.

11 Well, good morning. My name is Paul
12 Prescott. And myself along with Aida Rivera-Varona
13 from the Quality and Vendor Branch performed the
14 review of Ginna's proposed power ascension testing.

15 As was stated by Pat, the Quality and
16 Vendor Branch has overall responsibility for the
17 review. EQVA has overall responsibility for the
18 test program review along with the secondary review
19 branches that verify that their respective system
20 structures and components perform satisfactorily in
21 service.

22 As you're well aware, we looked
23 extensively at plant modifications and proposed
24 testing and the effects on normal operations as well
25 as abnormal operating occurrences.

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1 I won't go into a lot of detail about
2 the guidance of SRP 14.2.1. As you may recall, it
3 was only about a couple of weeks ago I was before
4 you gentlemen for a few hours discussing this review
5 that we do.

6 And I just want to say I appreciate Mr.
7 Denning's input that we're looking at that right now
8 for possible input into the guidance that we do.

9 So as the next slide shows, we looked at
10 operator training, as was just described by the
11 gentleman that was just up here, but we take another
12 look at it from an overall perspective.

13 We take a look at the modifications that
14 were performed in the post-modifications that are
15 proposed by the licensee. We also do a secondary
16 analysis that the codes were looked at by the
17 licensee and also by the Staff and the emergency
18 operating procedures that are proposed.

19 As you're well aware, the burden is on
20 the licensee to provide adequate justification for
21 all the Staff's areas of review. Other Staff
22 considerations are reduction in margin of safety,
23 vendor topical reports, we just discussed, and risk
24 implications.

25 The Staff did consider Ginna's response

1 to the RAIs and their overall response to the SRP to
2 be quite comprehensive.

3 As has been discussed already, Ginna
4 proposes to do a transient test, I won't call it a
5 large transient test, but a transient test to gain a
6 data point on the integrated plant response and that
7 the control system achieve a stable plant condition
8 following the transient that they plan to put on the
9 plant.

10 The big ticket items that they plan to
11 look at are pressurizer level and pressurizer
12 control, the steam generator level control, steam
13 dump control and rod control, as has been discussed.

14 MEMBER WALLIS: Excuse me. When they do
15 this 30 percent power trip, is there a large
16 quantity of steam bypassed to the condenser?

17 MR. FINLEY: That's correct.
18 Approximately 20 percent.

19 MEMBER WALLIS: Twenty percent.

20 MR. FINLEY: Yes.

21 MEMBER WALLIS: So you don't try to sort
22 of handle it all with the reactor system. You let
23 the steam go and --

24 MR. FINLEY: That's correct.

25 MR. GILLOW: That's part of the idea is

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1 to set the steam flow system and controls --

2 MEMBER WALLIS: Right. Right. Right.

3 MR. GILLOW: -- integrated with the rod
4 controls.

5 MEMBER WALLIS: And there has to be some
6 synthesis of all these things together?

7 MR. GILLOW: That's correct.

8 MEMBER WALLIS: Right.

9 MR. GILLOW: And that's really --

10 MEMBER WALLIS: That's what you're
11 testing?

12 MR. GILLOW: That's right.

13 MR. PRESCOTT: And if I'm not mistaken,
14 one of the requirements for a successful test is
15 that the reactor doesn't trip, is that correct?

16 MR. GILLOW: Right. That's a high level
17 acceptance criteria.

18 MR. PRESCOTT: Right. That should be a
19 high level acceptance criteria.

20 MEMBER WALLIS: Well presumably if you
21 just dumped all the steam, you just keep going and
22 keep dumping steam --

23 MR. GILLOW: Well, the rod control
24 system would bring the temperature back and the
25 steam dumps will shut off. That's really --

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1 MEMBER WALLIS: Yes, that's right.

2 That's what you have to do.

3 MR. GILLOW: Yes, right.

4 MEMBER WALLIS: But I mean you could
5 just keep dumping steam for a long time.

6 MR. GILLOW: Well, the integrated system
7 we'll stop dumping.

8 MEMBER WALLIS: Will stop that?

9 MR. GILLOW: We actually will keep
10 dumping steam because we're going to stop at 12
11 percent reactor power.

12 MEMBER WALLIS: Yes.

13 MR. GILLOW: To create a positive MTC.
14 We don't want to get close to going out of power
15 range.

16 MEMBER WALLIS: Yes, to shutdown.
17 Right.

18 MR. GILLOW: And then once we stabilize,
19 we can go ahead and reascend and resync on line and
20 go back to 30 percent level.

21 MEMBER WALLIS: I don't know, you don't
22 have it here, but it would sort of help if you would
23 indicate sort of a simulation of this. I mean, just
24 to have one picture or something of what happens to
25 the steam generator.

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1 MR. GILLOW: I actually have it in my
2 slides.

3 MEMBER WALLIS: What happens to the
4 pressurize level. Yes. Maybe next time or
5 something, or you can do it now.

6 MR. GILLOW: Well, I just got to satisfy
7 the --

8 MEMBER WALLIS: Show that there are
9 significant events happening that are challenging
10 things.

11 MR. GILLOW: Right. That's correct.

12 MR. FINLEY: Okay. Mark Finley.
13 Hopefully this will give you some sense. That first
14 slide at the top there shows nuclear power and
15 turbine load as a function of time. And, obviously,
16 initially there will be a rapid transient for
17 turbine load and that's creates the fairly large
18 power mismatch. And what's operating at this point
19 is the steam dumps will be opening and rods will be
20 driving into --

21 MEMBER WALLIS: Can you show us what the
22 pressurizer does?

23 MR. FINLEY: I think I have that in the
24 next slide. You can see before I go to the next
25 slide, average coolant temperature starts out

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1 increasing and then will decrease to a controlled
2 value.

3 And then for the pressurizer, we have
4 pressurizer pressure there and pressurizer level.
5 Pressurizer pressure increases initially due to the
6 average coolant temperature rise that I showed on
7 the previous slide, about 30 points is what we
8 predict. A little more than that.

9 MEMBER WALLIS: So the pressurizer level
10 doesn't change all that much, because there's a zero
11 somewhere down below?

12 MR. FINLEY: That's correct. The
13 pressurizer level, we don't expect to go up more
14 than a couple of inches there. I'm sorry. That's a
15 couple of percent.

16 MEMBER SIEBER: This is at a higher
17 power level than you'd --

18 MR. FINLEY: That's correct. This is at
19 30 percent, and this is the delta that we'd see
20 that.

21 Now for --

22 MEMBER WALLIS: You have a RETRAN
23 prediction of this or something like this you show
24 here, and you're going to see if it does what you
25 expect it to do, right?

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1 MR. FINLEY: That's correct.

2 MEMBER WALLIS: Right.

3 MR. FINLEY: That's correct. This is
4 actually LOFTRAN, but --

5 MEMBER WALLIS: It's LOFTRAN.

6 MEMBER MAYNARD: And would your results
7 be factored into any simulator modeling for future
8 training also?

9 MR. FINLEY: That's correct. And the
10 simulator.

11 MEMBER WALLIS: Well, I'm very glad you
12 had the backup slides because it's nice to see sort
13 of substance, not just words. Thank you very much.

14 MR. PRESCOTT: As we discussed a couple
15 of weeks ago, we have accepted justifications to now
16 performing large transient testing. And Ginna did
17 not have any, after review of their modifications
18 and the proposed testing program as compared to
19 their initial test program, there were no outliers
20 that points towards indications that large transient
21 testing was needed for code verification. They had
22 operating experience from Kewaunee. Kewaunee is
23 currently at a similar power level that Ginna will
24 reach from this EPU. And that was gone over with
25 the licensee.

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1 And as I said, their test program
2 monitored sufficiently the plant parameters that are
3 expected to change from the EPU.

4 So in summing this up we found that the
5 test program that the applicant proposes was quite
6 comprehensive. They actually were the ones that
7 proposed the 30 percent transient test that they're
8 going to impose on the plant to verify the
9 integrated plant response is adequate. And the
10 Staff had no outstanding issues concerned with the
11 test program.

12 CHAIRMAN DENNING: Did you look to see
13 what LOFTRAN results would have been for a trip from
14 100 percent to get a feeling as to what the
15 different challenges were to systems and total
16 system response? I mean, we've seen here a good
17 example of what the expectation is for the 30
18 percent manual trip.

19 MR. MIRANDA: This is Sam Miranda from
20 Reactor Systems and NRR.

21 That's the loss-of-the-electrical load
22 reported in Chapter 15?

23 CHAIRMAN DENNING: Yes. Okay. So
24 that's exactly what it looks like if we could look
25 all of the system response in that -- I mean, I

1 wanted to look at the transient system response. So
2 if we look at that particular accident --

3 MR. MIRANDA: Yes. Yes, you can find it
4 in the licensing basis in the FSAR Chapter 15. And
5 there's also an analysis in the applicant's license
6 amendment request.

7 CHAIRMAN DENNING: Thanks.

8 MEMBER SIEBER: But that would be quite
9 different than --

10 CHAIRMAN DENNING: Than this?

11 MEMBER SIEBER: Because the reactor
12 would trip and everything would basically try to
13 shut down.

14 MR. GILLOW: That's correct.

15 MEMBER SIEBER: As opposed to this kind
16 of a test --

17 MR. GILLOW: Yes. This shows the system
18 is really operating.

19 MEMBER SIEBER: -- 30 percent where
20 anything modulated.

21 MR. GILLOW: Everything goes to the no
22 load and you're really just as the mercy of how much
23 decay heat you have as far as steam valves or --

24 MEMBER SIEBER: That's all you're doing
25 is dumping steam and --

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1 MR. FINLEY: This is Mark Finley.

2 In addition to the Chapter 15 accident
3 analysis that Sam Miranda mentioned, we also did a
4 more realistic LOFTRAN simulation of a trip from 100
5 percent power just to give us a more realistic
6 feeling for what the control systems would do.

7 CHAIRMAN DENNING: Oh, yes. The
8 difference is the one is a regulatory analysis and
9 the other is a safety analysis?

10 MR. FINLEY: That's correct. And the
11 safety analysis doesn't credit action for non-safety
12 related equipment; spray for example.

13 MEMBER SIEBER: When you think about it,
14 a loss of load at 30 percent basically simulates how
15 the rest of the plant would operate if only DKE were
16 a contributor. And so the results you get are
17 roughly the same as a trip from 100 percent as far
18 as system response is concerned.

19 MR. GILLOW: Right. No, the difference
20 would be your rod control system will just go in, it
21 integrates back in and you'd close your steam
22 valves.

23 MEMBER SIEBER: Right. You're just
24 getting the heat from a different source.

25 MR. GILLOW: Right.

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1 CHAIRMAN DENNING: With regards to the
2 power ascension scheduling, is there past history of
3 similar uprates and how did the scheduling look like
4 there? I mean, like the three percent increase per
5 day, is that typical?

6 MR. PRESCOTT: Right. That's --

7 CHAIRMAN DENNING: Or are people taking
8 longer?

9 MR. PRESCOTT: No, that's pretty
10 standard. I would say I was the senior resident at
11 the Duane Arnold when they did their power uprate,
12 and this pretty much models what they did for their
13 power ascension and their levels of power that they
14 would go to and stop, and essentially baseline there
15 before they would move to the next level to get
16 data. So this was typical.

17 MEMBER SIEBER: This actually looks like
18 a startup test for a new reactor.

19 MR. PRESCOTT: Right. Very similar.

20 MEMBER MAYNARD: That's where you took
21 it from, mostly?

22 CHAIRMAN DENNING: What's the resident
23 inspector's role in this? I mean, obviously he's
24 there, but does he get involved at all in the
25 decision as to whether criteria have been met or not

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1 and the next day's power ascension?

2 MR. PRESCOTT: At the time that I was
3 the senior resident, they did not have a specific
4 inspection procedure on how to conduct how we should
5 -- it wasn't spelled out how we should perform our
6 function there. However, since that time it was
7 obviously deemed wise that we develop something. And
8 it has been developed. Now the specifics on that
9 procedure, I can't really speak to you. But I can
10 tell you that either my resident or myself were
11 there for the entire time just because, as you know,
12 Region III had at the time a differing professional
13 view that was put forward. And so therefore, there
14 was a lot of interest on power uprates, especially
15 in Region III. I can speak specifically for Region
16 III.

17 But even though we didn't have any
18 specific time cut out for it, we made time to
19 observe the entire power uprate.

20 MR. MILANO: I'd like to also bring in
21 there, I've been having discussions with our Region
22 I staff. And Region I plans to supplement the
23 resident inspector staff during the power ascension
24 testing. As Paul indicated, there is inspection
25 manual guidance now on power ascension testing. And

1 in each one of the plateaus, even though it's not a
2 hold point in terms of the NRC, there is an
3 expectation that once the licensee makes their
4 determination that they've met their objectives and
5 they plan to go up to the next power level, that
6 there will be a discussion. And there also is an
7 expectation that the supplemental NRC inspection
8 staff will then relay the information back to both
9 NRR and also to the regional management and
10 basically just concurrence with the fact that
11 they're going to go up to the next level.

12 MEMBER SIEBER: On the other hand, the
13 licensee has sole responsibility for the operation
14 of the station.

15 MR. MILANO: That is correct.

16 MEMBER SIEBER: And they would step in
17 if there's a violation of license conditions,
18 technical specifications or commitments, but not
19 detailed manipulation of the controls. The only
20 ones that are licensed to do that are the plant
21 operators.

22 MR. MILANO: In all reality, assuming
23 that they've met their test objectives, what we're
24 going to be probably interested in and want to have
25 discussions with is if they see something that's

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1 somewhat abnormal, let's say they start seeing a
2 higher vibration but they assess it to be adequate,
3 we'll probably want to, you know, just to make sure
4 that we're comfortable with it even though it's not
5 a violation of anything, any code limits or anything
6 like that.

7 MEMBER SIEBER: Well, the interesting
8 thing it depends on the component when you're
9 talking about vibrations. Things like throttle
10 valves and regulating valves are quieter at full
11 power than they are when they're partially closed.
12 The rotating machinery usually is its noisiest when
13 it's running flat out. The sound of the plant
14 changes depending on what power load you're at.

15 MR. PRESCOTT: Thank you, gentlemen.

16 CHAIRMAN DENNING: Thank you.

17 MR. MILANO: Well, that concludes the
18 presentations that are expected of the NRR staff.

19 I'd like to turn it back over to Mr.
20 Finley who is going to wrap up the licensee's
21 portion. And then after that, we can discuss
22 anything that came out of the last day and a half.

23 MR. FINLEY: Mark Finley.

24 I'd just like to introduce Mark Flaherty
25 once again to conclude for us.

1 MR. FLAHERTY: Okay. I've got a couple
2 of points up here in a slide to kind of summarize
3 what you've heard over the last day and half and
4 then also I have a couple of other points I'd like
5 to make.

6 There's been a lot of detailed and
7 comprehensive reviews with respect to this project,
8 and this includes both from a risk perspective and
9 regulatory perspective.

10 To bound this a little bit, I've done
11 both for Ginna Station. I created the original PRA
12 model and I did all the PRA work originally. I've
13 also done accident analysis work for Ginna. So I'd
14 like to provide a little perspective from that from
15 that you've heard.

16 The accident analysis discussions from
17 yesterday is really a regulatory focus. And those
18 are driven by establishing a limit, whether it DNBR
19 or pressurizer pressure or whatever it may be and
20 then running the code assuming that all non-safety
21 related items are maximized and utilized, whatever,
22 to maximize the effect on that. Let's say charging
23 flow, your spray control, that type of thing are
24 basically turned off if you're looking for DNB
25 parameters such that you want to force the computer

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1 code to assume that worse case conditions actually
2 happened.

3 MEMBER WALLIS: So this is no credit for
4 a non-safety related systems?

5 MR. FLAHERTY: Correct. In accident
6 analysis space since it's regulatory driven --

7 MEMBER WALLIS: Because in the real sort
8 of PRA type of space.

9 MR. FLAHERTY: Yes.

10 MEMBER WALLIS: I would hate to say PRA
11 is real, but in a more real space those things would
12 be available?

13 MR. FLAHERTY: Correct. And that's the
14 delta that I wanted to discuss a little bit, is that
15 from the accident analysis code if we're looking at
16 it for DNB, we'll assume that a pressurizer spray
17 does not work so that RCS pressure and temperature
18 goes to extreme and then challenges DNB. Okay. And
19 we also do not credit operator actions, per se.
20 We'll typically take a hit for a ten minute delay
21 for operator actions.

22 So looking at the EOP enhancements,
23 whatever else like that, most of those are driven by
24 the risk side of the house versus the regulatory
25 computer codes.

1 Well, the regulatory accident analysis
2 aspects did drive some modifications to the plant.
3 That's the main feedwater isolation drive which is
4 driven by steam line break. The content storage
5 tank level inventory. So running the accident
6 analysis computer codes did drive physical plant
7 modifications for the site.

8 MEMBER WALLIS: And then in one case
9 you didn't like the results, so you used a different
10 method.

11 MR. FLAHERTY: Well, I want to discuss
12 that a little bit also. And I'm going to use an
13 example here for feedline break in accident analysis
14 space, regulatory space. That the computer codes do
15 not address the cool down effect once you exposure
16 feeding. So once you expose the feeding, you're
17 going to get steaming effect out the break. The
18 computer code doesn't address that because you're
19 looking at DNB, and so therefore you want to
20 maximize the heatup of the primary system. So when
21 you start looking at this and we tried to simulate
22 this on a the simulator to reflect that, it becomes
23 very difficult because a simulator is going to show
24 that once you expose that line, you're going to get
25 the cool down effect. So from a regulatory

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1 perspective when you saw from yesterday the limits
2 that were very close or right at the DNB limits, in
3 many cases that's, you know besides the
4 conservatisms embedded in the code, is conservatisms
5 in the parameters, whatever else, as you're modeling
6 that.

7 On the opposite side from a PRA
8 perspective, you know your comment that PRA is not
9 real, whatever else, PRA does try to reflect what we
10 really think is going to happen. Okay? And so I've
11 avoiding the word "realism," but it tries to reflect
12 what we really think is going to happen.

13 MEMBER WALLIS: Yes, I think it would
14 say that I think it's an honest attempt to be as
15 really distinct as you can, but then you shouldn't
16 believe that it is totally realistic.

17 MR. FLAHERTY: You need both sides of
18 the equation. You need the regulatory or
19 deterministic side, but you also need a PRA to give
20 you the opposite perspective. And we did use the PRA
21 to optimize EOP actions. You know, it was
22 recognized that in the FR-H.1 procedures, as Roy
23 discussed this morning, we're putting a step early
24 up front that recognizes that hey if you know for a
25 fact that you've lost all preferred aux feedwater,

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1 jump immediately to standby aux feedwater rather
2 than trying to recover main feedwater, etcetera,
3 from the secondary side. So that's from the PRA
4 side helped drive that this was probably the
5 appropriate decision to make.

6 So hopefully that puts that in
7 perspective. I know we'll be discussing small break
8 LOCA and the boron precipitation at next month's
9 meeting, but I did want to explain that there are
10 two distinct sides that both us as the licensee and
11 the NRC we tried to recognize those and factor those
12 into the power uprate itself.

13 MEMBER WALLIS: Well, I think that sort
14 of level of perspective is very useful to this sort
15 of a Committee so we don't get lost in all the
16 details.

17 MR. FLAHERTY: Yes.

18 Now the next bullet discusses that no
19 safety issues were uncovered. And what I just
20 discussed I think hopefully reenforces that.

21 Comprehensive testing will be performed.
22 What I want to bring up for here is that I'm in
23 corporate offices in Annapolis. And the project team
24 itself, and especially operations came forward with
25 the proposed for the 30 percent trip test. And the

1 reasons as we were discussing this morning, is
2 primarily that they want to test a full integration
3 of all the systems. And so they came forward saying
4 that we want to do this. And they made that
5 presentation to site senior management and corporate
6 management and we agreed that, yes, that was the
7 appropriate decision to make and it came from the
8 operations and the project team as this is the right
9 thing to do.

10 So I wanted to emphasize that. And
11 then, you know, obviously discussions with the NRC
12 as part of the review and, hopefully, approval of
13 the project reenforced that, yes, this test
14 integration, whatever else like that, is the right
15 thing to do.

16 And then lastly, that Ginna safety and
17 reliability will be maintained throughout the plant
18 modifications, procedure changes and training. And
19 we heard this morning, you know you were asking some
20 questions. What happens for vibration if you start
21 seeing it, that type of thing. The station does
22 have established programs in place to deal with this
23 type of stuff. And they are going to be reenforced
24 as part of the power ascension testing.

25 For example, we have what's called an

1 IRT, an issue response team. And that's standard
2 practice within Constellation and implemented at
3 Ginna. And we utilize this process at all times,
4 but as with respect to power ascension testing if
5 vibration issues are identified in the field,
6 whether it's by operations or by the team doing
7 inspections or whatever it may be, it gets entered
8 in the corrective action process and then it gets
9 turned over to this IRT which is comprised of
10 knowledgeable SMEs dealing with this specific topic
11 And there is significant corporate oversight.

12 Now, the station probably --

13 MEMBER WALLIS: Corrective action
14 program doesn't have an enormous backlog of things?

15 MR. FLAHERTY: Well, that's what the
16 whole purpose of this IRT is, is that when an issue
17 of significant importance, as power ascension
18 testing and vibrations and whatever else it would
19 come out to be, it automatically gets dumped into an
20 IRT which is a part of the corrective action process
21 but immediately says this is a significant issue
22 that we are going to look at with a dedicated team,
23 the highest priority. And so operations,
24 engineering, whatever is involved with that and
25 there is significant corporate oversight.

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1 Now, the site doesn't like the last
2 aspect, you know, because corporate we can always
3 ask the questions and say what if, that type of
4 thing. But this is an established process that most
5 utilities actually implement.

6 So I guess that's all I would like to
7 say. And we appreciate the opportunity to meet and
8 discuss with you.

9 CHAIRMAN DENNING: Very good.

10 First, let me say I think that you guys
11 made excellent presentations from both sides of the
12 table here. And I'm not aware of any significant
13 issues that have come up of the discussions we've
14 heard today. Obviously, the role of the Subcommittee
15 is just to take information to the full Committee
16 and it's the full Committee that deliberates and
17 makes decisions.

18 As far as the next meeting is planned,
19 let's talk a little bit about that.

20 Ralph, how much time do we have set
21 aside for --

22 MR. CARUSO: We have three days at the
23 end of April to cover Beaver Valley and the open
24 items that are left with regard to Ginna, which are
25 small break LOCA, boron precipitation and long term

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1 cooling. And I think I had originally planned to do
2 Beaver Valley two days and then finish Ginna. So we
3 have a whole day allocated.

4 CHAIRMAN DENNING: I doubt that we need
5 a whole day. Is that your feeling?

6 MEMBER WALLIS: Why do we need two days
7 for Beaver Valley. I mean, we did this in about one
8 day.

9 MR. CARUSO: Well, Beaver Valley,
10 hopefully, will also do LOCA and long term cooling.

11 MEMBER WALLIS: They'll do everything.

12 CHAIRMAN DENNING: They'll do
13 everything.

14 MR. CARUSO: Everything.

15 MEMBER WALLIS: I think we need half a
16 day. Half a day will be fine. As long as everyone
17 has everything ready.

18 MR. CARUSO: Half a day for --

19 MEMBER WALLIS: For Ginna.

20 MR. CARUSO: For Ginna.

21 MEMBER WALLIS: To wrap up Ginna.

22 MR. CARUSO: Okay.

23 CHAIRMAN DENNING: Yes. And, Jack, so
24 you have any comments about that?

25 MEMBER SIEBER: I agree with you that

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1 both the licensee and the Staff have done a good job
2 in preparing the documents for the EPU and putting
3 together these presentations.

4 I asked a question yesterday that
5 perhaps I didn't ask it right, I still have a thing
6 that concerns me, and were I Dr. Kress I would take
7 a Magic Marker and write right on the screen so that
8 I could illustrate my point.

9 But when you're deciding operating
10 parameters and how you will set your tech specs, you
11 do an analysis and that describes in my way of
12 looking at it a series of limits. You can't let TH
13 go any higher than this, and Tavg can operate in
14 this band, and you can't get any lower than this in
15 that band. And then the plant folks describe where
16 they actually want to operate the plant, which is
17 usually somewhere in the middle of this box of
18 limits. So that as the plant undergoes transients
19 you don't hit a limit in the plant trips or you
20 don't close to some safety limit or something like
21 that.

22 And when I looked at that and in the
23 application I looked at this table of what the
24 limits really were, and one of this was T_{Hot} and it
25 was up around 617 degrees for the limit, and then I

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1 looked at your chart which you showed us yesterday
2 of where you planned to operate the plant and it was
3 something like 609, which is more modest and
4 probably in the ballpark with a lot of other PWRs
5 like this, but also hotter than where you're
6 operating today by 7 or 8 degrees. And my concern
7 was as soon as I saw that well there's nothing
8 stopping them from choosing a different set of
9 operating parameters and still staying within the
10 tech specs of running the plant at a higher
11 temperature. All the way up, perhaps to 617. And
12 then when you think about that you say, well what
13 materials are in the coolant system. And I asked
14 this question: Where are the locations of alloy 82,
15 182 or any instances of alloy 600 in the coolant
16 system. And, obviously, your steam generators are
17 changed. Nothing in the pressurizer from an
18 operating parameter standpoint changes because
19 you're operating at the same pressure. And so none
20 of that is EPU related. But I keep thinking of the
21 safe ends on the reactor vessel that weld to the
22 cast austenitic stainless steel piping. Some plants
23 had 82, 182 buttering in that area which in some
24 plants, but not all plants, was subject to augmented
25 inspection under Section 11 because of the

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1 susceptibility of that material to cracking.

2 And so I was trying to get some kind of
3 assurance that in the long run your normal operating
4 procedures, you're going to stay at or below 609 and
5 the susceptibility to cracking is just a couple of
6 degrees higher than that as opposed to getting the
7 bright day someday that I'm going to run my plant a
8 little hotter and be on the other side of it.

9 No one gave the description of where the
10 82/182 welds are, if they're used at all. Some
11 plants didn't use them. And I need assurance that
12 you're going to operate with the parameters that you
13 set out in your slide.

14 MR. DUNNE: Let me try and respond.
15 This is Jim Dunne.

16 One, I think there is an industry alloy
17 600 materials group out there forcing all the plants
18 to --

19 MEMBER SIEBER: Yes.

20 MR. DUNNE: -- sort of identify where
21 they have alloy 600 and how they're going to manage
22 it going forward.

23 Right now we believe that the only
24 places we have alloy 600 left in our RCS would be
25 basically in the cold leg region of the reactor

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1 vessel there's some locations --

2 MEMBER SIEBER: Yes, the water under the
3 vessel, those penetrations are often --

4 MR. DUNNE: Right. So we don't believe
5 we have alloy 600 anywhere in the T_{Hot} side of the
6 RCS at this point in time.

7 MEMBER SIEBER: What about the alloy 82,
8 182?

9 MR. DUNNE: I don't believe we have
10 alloy 82 for the --

11 MEMBER SIEBER: 182?

12 MR. DUNNE: I would need to confirm
13 that.

14 MEMBER SIEBER: Could you do that by the
15 next time we meet?

16 MR. DUNNE: Yes, we can probably --

17 MEMBER SIEBER: I'm only interest in the
18 hot leg.

19 MR. DUNNE: Right.

20 MEMBER SIEBER: Once you get to the
21 steam generator, beyond that, it's okay with me.

22 MR. DUNNE: And we do have a person who
23 is responsible for chasing all the alloy 600 around
24 as part of this industry, alloy 600 committee, and
25 we can talk to him and reconfirm that --

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1 MEMBER SIEBER: Well, I'm only
2 interested in what you're doing. You know, what the
3 industry does is something else.

4 MR. DUNNE: Right.

5 MEMBER SIEBER: So just tell me about
6 Ginna.

7 MR. DUNNE: Right. So I believe we
8 don't have any of the hot leg either for the weld
9 material for the alloy 600 material. But we can
10 confirm that and get back to you on that.

11 MEMBER SIEBER: Be sure you check things
12 like thermal welds.

13 MR. DUNNE: Right.

14 MEMBER SIEBER: Branch line connections,
15 fence and drains.

16 MR. DUNNE: Yes.

17 MEMBER SIEBER: And all the way up to
18 the hot leg of the steam generator, just that one
19 section of pipe.

20 CHAIRMAN DENNING: Okay. Well, let me
21 make a couple of comments about what I think we
22 want to make sure that we see at this next meeting.

23 As certainly the small break LOCA. My
24 guess is that we're not going to need much time on
25 that from what I'm hearing.

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1 The boron precipitation is the type of
2 thing that we tend to get a little wild over. So I
3 think you ought to figure that we're going to spend
4 some time and ask questions that you're probably not
5 going to be able to answer in that area.

6 Jack's comments.

7 I'd like to see a little more discussion
8 on a couple of these limiting accidents with the
9 regulatory type of analyses. And perhaps one of them
10 might be the loss-of-external-electrical load and
11 another might be the flow coastdown accident,
12 although we've talked a little bit about both of
13 those. I think as far as kind of walking us through
14 those might be good examples.

15 If you also had more realistic analyses,
16 too, that gave us a feeling as to what was there. I
17 realize that you may not in those cases be able to
18 do that.

19 So that's kind of the things that I
20 think we ought to be sure that we cover at this
21 time.

22 Otto, do you have anything that you'd
23 like to say or comments you'd like to make? I
24 haven't given you a chance.

25 MEMBER MAYNARD: I agree that the

1 presentations I think were very thorough and very
2 good.

3 I think that it would be good to discuss
4 a couple of these just to show the level of
5 conservatism and why coming close to the limits is
6 safe. I don't have a problem with it. The public
7 and regulatory margins build into the acceptance
8 criteria and into the acceptance of the approved
9 methodologies, but I don't think in this meeting
10 very good discussion that gave anybody a level of
11 confidence that hitting that limit was okay. So I
12 think we could have some better discussion in that
13 and perhaps go through an example or so.

14 But overall, I thought very good
15 presentations and good review.

16 CHAIRMAN DENNING: Graham, anything
17 else?

18 MEMBER WALLIS: Well, as I said earlier,
19 I think the safety analysis is really the key topic.
20 We're here to talk about reactor safety and not a
21 lot of details, and that was given a rather short
22 shrift in this meeting.

23 What I would like to see is this table.
24 Now where does this table come from that was handed
25 out? Is this from applicant?

1 MR. MILANO: The licensing report, yes.

2 MEMBER WALLIS: Form the applicant?

3 MR. MILANO: Yes.

4 MEMBER WALLIS: It's not in the SER?

5 Because when I read the SER, I don't get these
6 numbers and I have no idea of the basis for your
7 decisions. I think they should be there.

8 Now, what I would like to see is the
9 comparison of the type that the licensee presented
10 here of the most interesting situations along with
11 the Chairman here where you're pushing the envelop.
12 Because I tried this on another member of the
13 Committee and he said it would be a red flag to him
14 if he saw these numbers so close to the limit. He'd
15 want to know why and what's being done about it and
16 how the Staff satisfied themselves that that's okay.

17 So I'd like to see a table like that.
18 It's just the basic information.

19 And I'd like to see where you are today
20 before the uprate. I mean if you're at 3193 psig
21 after the uprate, where were you before? What's the
22 consequence of the uprate? We don't have any
23 perspective of what's changed because of the uprate.

24 I have a very specific technical
25 question here. You present the criteria and the

1 result and say reactivity in addition to rod
2 withdrawal in terms of psia. Now, what you measure
3 is psig and the atmospheric pressure itself is
4 uncertain within ten percent. If I take that
5 uncertainty in atmospheric pressure, then I cannot
6 convince myself that 2748.1 is less than 2748.5.
7 Atmospheric pressure varies by, in the extreme case
8 of hurricanes and so on, ten percent or so.

9 CHAIRMAN DENNING: Not in RETRAN it
10 doesn't.

11 MEMBER WALLIS: But it does. And what
12 you measure is -- so could you -- and when you're as
13 close as that, you're within -- you don't really
14 ever measure psia. And I don't know what RETRAN is.
15 RETRAN assumes a certain standard atmosphere or
16 something?

17 CHAIRMAN DENNING: Yes.

18 MEMBER WALLIS: Okay. Well, that's a
19 point. But I'm mystified by having a criteria in
20 psia. When they're actually running the plant, you
21 presumably measure psig or do you always correct for
22 atmospheric pressure variations? I don't think you
23 do.

24 CHAIRMAN DENNING: You don't have to
25 answer that right now.

1 MEMBER WALLIS: Yes. But that is a
2 peculiarity I noticed.

3 Anyway, the thing is the overview is
4 important, especially for the full Committee. So
5 before the uprate, here were the parameters in
6 safety and here was the state of the plant in this
7 n-dimensional regulatory box. And when they changed
8 and they've had the uprate, they stretched this n-
9 dimensional space they're in and they bump up
10 against some limits. And make it clear what those
11 limits are they're bumping up against. And then give
12 some examples of how you satisfied yourselves that
13 it was okay and what you did to satisfy yourself.
14 But the number wasn't sort of ten percent one way or
15 the other or something. That they've done an honest
16 job of getting so very close to the limit.

17 And also, I think the accuracy of this
18 is suspect, too. I mean, when you look at one part
19 in 10,000 accuracy, especially on pressure, it's
20 still dubious.

21 So that's really the main point I had.
22 And when you get to the main Committee, and maybe
23 you can come back to the Subcommittee meeting as a
24 sort of a rehearsal for the full Committee meeting.

25 MR. MILANO: That was our expectations.

1 We were going to right now -- and again, this is
2 preliminary and I'll discuss more of it with Mr.
3 Caruso before we go there, but our plans were for
4 the NRR staff to at least go through three different
5 scenarios of our reviews, one being the normal
6 approach that we'd take. When I say "normal," I
7 mean the typical approach wherein we review
8 methodologies, modeling, assumptions, assumption
9 inputs and the outputs. One where we do that plus do
10 independent audits. And then a third one where we do
11 our independent calculations.

12 MEMBER WALLIS: Yes.

13 MR. MILANO: And you'll see the
14 independent calculations more so when we talk about
15 small break LOCA because we've been doing some
16 extensive stuff in that and boron precipitation. So
17 that was our plans during the next Subcommittee
18 meeting was to go through three of those.

19 MEMBER WALLIS: Good. I didn't see this
20 before I came here. This job with these numbers.
21 Because the way things worked out I had a day to
22 look at everything I was given. And I look at the
23 SER. I mean I supposed to be the decision making
24 thing. And I look at that. And if it doesn't give
25 me these numbers, I have no idea what they are. I'm

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1 not going to go back and dig out something out of
2 the application. I don't have the time to do that,
3 and I assume that you've done it. But if you don't
4 tell me in the SER -- I got very frustrated, I must
5 say, reading that in the SER and trying to figure
6 out what had happened to these various parameters.

7 Anyway, that's by the way.

8 CHAIRMAN DENNING: I think there is kind
9 of a generic question here of what really should be
10 in an SER and we're not kind of in that regulatory
11 space as much as we are in some technical review,
12 and maybe there really is a difference as to what
13 really ought to be in the SER. But, you know, for us
14 it really is frustrating not to see numbers. We're
15 very number oriented.

16 MEMBER SIEBER: I think the Staff
17 sometimes tends to use an approved methodology and
18 set of codes rather than go through again the basis
19 upon which that approval was granted in the past,
20 they just reference the document of some SE
21 someplace. And that's a shortcut, but that gives us
22 more work sometimes in mystery land as to where some
23 of these things come from.

24 I'm not sure what the solution to that
25 really is, but I'm sure that it will evolve from our

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1 discussions.

2 CHAIRMAN DENNING: Any last questions by
3 either side? No.

4 Thank you very much. And we're
5 adjourned.

6 (Whereupon, at 9:52 a.m. the
7 Subcommittee was adjourned.)

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CERTIFICATE

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

Name of Proceeding: Advisory Committee on
Reactor Safeguards

Subcommittee on Power Upgrades

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.



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